

Abstract Book



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Panel Session**201 - Innovative Approaches to Increase Employment Rates for Autistic Transition Age Youth and Young Adults**

May 1st, 2025, 10:30 AM - 12:30 PM - 6B

Panel Chair: Marjorie Solomon, *Department of Psychiatry and Behavioral Sciences, UC Davis MIND Institute, Sacramento, CA***Discussant: Julie Taylor**, *Department of General Pediatrics, Vanderbilt University Medical Center, Nashville, TN*

Autistic adults' employment rates remain extremely low, posing a clinically significant problem given the benefits of employment for well-being, independence and life satisfaction in all adults. We present integrative cross-disciplinary strategies to improve employment outcomes in autistic individuals. Dr. Brianne Tomaszewski will present findings from a clinical trial of the TEACCH Autism Program, School Transition to Employment and Postsecondary Education Program (T-STEP), a community college-based transition program for autistic students that includes self-determination and executive function training, counseling and an internship. Dr. Matthew Smith will then discuss a Hybrid Type I trial of the effectiveness, feasibility, and acceptability of a virtual workplace communication training platform (WorkChat) developed with members of the autistic community and implemented in 4 post-secondary pre-employment transition services. Dr. Ben Schwartzman will discuss his study of a parent mentorship program to assist parents in connecting their adult autistic and/or intellectual disabled family members with paid employment. Finally, Dr. Marjorie Solomon will present results of a Hybrid Type 1 effectiveness trial examining employment outcomes, and feasibility and acceptability of the highly validated Individualized Placement and Support (IPS) model –which has been used extensively and successfully in the severe mental illness field –implemented in autistic adults in the community

Discussion

J. L. Taylor, *Department of General Pediatrics, Vanderbilt University Medical Center, Nashville, TN*

Introduction

M. Solomon, *Department of Psychiatry and Behavioral Sciences, UC Davis School of Medicine, Department of Psychiatry, MIND Institute, Sacramento, CA*

201.001 Examining Moderators and Maintenance Effects of a Transition Intervention for Autistic Adolescents and Young Adults
B. Tomaszewski¹, **E. M. Lamarche**², **M. Cook**³, **C. B. Klein**⁴, **T. D. Marsh**⁵, **B. W. Kiernan**⁶, **G. M. Osborne**⁷ and **L. G. Klinger**²,
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Background: The TEACCH School Transition to Employment and Postsecondary Education (T-STEP) is a 12-week community college program that supports transition-aged autistic youth in pursuing their individualized goals for a successful adult life. The T-STEP has three components. For each week: (1) class focused on self-determination, executive function, professional social skills, and coping skills; (2) internship; and (3) counseling sessions focused on self-advocacy, career counseling, and disability services. In a comparative efficacy trial, students received either three components (Comprehensive T-STEP) or the counseling component (Counseling). Students in the Comprehensive T-STEP reported more significant gains in self-determination and coping skills compared to students in the Counseling group. Parents reported increases in both groups for self-determination and executive function (Tomaszewski et al., 2024).

Objectives: The objectives of the current study were to (1) examine the maintenance effects of the comprehensive T-STEP and Counseling programs at a 3-month follow-up timepoint and (2) examine moderators of the comprehensive T-STEP and Counseling groups to identify characteristics of adolescents and young adults (e.g., IQ, autism characteristics, anxiety) who benefited most from the two programs.

Methods: 110 autistic adolescents and young adults ages 16-21 ($M=18.21$, $SD=1.32$) with $IQ \geq 80$ ($M=107.72$, $SD=15.32$) were randomly assigned to complete the 12-week (Comprehensive T-STEP($N=58$) or Counseling($N=52$)). During the pre-test, an IQ test was performed(WASI-II), and caregivers completed a measure of autism characteristics(SRS-2). During the pre-test, post-test, and 3-month follow-up, autistic students completed measures of self-determination(AIR-SDS), coping skills(Coping Self-Efficacy Scale), anxiety(State-Trait Anxiety), and depression(CESD-R). Caregivers completed measures of self-determination and executive function(BRIEF). Linear mixed models examined moderators of IQ, autism characteristics, and anxiety on the outcomes for the Comprehensive T-STEP and Counseling groups and outcomes over the three- time points.

Results: Students in the Comprehensive T-STEP maintained their gains in self-determination and coping skills compared to students in the counseling group. Autism characteristics significantly moderated treatment effects between Comprehensive T-STEP and Counseling on student-reported depression, $F(2,8) = 3.22$, $p = .04$ and parent-reported executive function, $F(5,110) = 2.37$, $p = .04$. While no average treatment effects were found from pre-test to post-test, autistic students with average (T-Score=68) and high (T-Score = 77) SRS-2 scores in the Comprehensive T-STEP reported decreases in depression from pre-test to follow-up. Individuals in the Comprehensive T-STEP maintained their gains in executive function skills from the pre-test to follow-up across all SRS-2 scores. Individuals in the Counseling group maintained their gains if their SRS-2 scores were low or average but not if they were high. Moderation of anxiety and IQ on parent self-determination will be discussed. No moderators were found for student-reported self-determination or coping skills.

Conclusions: Students receiving the Comprehensive T-STEP maintained their gains in self-determination and coping skills three months after completing the program. Autism characteristics were a moderator. This analysis suggests that the Comprehensive T-STEP may work best for students with more autism characteristics, and students in the Counseling group may work best for students with less autism characteristics. Findings highlight the need for individualized approaches to interventions for autistic students.



201.002 Initial Findings from a Hybrid Type I RCT of Workchat: A Virtual Workday for Autistic Transition-Age Youth Delivered in Pre-Employment Transition Services

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Background: Workplace conversations may be challenging for autistic transition-age youth who may use more direct communication styles or commonly experience social anxiety. Moreover, 90% of job dismissals among autistic transition-age youth have been attributed to workplace communication challenges. Notably, the field lacks evidence-based practices to support workplace conversations. Thus, our team partnered with 44 autistic youth and adults, 10 vocational counselors, and community, diversity, and scientific advisory boards to develop “WorkChat: A Virtual Workday.” WorkChat is a safe virtual space where trainees practice talking with virtual customers, coworkers, and supervisors (depicted by actors) with varying personalities and needs. WorkChat provides four levels of automated feedback to help enhance workplace conversational skill.

Objectives: To conduct a randomized controlled trial to evaluate whether WorkChat improves conversational skills, social cognitive ability, and social anxiety beyond services-as-usual (SAU).

Methods: We partnered with four post-secondary pre-employment transition services programs where staff implemented WorkChat. Autism was validated with individualized education programs or a standardized assessment. We measured outcomes via live role-plays, social cognitive assessments and self-report measures (validated among autistic people). We conducted repeated measures analysis of variance with partial eta-squared (η^2p) effect sizes to compare the group-by-time interaction among SAU with WorkChat (SAU+WorkChat) with SAU only.

Results: To date, forty-four participants (ages 18 to 26) were randomized to SAU+WorkChat or SAU only and completed pre-test and post-test assessments. The sample identified as 75% male, 21% female, 4% preferred not to answer. We found significant group-by-time interactions, characterized by large effect sizes suggesting that SAU+WorkChat, as compared to SAU, improved their emotional management ($p=.021$, $\eta^2p=.17$) and their anxiety about conversations with others ($p=.004$, $\eta^2p=.21$). WorkChat was not associated with improvements in social perception and theory-of-mind (both $p>.10$, and $\eta^2p<.04$). Role-play data were completely processed (to date) for 19 of 44 participants with SAU+WorkChat, compared to SAU, showing a significant interaction and a large effect size improvement in conversational skill with supervisors ($p=.02$, $\eta^2p=.31$), while trend-level significance and large effect sizes for conversations with customers ($p=.07$, $\eta^2p=.22$) and coworkers ($p=.06$, $\eta^2p=.22$).

Conclusions: Our preliminary results suggest WorkChat may be contributing to improvements in emotional management, social anxiety, and work-based conversational skills. Within the context of work, the need to regulate one’s emotions and anxiety during professional encounters (e.g., helping an upset customer or getting supervisor feedback) is critical to sustaining employment. Moreover, autistic transition-age youth commonly experience social anxiety and the exposure to virtual customers, coworkers, and supervisors through WorkChat could support their future comfort when having real-world conversations at work. Notably, the results must be interpreted within the context of study limitations such as small sample size and require replication.

201.003 Effects of a Parent-to-Parent Mentorship Intervention on the Competitive Integrated Employment Outcomes of Adults with Autism and/or Intellectual Disability

B. Schwartzman, Vanderbilt University, Nashville, TN

Background: The vast majority of adults with intellectual and developmental disabilities (IDD) aspire to find paid work in their communities (National Core Indicators, 2021). Yet, employment rates for adults with IDD have remained below 20% despite concerted policy, advocacy, and funding initiatives (Windsor et al., 2021). Additionally, the adult services system is fraught with fragmentation in that there are often socioeconomic disparities in which geographic areas have access to certain employment services and how programs are implemented (Shogren & Wittenburg, 2020). Due to the dearth of available services, the majority of adults with IDD continue to reside with their families as they age into older adulthood (Burke et al., 2021). Thus, it is essential to engage families in the pursuit of employment (Kamau & Timmons, 2018), as parent expectations are among the most robust predictors of future employment for individuals with IDD (Wehman et al., 2015).

Objectives: Our goal was to develop, pilot, and evaluate a parent-to-parent mentorship intervention where parents of employed adults with IDD serve as mentors for parents of unemployed adults with IDD.

Methods: After interviewing 60 parents of adults with IDD to inform the design of the intervention, we piloted our novel parent-to-parent mentorship model by pairing five parents of unemployed adults with IDD (mentees) to five parents of employed adults with IDD (mentors). We further evaluated the intervention in an RCT ($n=55$) where intervention parents ($n=25$) were paired with a mentor for 12 months, while control group parents ($n=30$) received services as usual for 12 months without being paired with a mentor. Of the 55 parents, 35% had children with ASD, 31% with ASD+ID, 21% with ID, and 13% with Down Syndrome; 74% were White, 18% Black, 5% Hispanic/Latino, and 2% Native American. Prior to being randomized, all participants received a “Roadmap to Employment” guide we created and attended four Zoom classes which covered employment best practices for adults with IDD. We collected parent-report data on employment outcomes, how prepared parents felt to navigate the employment process pre- and post-intervention, parent stress, and feedback about the intervention.

Results: Parents who were paired with a mentor (intervention group; $n = 25$) reported feeling better prepared for employment ($p < .05$), experiencing less stress ($p < .05$), and their adult children with IDD experienced improved CIE outcomes, as compared to control group parents ($n=30$). In examining employment outcomes, we conducted a chi-square test and determined that the employment rates of the intervention group (68% employed) were significantly higher than those in the comparison group (37% employed) $\chi^2(1, N = 55) = 5.4$, $p = .02$. Additionally, all participating families, both in the intervention and comparison groups, shared primarily positive feedback on their experiences participating in the project.

Conclusions: These findings indicate that the practical information and materials we provided to all families contributed to some improvement in employment preparedness and employment outcomes. Evidenced by intervention group outcomes, mentorship may provide families with an additional boost of support in connecting their family members to employment.

201.004 Enhancing Competitive Integrated Employment for Autistic Adults: Barriers, Facilitators, and the Potential of the Individualized Placement and Support (IPS) Model

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Background: Less than 20% of autistic individuals in the U.S. achieve Competitive Integrated Employment (CIE) (Annual Disability Statistics Compendium), yet research on supported employment services for them remains limited. The Individualized Placement and Support (IPS) model is well-established for individuals with severe mental illness (28 RCTs) (Drake & Bond, 2023). Key IPS principles include a focus on CIE, zero exclusion to employment, integrating mental and employment services, client-driven rapid job search (no internships), having the same employment specialist (ESs) handle job development (6-employer contacts/week), coaching and long-term support, and fidelity assessment at 6- and 12-months to evaluate adherence to IPS model. In the first trial (n=5) of autistic adults in a hospital setting, 100% obtained employment (McClaren et al., 2017). A follow-up community-based trial achieved 36% employment after 1 year (Noel et al., 2018).

Objectives: To test the feasibility, acceptability, and employment outcomes of IPS among California Department of Developmental Services (DDS) providers, informing the adaptation of the IPS model for autistic adults with and/or without ID.

Methods: Four community agencies participated in IPS training with ongoing weekly consultations, and site visits. Fidelity was assessed at 6- and 12-months. We enrolled 21 clients (13M, 8F), aged 20-52, (M=30, SD=19) with autism (with/without ID; n=17) or ID-only (n=4) with Verbal-IQs 59-132 (M=97, SD=19) who were 62% White, 14% Black, 10% Hispanic/Latino, and 14% Mixed Race. Employment outcomes were tracked. Focus groups with clients (n=13), caregivers (n=4), ESs (n=4), and supervisors (n=6) identified barriers and facilitators to IPS adaptation. Community-informed guidelines ensured focus group relevance. Data were analyzed using Rapid Assessment Procedures (McNall & Foster-Fishman, 2007), including thematic analysis by independent coders using Dedoose™.

Results: There was 75% agency and 100% client retention at 12-months. Eleven CIE placements were made (52% success), with 80% retaining employment for ≥6-months. At 6-months, 3 agencies had fair fidelity (1 did not meet criteria). By 12-months, 1 agency achieved good fidelity, 1 maintained fair fidelity, 1 still failed, and 1 withdrew. Common barriers to implementation included staff turnover and IPS discouragement of the use of internships (Table 1). Clients reported gaining job skills and confidence but noted some job mismatch and inadequate on-the-job supports. Parents expressed concern their children were overqualified for some job placements, although they reported learning to work effectively with ESs and helping their children self-advocate. They mentioned the utility of parent-to-parent mentorship. ESs felt IPS strengthened their relationships with consumers; they liked going out into the community to develop jobs but found the 6-contacts/week requirement challenging. ESs and supervisors highlighted inadequate training for fidelity reviews. Supervisors also cited large caseloads, combining the development and coach roles, and required duration of employment supports as barriers.

Conclusions: IPS shows potential to improve employment outcomes for autistic individuals. In adapting the model, we will be soliciting additional community input on reconsidering the use of internships, better preparing and training ESs and agencies, parent to parent mentoring, and assisting agencies in job development. Work with the Department of Rehabilitation and DDS about sustainable funding is ongoing.



Panel Session

202 - Key Factors for Data-Driven Approaches to Identifying Neuroanatomical Subgroups: Exploring Mechanisms, Validation and Clinical Relevance

May 1st, 2025, 10:30 AM - 12:30 PM - 6C

Panel Chair: Eva Loth, Department of Forensic and Neurodevelopmental Sciences, Flat 2, 116, South Hill Park, London, London, United Kingdom

Discussant: Evdokia Anagnostou, Bloorview Research Institute, Holland Bloorview Kids Rehabilitation Hospital, Toronto, ON, Canada

Current diagnostic categories in neurodevelopmental conditions are limited in predicting developmental paths, support needs, or treatment responses due to the wide clinical and biological diversity within and between conditions. This has prompted the need for identifying subgroups based on shared biological characteristics. Our panel will explore key questions for data-driven and transdiagnostic approaches to identifying and/ or validating subgroups using structural MRI. The first presentation adopts a transdiagnostic approach, examining the replicability of clustering structures in two independent cohorts of participants with autism, ADHD, OCD or neurotypical development. Next, we integrate neuroimaging and transcriptomics to examine whether brain anatomy-

based subgroups may be linked to specific molecular pathways implicated in autism aetiology by genomic investigations. The third presentation applies density-based clustering to a novel touch screen battery to identify neurocognitive subgroups in autistic and non-autistic preschoolers. Neurocognitive subgroups were then externally validated against clinical features and brain anatomy. Finally, we use deep-learning to explore whether brain-based subgrouping predicts internalising problems in neurotypical and neurodivergent young people, both cross-sectionally and longitudinally. We will close by discussing the need for benchmarks for validation and clinical relevance and consider ethical implications of bringing these subgrouping approaches into the clinic.

Introduction

E. Loth, *Department of Forensic and Neurodevelopmental Sciences, Flat 2, 116, South Hill Park, London, United Kingdom*

202.001 Replicability of Clustering Results Based on Brain Morphology

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Background: There is significant heterogeneity within neurodevelopmental conditions and large overlap across conditions. This necessitate a shift from case-control designs to data-driven approaches that do not make a priori assumptions about groupings of individuals. As a result, clustering has gained attention for characterizing heterogeneity in neurodevelopmental conditions. Despite the success of clustering approaches, however, concerns have been raised around the replicability of clustering results.

Objectives: To examine the replicability of clustering results based measures of brain morphology in samples of neurodiverse children.

Methods: Replicability of clustering was examined using two independent datasets, namely the Province of Ontario Neurodevelopmental Disorder (POND) Network and the Healthy Brain Network (HBN). POND and HBN data were collected across various institutions in Ontario, Canada, and New York, United States, respectively. Participants were included who were 5-19 years old and had diagnoses of autism, attention deficit/hyperactivity disorder (ADHD), obsessive compulsive disorder (OCD), or were neurotypical. Measures of cortical volume, surface area, cortical thickness, and subgroup volume extracted from structural MRI data were used. Principal component analysis (PCA) and clustering were used to examine the replicability of clustering structures across the datasets. Correlations among principle components, measures of clusterability, and alignment between the four brain measures as well as male/female subsets were examined. Brain-behaviour associations were examined using univariate and multivariate approaches.

Results: 747 and 582 participants were included for POND and HBN, respectively (POND: autism n=312, ADHD n=220, OCD n=70, neurotypical n=145; HBN: autism n=60, ADHD n=445, OCD n=19, neurotypical n=58). Significant between-dataset correlations were found in 82.1% of the principal components derived from brain measures. Across datasets and brain measures a two-cluster structure was replicated. The participant composition of clusters was closely matched between cortical volume and surface area, and cortical thickness and subcortical volume. Data-driven clusters were not aligned with diagnostic labels across datasets. Brain-behaviour associations were only replicated for male subsets and subcortical volume using multivariate analysis.

Conclusions: Our results supported the replicability of data structures and clustering results across two independent datasets for individual measures of brain morphology; however, clustering results did not replicate across all brain measures.

202.002 Parsing Autism Heterogeneity: Transcriptomic Subgrouping of Imaging-Derived Phenotypes in Autism

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Background:

Neurodevelopmental conditions, such as autism, are highly heterogeneous both at the causative and phenotypic level. Parsing heterogeneity is therefore vital for uncovering underlying mechanisms that could inform the development of targeted, i.e., personalized support. While the neuroanatomy of autism is highly diverse across individuals, imaging transcriptomics studies suggests that imaging-derived phenotypes (IDPs) in autism may be linked to specific molecular mechanisms and pathways that have been implicated in autism aetiology by genomic investigations. There is thus now an opportunity to subgroup autism both on the neuroanatomical and transcriptomic level, and so to provide biologically informed subgroups that converge onto distinct molecular aetiologies.

Objectives:

Our study aims to subgroup individuals on the autism spectrum to identify subgroups that converge at both mechanistic and phenotypic level.

Methods:

We employed an imaging transcriptomics approach to link individual neuroanatomical imaging-derived phenotypes (IDPs) in autism to gene expression signatures by means of the Allen Human Brain Atlas. Data was provided by the EU-AIMS Longitudinal European Autism Project, one of the largest multicentered case-control cohorts on autism worldwide. The total sample consisted of N=279 individuals with autism and N=359 non-autistic participants aged 6-30 years (both males and females). Inclusion of autistic participants required an existing diagnosis of autism according to DSM-IV/V or ICD-10 criteria. Autistic participants with co-occurring psychiatric conditions, except psychosis and bipolar disorder, and on regular medication were included. Individuals were subdivided using clustering techniques based on similarities in their IDP-associated transcriptomic profiles, and subsequently linked to clinical and neuroanatomical measures, i.e., cortical thickness.

Results:

We identified three robust subgroups of individuals with autism, each characterized by similar IDP-related transcriptomic signatures. These subgroups aligned with distinct clinical phenotypes, whereby individuals with the strongest transcriptomic associations were the least affected on the level of symptomatology. The subgroups also differed on the level of neuroanatomy, i.e., cortical thickness differed between subgroups in the frontal and cingulate cortex. The gene sets most characteristic for each subgroup were significantly enriched for genes previously implicated in autism aetiology by genetic and transcriptomic investigations, many of which regulate typical brain development.

Conclusions:

Individuals with autism can be stratified based on the transcriptomic signatures associated with their neuroanatomical fingerprints, revealing subgroups that also align with distinct clinical phenotypes. Our study thus provides a novel analytical framework for linking neurodevelopmental and clinical diversity in autism to underlying molecular mechanisms, thus providing the foundations for the future development of personalized support strategies.



202.003 Density-Based Robust Clustering Identifies a Distinct Neurocognitive Profile in a Subgroup of Autistic Preschoolers Linked to ADHD Features and Neuroanatomical Differences

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Background:

Autism frequently co-occurs with Attention Deficit Hyperactivity Disorder (ADHD), which significantly impacts developmental outcomes, quality of life, and adaptive functioning (1,2). However, early and reliable markers of ADHD traits in autistic individuals have not yet been identified. While differences in neurocognitive domains such as executive functioning (EF) and reward processing have been reported separately in some autistic children and children with ADHD (4,5), these domains are typically studied in isolation. Furthermore, research was limited mostly to middle childhood and adolescence. It is essential to assess whether parsing variability in composite neurocognitive profiles can help to identify clinically and neuroanatomically distinct subgroups of autistic preschool children.

Objectives:

To identify cross-domain neurocognitive profiles using a clustering approach and to validate neurocognitive subgroups against clinical features, and brain anatomy in the EF and reward networks.

Methods:

This study utilised data from a well-characterised cohort of 98 autistic and 142 typically developing preschoolers aged 34-54 months who participated in the Preschool Brain Imaging and Behaviour Project. A sub-sample of 80 children also provided structural MRI data. Primary and secondary dependent variables were derived from a touchscreen battery that included inhibitory control, sustained attention and reward learning tasks. We entered these in-model variables into a density-based clustering algorithm and subsequently, we compared the emergent subgroups on clinical features, including the ADHD Rating Scale–Preschool Version, Social Responsiveness Scale-2, Strengths and Difficulties Questionnaire and Sensory Experiences Questionnaire, as well as on neuroanatomical features, mainly surface area and cortical thickness.

Results:

We identified four distinct subgroups, with two subgroups enriched for neurodivergence (Subgroup 1 & 3). Subgroup 1 exhibited difficulties across all neurocognitive domains (inhibitory control, sustained attention, reward learning) and had significantly elevated ADHD traits despite typical IQ (see Figure 1A-C). Subgroup 3 showed intermediate ADHD traits, struggled with task completion, and had low IQ. Both subgroups also demonstrated higher levels of social difficulties ($\eta^2=0.11$) and behavioral problems ($\eta^2=0.09$) compared to Subgroups 2 and 4, which exhibited typical neurocognitive performance and low ADHD traits (for subgroup characterization details, see Table 1). Neuroanatomical comparisons revealed widespread surface area differences across frontal and parietal regions (see Figure 1), with additional orbitofrontal cortex alterations in both Subgroup 1 and 3.

Conclusions:

Our findings indicated that brain-based neurocognitive subtypes, derived from a scalable tool, could be used to parse clinical heterogeneity in autistic and non-autistic preschoolers. Children who exhibited high ADHD traits may manifest either cognitive challenges in EF and reward processing, or more pervasive cognitive difficulties accompanied by low IQ. Impairments in these neurocognitive domains were linked to greater social difficulties, behavioral problems, and have distinct neuroanatomical correlates. Identifying unique profiles that aligned with behavioral symptoms at age 3 could allow clinicians to predict the likelihood of ADHD in autism and facilitate early personalized interventions, such as targeted cognitive training. Future longitudinal analysis will assess whether these profiles have predictive value for identifying autistic preschoolers who will develop ADHD.

**202.004 Predicting Internalizing Problems from Measures of Brain Structure: A Deep Learning Study**

M. M. Vandewouw¹, B. Syed², E. Kelley³, J. Jones⁴, M. Ayub⁴, P. Arnold⁵, J. Crosbie⁶, A. Iaboni⁷, R. Schachar⁸, M. J. Taylor⁹, J. P. Lerch¹⁰, E. Anagnostou¹¹ and A. Kushki¹, (1)Bloorview Research Institute, Autism Research Centre, Holland Bloorview Kids Rehabilitation Hospital, Toronto, ON, Canada, (2)Hospital for Sick Children, Toronto, ON, Canada, (3)Department of Psychology, Queen's University, Kingston, ON, Canada, (4)Department of Psychiatry, Queen's University, Kingston, ON, Canada, (5)University of Calgary, Calgary, AB, Canada, (6)University of Toronto, Toronto, ON, Canada, (7)Autism Research Centre, Bloorview Research Institute, Holland Bloorview Kids Rehabilitation Hospital, Toronto, ON, Canada, (8)Department of Psychiatry, The Hospital for Sick Children, Toronto, ON, Canada, (9)Diagnostic & Interventional Radiology, Hospital for Sick Children, Toronto, ON, Canada, (10)Wellcome Centre for Integrative Neuroimaging, University of Oxford, Oxford, ON, United Kingdom, (11)Bloorview Research Institute, Holland Bloorview Kids Rehabilitation Hospital, Toronto, ON, Canada

Background: Children and youth experiencing internalizing problems, such as anxiety and depression, often experience adverse outcomes. Although we have identified certain risk factors for internalizing problems, such as neurodiversity, the neurobiological markers are not well understood. Studies investigating the potential of brain structure to predict internalizing problems in neurodiverse youth have yielded inconsistent results, largely due to methods that may not fully capture the complex and multi-dimensional associations between neurobiology and mental health.

Objectives: This study aimed to predict both cross-sectional ($N=14,523$) and worsening trajectories ($N=10,540$) of internalizing problems in neurotypical and neurodivergent youth using deep learning.

Methods: Data were sourced from four datasets: (1) the Adolescent Brain Cognitive Development study, (2) the Healthy Brain Network, (3) the Human Connectome Project Development study, and (4) the Province of Ontario Neurodevelopmental network. Structural brain data were extracted from magnetic resonance images, and internalizing problems were measured using the Child Behaviour Checklist. Deep learning models were tuned, trained, and tested using a stratified cross-validation scheme. In one model, clinically significant internalizing problems were predicted cross-sectionally, and in another model, worsening trajectories of internalizing problems were predicted longitudinally (approximately two years later). Performance was evaluated using the area under the receiving operating characteristic curve (AUC).

Results: The cross-sectional model showed strong performance ($AUC = 0.80$ [95% CI: 0.71, 0.88]). Predicting worsening trajectories in the general population yielded sub-optimal results ($AUC=0.66$ [0.65, 0.67]). However, acceptable performance was reached in a small, external test set consisting primarily of neurodiverse children and youth ($AUC=0.80$ [0.78, 0.81]), as well as across all participants with a neurodevelopmental condition ($AUC=0.73$ [0.70, 0.76]).

Conclusions: This work demonstrates the potential of precision health approaches to mental health, where outcomes are predicted using an individual's neurobiology, especially for neurodiverse children and youth.

Panel Session

203 - Expanding Research Opportunities for Individuals with Profound Autism

May 1st, 2025, 10:30 AM - 12:30 PM - 6A

Panel Chair: Alison Singer, Autism Science Foundation, New York, NY

The Lancet Commission first defined “profound autism” in 2021 and stated that the new term was critical to distinguish people with high dependency needs from the more verbally and intellectually able population of people with autism. The Lancet described those with “profound autism” as having IQ under 50, being nonverbal or minimally verbal, being at least 8 years old, and requiring 24/7 supervision to maintain safety. The commission expressed hope that the introduction of the term “profound autism” would spur research to prioritize the needs of this vulnerable and underserved population. Since that time, many labs have conducted and published research on profound autism. Many of these groups have revised, added to, or removed elements from the Lancet definition, making it challenging to compare study results or link datasets. The purpose of this panel is to review options for a global consensus research definition of profound autism and invite attendees to discuss the pros and cons of various options.

Introduction

A. T. Singer, Autism Science Foundation, New York, NY

203.001 Developing a Consensus-Based Global Research Definition of Profound Autism

C. Lord¹, **H. Tager-Flusberg**², **M. Siegel**³, **A. Halladay**⁴, **J. Ursitti**⁵ and **A. T. Singer**⁴, (1)UCLA Semel Institute for Neuroscience and Human Behavior, Los Angeles, CA, (2)Psychological and Brain Sciences, Boston University, Boston, MA, (3)Boston Childrens Hospital, Boston, MA, (4)Autism Science Foundation, New York, NY, (5)Profound Autism Alliance, Boston, MA

Background: The Lancet Commission on Autism first defined “Profound Autism” in 2021 as an administrative term to describe people with autism who had IQ under 50, who were nonverbal or minimally verbal, were at least 8 years old, and who required 24/7 supervision to maintain safety. The Commission stated that the term “profound autism” was critical to distinguish people who have high dependency needs from the more verbally and intellectually able population of people with autism. The Commission expressed “hope that [the introduction of “profound autism”] will spur both the clinical and research global communities to prioritize the needs of this vulnerable and underserved group.” Since that time, multiple research groups have conducted and published research on profound autism and others have expressed interest in doing so. Many of these groups have revised, added to, or removed elements of the Lancet definition. Because these research groups used different definitions of profound autism, it has been challenging to compare study results and share or link datasets, and has led to confusion as to the research definition of “profound autism.”

Objectives: A global “Delphi Consensus Process” was initiated to achieve consensus on a research definition of profound autism. The Delphi technique is a well-established approach to answering a research question through the identification of a consensus view across subject experts. This process was led by an independent consulting firm that has extensive experience conducting Delphi processes in the healthcare community.

Methods: A survey was developed covering 8 topics, consisting of 32 statements which would be tested for agreement/disagreement with a diverse group of autism researchers, clinicians, autistic persons and family members. 137 surveys were distributed via email and 76 responses were received across 5 geographic regions. The consensus threshold set by the independent consulting firm was 75% agreement.

Results: Of the 32 statements, consensus was achieved on 20. Areas of greatest consensus were around language, adaptive functioning, co-morbid diagnoses (including intense/dangerous behaviors) and the need for continuous support. For example, 92% of respondents agreed that people with profound autism exhibit periods of intense and dangerous behaviors; 95% of respondents agreed that a person with profound autism cannot consistently verbally communicate healthcare needs to caregivers or providers (e.g., express pain); 97% agreed that a person with profound autism requires adult support to meet their basic needs, e.g., food preparation, dressing, and bathing adequately; and 97% agreed that a person with profound autism requires an adult available to them 24/7 to maintain safety. There was less consensus about the IQ component of the profound autism definition. Requiring an IQ less than 50 achieved the highest consensus (68%). Inter-group differences were notable, particularly around IQ, with autistic persons and family members reaching consensus that IQ under 50 should be a part of the research definition, but clinicians and researchers disagreeing.

Conclusions: Based on these findings, a new working research definition of “profound autism” is proposed. Next steps include inviting the broad research community at INSAR to discuss and comment on the new definition.

203.002 Profound Autism: Parsing the Relative Contributions of IQ, Communication and Adaptive Behavior

M. Siegel¹ and **K. A. Pedersen**², (1)Boston Childrens Hospital, Boston, MA, (2)Center for Clinical and Translational Science, MaineHealth, Portland, ME

Background: Autism spectrum disorder (ASD) encompasses a wide range of symptoms. However, limited research focuses on those with profound autism (PA). The definition of PA, initially set by the Lancet Commission highlights the need for adult support but did not provide guidance on measurement of potentially defining domains like adaptive functioning, IQ, and verbal ability. Recent studies have focused on operationalizing PA through IQ and spoken language criteria, as when the CDC reported 26.7% of youth with ASD in a community sample met the PA criteria.

Objectives: This study aims to assess the relative contributions of adaptive functioning, IQ, and verbal ability in determining profound autism, using a sample from the Autism Inpatient Collection (AIC).

Methods: We analyzed data from the AIC, which includes 1,512 children and adolescents diagnosed with ASD using the Autism Diagnostic Observation Schedule-2 (ADOS-2) and DSM-5 criteria. The AIC is a multi-site study of youth with ASD hospitalized in psychiatric units due to significant emotional and behavioral challenges. Caregivers completed the Vineland Adaptive Behavior Scale-3 (VABS-3) upon admission, and participants were given the Leiter test of non-verbal intelligence. Verbal ability was identified per the appropriate ADOS-2 module. Profound autism was defined as having a Leiter non-verbal IQ score below 55, being minimally or non-verbal (ADOS module 1 or 2) or needing extensive support for daily adaptive functioning (VABS-3 $\leq$ 70). A logistic regression model was used to assess the contributions of Leiter IQ, VABS-3, and ADOS module as predictors of profound autism. The results are presented as odds ratios (OR) with 95% confidence intervals (CI).

Results: In the AIC sample, 72.2% of participants met the criteria for profound autism, significantly higher than the 26.7% reported by the CDC (Table 1). The logistic regression model explained a substantial portion of the variance in profound autism (Cox & Snell $R^2 = 0.497$; Nagelkerke $R^2 = 0.946$), indicating a good model fit. Leiter non-verbal IQ was a significant predictor of profound autism ($B = -0.089$, $SE = 0.041$, Wald $\chi^2 = 4.714$, $p = 0.030$). VABS-3 scores were a significant predictor ($B = -1.654$, $SE = 0.382$, Wald $\chi^2 = 18.744$, $p < 0.001$). For each unit increase in adaptive functioning, the odds of profound autism decreased by 81% ($OR = 0.191$, 95% CI: 0.091–0.405). In terms of IQ, the odds of profound autism decreased by 8.5% for each point increase in the Leiter ($OR = 0.915$, 95% CI: 0.844–0.991). ADOS module did not significantly predict profound autism status ($B = -57.876$, $SE = 1742.544$, Wald $\chi^2 = 0.001$, $p = 0.974$).

Conclusions: The findings underscore the critical role of adaptive functioning in predicting profound autism, followed by non-verbal IQ. Verbal ability contributed minimally to the prediction of profound autism. These results suggest that adaptive functioning and cognitive abilities are key factors in distinguishing profound from non-profound autism, which may guide more tailored interventions and precise measurement. A refined approach to defining PA could improve data comparability across studies and enhance interventions for this high-needs population.

203.003 Determinants of Participation/Attrition of People with Profound Autism in Research Studies

C. W. Nordahl, B. Heath, M. Solomon and D. G. Amaral, Department of Psychiatry and Behavioral Sciences, UC Davis MIND Institute, Sacramento, CA

Background:

Autistic individuals with co-occurring intellectual disability (ID), especially those with profound autism, are often under-represented in research studies. This is particularly problematic in neuroimaging studies of autism that often exclude individuals with lower intellectual abilities. In 2017, Jack and Pelphrey found that out of 47,400 autistic individuals in the National Database for Autism Research, only 11% had IQs < 85. Since 2006, we have conducted an inclusive longitudinal neuroimaging and behavioral study of autistic children enrolled at 2-3 years and followed for four time points through middle childhood (9-11 years). There are no restrictions based on intellectual ability, and the cohort represents the entire spectrum of abilities.

Objectives:

To assess behavioral and demographic variables associated with attrition/retention of families in the Autism Phenome Project. We also examine rates of scanning success in autistic children with ID (IQ < 70) and in children with profound autism (IQ < 50).

Methods:

We examined the rate of attrition in the autistic cohort from the time of enrollment (T1) at 2-4 years of age to the fourth longitudinal time point (T4) at 9-11 years (coinciding with when profound autism is identified; >8 years). To determine whether participant characteristics at baseline were associated with attrition, we compared scores from children who returned versus those who did not on T1 assessments of developmental ability (MSEL), autism symptom severity (ADOS CSS), adaptive functioning (VABS), externalizing behaviors (CBCL), and self-injurious behaviors (RBS). We also compared groups on several demographic factors at T1: maternal and paternal age, family income, and parental education. Additionally, we examined MRI scanning success rates in autistic children with intellectual disability, including those with profound autism.

Results:

At T1, 186 autistic children were enrolled and eligible to return for the T4 assessment ~7 years later. At T4, 118 (63%) returned and 68 (37%) did not. Comparison of scores of returners versus those lost to follow-up revealed no cognitive or behavioral differences at 3 years of age. Maternal age was the only demographic variable that distinguished autistic children who stayed in the study from those who did not. Mothers of children lost to follow-up were younger than returners (mean age 30.1 vs 32.2 years). Groups did not differ on paternal age, family income or educational level. Despite attrition, the cohort remained representative of the full spectrum of intellectual abilities at T4; 40% have IQs < 70 and 24% have IQs in the range of profound autism (<50). Regarding success of MRI scanning, of the scans attempted in children with IQs < 70 (n = 35), 77% were successful; this includes 15 children with profound autism.

Conclusions:

Our results suggest that there are no systematic differences in behavioral characteristics of autistic children at age 3 that predict retention or attrition in a longitudinal study. Moreover, representation of participants at the longitudinal visit includes a significant proportion with profound autism, suggesting that with adequate support there is no reason to exclude these children from research studies, even studies that involve neuroimaging as part of the protocol.

203.004 Patient-Centered Outcome Measures in Dup15q Syndrome and Profound Autism

S. Jeste and C. DiStefano, Children's Hospital Los Angeles, Los Angeles, CA

Background: Even as therapeutics for genetic forms of profound autism and intellectual disability show promise in preclinical studies, many phase 2 and 3 clinical trials have failed. One major obstacle to trial success is the identification of evidence-based, patient-centered clinical endpoints that are sensitive to meaningful change and reflect the needs of families. Our team has worked closely with industry and advocacy partners to bolster clinical trial readiness in Dup15q syndrome, a genetic condition associated with hypotonia, intellectual disability, and profound autism (Distefano et al, 2020; Saravanapandian et al, 2020). Here, we report the design of patient-centered outcome measures for future trials in this syndrome, first through the start of a Disease Concept Model (DCM) and then a syndrome specific Clinical Global Impression (CGI) severity scale. A disease concept model (DCM) is a framework that assesses the lived experience of individuals and their families. DCMs are based on qualitative interviews and capture the relationship between symptoms, concerns, and impact on daily life, and they can be used to generate trial endpoints. The CGI is a widely used clinician rating of severity of symptoms that is used as an outcome measure for trials in autism.

Objectives: (1) To develop a DCM of Dup15q syndrome to guide the choice of standardized outcome measures. (2) To develop a CGI that focused on specific clinical challenges in Dup15q syndrome.

Methods: For the DCM, in partnership with the Dup15q Alliance and an outside firm, we conducted caregiver interviews that were transcribed and coded using a HIPAA compliant qualitative data analysis computer software. Categories included symptoms and the impact of the symptoms on caregivers and individuals with dup15q syndrome. For the CGI, relevant domains were identified based on the DCM. For each domain, anchor descriptions were written to describe levels of symptomology (five ratings from “very mild” to “very severe”). A previously published CGI on Angelman syndrome was used as a template for the anchors, with modifications based on clinical expert opinion on the features of dup15q syndrome (Kolvezon et al, 2021). Vignettes were written by expert clinicians to train the providers on the use of the CGI for a trial.

Results: The initial DCM, based at this point on caregiver interviews, identified key developmental domains as therapeutic targets, including motor skills, cognition, language, and social skills. Other areas of importance included neurological, psychiatric, and medical. The CGI included ratings for the following areas, in descending order of concern: seizures, expressive communication, fine and gross motor skills, cognition, self-care, social interactions, maladaptive behaviors, sleep problems. A severity rating was based on a holistic evaluation of these items.

Conclusions: FDA and industry partners are deeply invested in developing more patient centered outcome measures for trials, especially in profound autism where standardized measures are limited in their ability to identify meaningful change. The DCM and CGI in dup15q syndrome will continue to be developed and will be used in ongoing and future clinical trials for this condition and can be modified for other genetic neurodevelopmental disorders.

Panel Session

204 - Integrating Research on Autism and Psychosis: Phenomenology, Social Cognition and Brain Measures across Both Spectra

May 1st, 2025, 10:30 AM - 12:30 PM - 611-614

Panel Chair: Tim Ziermans, *Department of Psychology, University of Amsterdam, Amsterdam, Noord-Holland, Netherlands*

Discussant: Noah Sasson, *University of Texas at Dallas, Richardson, TX*

Overlapping symptoms across the autism and schizophrenia spectra have long been recognized. However, limited research has examined the cognitive and neural underpinnings of this shared phenomenology, which could help inform targeted treatment innovations. In this symposium, we present findings from three types of study populations (general, high-risk, and clinical) using three different measurement approaches (phenomenology, cognitive performance, and neuroimaging). Specifically, the symposium will address: 1. The reliability of measuring autistic traits in general population samples characterized by low or high schizotypy; 2. The impact of autistic and psychotic features on anomalous self-experience in help-seeking individuals at risk for psychosis; 3. Comparison of neurocognitive and social cognitive performance in individuals diagnosed with autism or a schizophrenia spectrum disorder; 4. Different applications of resting-state fMRI to investigate links between brain activity, social cognition, and clinical symptoms and diagnoses. Taken together, these studies confirm the need to move beyond diagnosis-based analyses, highlighting that transdiagnostic research in clinical and non-clinical populations is essential for identifying subgroups within and across both spectra that may share more homogeneous underlying etiologies and show more targeted treatment responses.

Introduction

T. Ziermans, *Netherlands*

204.001 A Measurement Invariance Analysis of Autistic Traits in Individuals with Typical Range and High Schizotypal Traits
M. Pelton¹, **K. Chisholm**², **T. C. Ford**³ and **S. J. Wood**⁴, (1)University of Cambridge, Cambridge, Cambridgeshire, United Kingdom, (2)University of Sussex, Brighton, East Sussex, United Kingdom, (3)Cognitive Neuroscience Unit, Deakin University, Melbourne, VIC, Australia, (4)Orygen, Melbourne, VIC, Australia

Background: People with high autistic traits who develop psychosis experience worse outcomes than those with typical range autistic traits, including more severe psychotic symptoms, more frequent suicidality, lower quality of life, and reduced role functioning. The Autism Spectrum Quotient (Baron-Cohen et al., 2001) is widely used to assess autistic traits in psychosis services, however, it is yet to be validated in individuals with psychosis.

Objectives: We explored whether the measurement properties of the Autism Spectrum Quotient Short form (AQ-S; Hoeskstra et al., 2011) were equivalent in a general population sample of individuals with high and typical-range schizotypal traits. Schizotypal traits are sub-clinical personality traits reflecting psychotic experiences. Individuals with high schizotypal traits are more likely to experience schizotypal personality disorder and brief psychotic episodes.

Methods: 1713 participants aged 18 to 40 years (mean 26.4, 25% male) were recruited from the general population via social media and at an Australian University. Participants completed the AQ-S and the Schizotypal Personality Questionnaire (SPQ; Raine, 1991). High schizotypy was defined as the top 10% of SPQ scores (SPQ > 164/296, n=564). We undertook measurement invariance analysis, using multi-group structural equation modelling. Increasing parameters (thresholds, factor loadings and intercepts) were constrained equal across groups and models tested for significant degradation of fit.

Results: As shown in Table 1, the high schizotypy group were more likely than the typical range schizotypy group to be male (n=168, 29% vs n=263, 23%), have a history of psychiatric intervention (n=230, 41% vs n=358, 32%) and medication (n=156, 27% vs n=236, 21%), and reported higher scores on the SPQ (mean=187.31 (SD=19.36) vs 128.26 (SD=21.42)) and the AQ-S (mean=70.66(SD=7.92) vs 48.85 (SD=8.82)). Single group analysis confirmed that the model fit well in male and female gender groups and random samples. As shown in Table 2, the configural model showed reasonable fit to the data ($\chi^2=3428.625$ (df=688, CFI=.921, TLI=.914, RMSEA=.068). Constraining thresholds and factor loadings equally across groups resulted in no significant degradation of fit, meaning criteria for metric invariance was met. Constraining intercepts equal resulted in significant degradation of fit ($\Delta CFI=0.023$) meaning assumption of scalar invariance was not met. Constraining intercepts in 'imagination' ($\Delta CFI=0.01$) and 'switching' ($\Delta CFI=0.012$) subscales led to significant degradation of model fit.

Conclusions: The AQ-S demonstrated configural and metric invariance across groups meaning the same constructs can be measured in people with high and typical schizotypy. The AQ-S demonstrated scalar invariance in the social, routine and patterns and factors subscales suggesting these factors can be accurately measured and compared between groups. The imagination and switching factors were non-invariant suggesting bias in the measurement of these factors, which could indicate differences in baseline levels of imagination and switching difficulties in those with high compared to typical schizotypy. Overall, results suggest the AQ-S does not accurately measure autistic traits in those exhibiting a high degree of schizotypy. Future research should work in partnership with autistic people to develop accurate measures of schizotypal traits and should extend these findings in a sample of autistic people experiencing psychosis.



204.002 What Is the Impact of Autism Traits and Psychotic Symptoms on Anomalous Self-Experiences?
S. J. Wood, Orygen, Melbourne, VIC, Australia

Background: There are historical and theoretical indications of a difference in subjective experience between autism spectrum disorder (ASD) and the schizophrenia spectrum. While diagnostically independent, these conditions can co-occur in the same individual at both the trait and diagnostic levels, but the impact of such co-occurrence on subjective experience is unknown. The diametric model suggests that the two conditions represent the extremes of a unidimensional continuum of cognition and behaviour, which would imply that anomalous self-experiences would be attenuated in individuals with mixed symptom expressions.

Objectives: To test the combined effects of autism traits and psychotic-like experiences on anomalous self-experiences in a two groups of young people help-seeking for mental health problems, and a healthy comparison group.

Methods: A total of 150 participants were recruited, made up of people meeting clinical high-risk criteria for psychosis (CHR; n=84), people help-seeking for mental health problems without meeting high-risk criteria (Clinical Control; n=43), and those without mental health problems (Healthy; n=23). Clinical groups were recruited from several *headspace* clinics in Melbourne, Australia, which are clinical services designed for young people with mild to moderate mental health problems. Positive psychotic symptoms were assessed using the positive subscale of the Brief Psychiatric Rating Scale (BPRS), and autistic traits were assessed with the Autism Quotient (AQ). The presence or absence of self-disorders was assessed with the Examination of Anomalous Self-Experience (EASE) scale.

Results: Comparison of the groups for AQ, EASE, and BPRS positive scales revealed that the CHR group had the highest scores on all three measures, although they did not significantly differ from the Clinical Control group on AQ scores. Least-squares regression analyses were conducted in which EASE score was estimated with the Z standardized scores of the BPRS positive and AQ total scores, and their interaction. This produced a significant model ($F(3,148)=19.8$, $p<0.001$) where EASE scores were predicted by both BPRS positive ($\beta=0.42$, $t=5.84$, $p<0.001$) and AQ totals ($\beta=0.24$, $t=3.31$, $p<0.001$). The interaction term was negative, suggesting that when both BPRS positive and AQ scores were increased, EASE scores were smaller. However, this did not reach significance ($\beta=-0.13$, $t=-1.78$, $p=0.077$).

Conclusions: Anomalous self-experiences are positively associated with both positive psychotic symptoms and autistic traits. Although non-significant, there was tentative evidence that these self-experiences were attenuated in young people with equal expressions of positive psychotic and autistic features. This would be consistent with recent evidence for the diametric model of co-occurrence for schizophrenia and autism. Understanding why this occurs and its impact on clinical outcomes would assist in developing new intervention options for autistic people with psychotic disorders.

204.003 Comparative Analysis of Social and Neurocognitive Performance across Autism and Schizophrenia Spectrum Disorders and Related Neurobiology

A. Rashidi¹, S. Bagheri², L. Oliver², I. Moxon-Emre³, T. Tan², J. C. Yu², R. Pan², M. T. Secara², P. Desarkar⁴, M. C. Lai⁵, P. Szatmari⁶, E. W. Dickie⁷, A. Malhotra⁸, R. Buchanan⁹, A. Voineskos⁷, C. Hawco⁷ and **S. H. Ameis¹⁰**, (1)250 college st, Centre for Addiction of Mental Health, Toronto, ON, Canada, (2)Centre for Addiction of Mental Health, Toronto, ON, Canada, (3)The Centre for Addiction and mental health, Toronto, ON, Canada, (4)Department of Psychiatry, University of Toronto, Toronto, ON, Canada, (5)Campbell Family Mental Health Research Institute, Centre for Addiction and Mental Health, Toronto, ON, Canada, (6)Centre for Addiction and Mental Health, The Hospital for Sick Children, Toronto, ON, Canada, (7)The Centre for Addiction and Mental Health, Toronto, ON, Canada, (8)Northwell Health, New York, NY, (9)University of Maryland School of Medicine, Catonsville, MD, (10)Child and Youth Mental Health, The Centre for Addiction and Mental Health, Toronto, ON, Canada

Background:

Impacted social and neuro- cognitive performance has been reported across Autism and Schizophrenia Spectrum Disorders (SSDs).

Objectives: In the upcoming INSAR meeting, data will be presented comparing social and neuro-cognitive performance across a large sample, including autistic youth/young adults, individuals with SSDs, and typically developing controls (TDCs). Associations between social cognition, neurocognition and social functioning will be presented across groups. In addition, published data from our group examining neural correlates of social cognition across our transdiagnostic sample, using resting state brain activity, will be described.

Methods:

Participants were recruited from two National Institute of Mental Health funded studies (N=585; autism N=100, SSDs N=276, TDCs N=209; aged 16-55 years; 61% male assigned at birth). Participants completed social cognitive tasks, ranging from lower-level (e.g., emotion processing) to higher-level (e.g., theory of mind/mental state inference), the MATRICS Consensus Cognitive Battery, and a social functioning scale. Social and neurocognitive data across groups were compared using non-parametric methods, adjusting for age and sex, and relationships between social cognition with neurocognition and functioning were examined using within-group correlations. Permutation analysis of linear models was employed to investigate the relationship of fractional amplitude of low frequency fluctuation (fALFF) --a measure of resting-state spontaneous local brain activity-- with diagnostic group, higher and lower-level social cognition, in a subsample (autism N=68, SSDs N=242, TDC N=185) of the parent studies.

Results:

Autistic and SSDs groups performed worse than TDCs on lower- and higher-level social cognitive tasks, with few differences between clinical groups. Both autism and SSDs had lower neurocognitive scores than TDCs, where SSDs demonstrated more pronounced deficits in processing speed, working memory, verbal learning, and visual learning. Across groups, positive associations between social cognitive tasks and neurocognition were found across groups, but only self-reported measures of empathy showed consistent correlations with social functioning. Lower fALFF in the visual and higher fALFF in frontal regions were found in both autism and SSDs compared to TDCs. Positive associations between fALFF and higher level social cognition was found across the whole sample.

Conclusions:

This work compares both social cognition and neurocognition in a large autism/SSDs transdiagnostic sample. Findings confirmed that relative to controls, autistic participants and those with SSDs show similar performance on lower- and higher-level social cognitive tasks, while neurocognition was less impacted in autism versus SSDs. While both autistic and SSD groups featured significant differences in social cognition compared to TDCs, and overlap in differences in fALFF-measured resting-state brain activity, brain-behaviour findings suggested similar patterns of associations between regional resting-state brain activity and high-level social cognitive performance were present across autism, SSDs and TDCs. Our findings provide further support for transdiagnostic research into mechanisms underlying social cognition, and suggest some common neurobiological patterns associated with high-level social cognition across our heterogeneous transdiagnostic sample.

204.004 The Value of Excitation/Inhibition Ratio in Classifying Autism and Schizophrenia

M. Assaf¹, L. Uscatescu², C. Hyatt¹, J. Dunn³, M. Kronbichler⁴, V. Calhoun⁵, S. Corbera⁶, K. A. Pelphrey⁷, B. Pittman⁸ and G. Pearlson¹, (1)Olin Neuropsychiatry Research Center, Institute of Living, Hartford, CT, (2)Olin Neuropsychiatry Research Center, Hartford Hospital/Institute of Living/Olin Neuropsychiatry Research Center, Hartford, CT, (3)Interpretable AI, Cambridge, MA, (4)University of Salzburg, Salzburg, Austria, (5)Tri-institutional Center for Translational Research in Neuroimaging and Data Science (TReNDS) Georgia State University, Georgia Institute of Technology, Emory University, Atlanta, GA, (6)Department of Psychological Science, Central Connecticut State University, New Britain, CT, (7)Department of Neurology, University of Virginia School of Medicine, Charlottesville, VA, (8)Psychiatry, Yale School of Medicine, New Haven, CT

Background: Although autism spectrum disorder (ASD) and schizophrenia (SZ) have traditionally been considered as separate diagnoses, phenotypic overlap can hinder differential diagnosis. Overlap in underlying neural mechanisms have been suggested, including in excitation/inhibition (E/I) ratio imbalance. However, the extent of shared or differential E/I differences and their relationship to specific diagnosis is not well understood.

Objectives: We aimed to 1) directly compare in the E/I ratio between ASD, SZ and typically developed (TD) matched individuals and evaluate its viability to dissociate between ASD and SZ; 2) verify the results in an independent dataset; and 3) assess E/I ratio classification accuracy as a standalone measure and in combination with phenotypic measures.

Methods: We computed the Hurst exponent (H), an indicator of the E/I ratio, from the time courses of 53 predefined brain areas derived from resting state fMRI scans of two datasets: 1) An exploratory dataset that consisted of 519 TD, 200 ASD and 355 SZ available from publicly available imaging data repositories (e.g. ABIDE, BSIP), and 2) a replication dataset of 55 TD, 30 ASD and 39 SZ collected locally under unified protocol including symptomatic and social and non-social cognitive assessments. We first used a random forest classifier (RF) on the exploratory dataset to identify the ten H contributing the most to classify SZ and ASD. Next, we combined these H values with phenotypic information collected in the replication dataset and used RF to compare the classification performance using five models: (a) H only; (b) Positive and Negative Syndrome Scale (PANSS) and the Autism Diagnostic Observation Schedule (ADOS) only; (c) PANSS, ADOS, Bermond-Vorst Alexithymia Questionnaire (BVAQ), Empathy Quotient (EQ), and IQ; (d) H, PANSS and ADOS; (e) H, PANSS, ADOS, BVAQ, EQ and IQ.

Results: Classification parameters for the two datasets and all models are depicted in the attached figure. The classification performance using H only (model a) in the exploratory dataset was high (AUC = 84%). In the replication dataset this model yielded lower, yet acceptable performance (AUC = 72%). However, accuracy increased in this dataset in the models that include phenotypic data (models b to e), with the highest classification performance achieved when combining H with PANSS, ADOS, BVAQ, EQ and IQ (i.e., model e; AUC = 83%). For all models, sensitivity for classifying SZ correctly was higher than specificity, indicating a better classification of SZ compared to ASD.

Overall, the E/I ratio of the precentral gyrus, inferior occipital gyrus, lingual gyrus, and precuneus were the most important neural features contributing to the classification across the models. Phenotypically, the most important features were IQ, ADOS and PANSS positive and negative scores.

Conclusions: These results demonstrate that E/I ratio has a good discriminatory power between SZ and ASD as a standalone measure. Importantly, it augmented the discriminative effect of traditional phenotypic measures, illustrating the potential added value of E/I in differentiating ASD and SZ.



Panel Session

205 - Assessing Quality of Educational Settings for Autistic Students in Four Countries

May 1st, 2025, 10:30 AM - 12:30 PM - 608-609

Panel Chair: Samuel Odom, *Frank Porter Graham Child Development Institute, University of North Carolina at Chapel Hill, San Diego, CA*

To build the strengths of autistic children and youth, educators in many countries establish school-based programs to address the unique learning needs of their students. However, the power of such programs to effect positive outcomes for autistic students is a function of the quality of the educational environment and instructional/intervention features of such programs. In the past decade, there has been substantial progress in assessing the quality of educational programs for autistic students, with this work being conducted across countries and cultural contexts. The purpose of this panel presentation is to present research from four countries (Poland, Sweden, Spain, and the United States) addressing different dimensions of assessment of educational program quality for autistic students. Presenters will identify a variety of questions addressed about assessment of educational contexts and cultural adaptations they have made to common measures of quality.

Introduction

S. L. Odom, *Frank Porter Graham Child Development Institute, University of North Carolina at Chapel Hill, Chapel Hill, NC*

205.001 Improving Program Quality for Autistic Students in Swedish Primary School Classrooms: Outcomes from an Apers-Based Intervention

K. Wenneborg¹, **H. Bejn  ²**, **S. Bolte³** and **L. Roll-Pettersson⁴**, (1)*Stockholm University, Stockholm, Stockholm, Sweden*, (2)*Stockholm University, Stockholm, Sweden*, (3)*Center for Neurodevelopmental Disorders at Karolinska Institutet (KIND), Department of Women's and Children's Health, Karolinska Institutet, Stockholm, Sweden*, (4)*Department of Special Education, Stockholm University, Nyk  ping, Sweden*

Background: The increasing number of children diagnosed with autism in Sweden has highlighted the need for high-quality learning environments. However, research indicates that many educators lack sufficient knowledge of autism, evidence-based practices (EBPs), and inclusive learning environments. The Autism Program Environment Rating Scale (APERS), developed in the U.S., has been successfully used to improve program quality in educational settings in the U.S. and Swedish preschools. Yet, no comprehensive tool is currently available to evaluate autism program quality in Swedish primary schools. Collaborative research with schools using APERS could create sustainable change in the learning environment.

Objectives: This presentation aims to describe the process of translating, adapting, validating, and using the APERS to improve autism program quality in Swedish primary school classrooms. It also aims to share results from the research project, with a focus on the scale's cultural fit, social validity, and use in Swedish primary schools.

Methods: First, we culturally adapted and validated a Swedish primary school version of the APERS. Second, we piloted this version in 10 primary classrooms over one semester, assessing its feasibility and effects on autism program quality through an intervention that included APERS assessment, feedback, in-service training, action plan development, and coaching on implementing EBPs. Third, we conducted a quasi-experimental study with improved autism program quality as primary outcome. It involved four primary schools and 24 classrooms, divided into experimental and control groups, including 25 children (ages 6 to 9 years; 4 girls) with an autism diagnosis or related challenges across two cohorts and two school years. Additionally, coaches and teachers rated the intervention's social validity.

Results: The adapted scale demonstrated strong cross-cultural content validity for assessing autism program quality in Swedish primary schools, requiring substantial adaptations to fit the Swedish context. The pilot study showed significant improvements in the learning environment post-intervention (assessed by APERS). Insights from the pilot led to further modifications of the instrument and intervention and informed the design of the subsequent quasi-experimental study. In this study, autism program quality improved significantly in the experimental group compared to the control group ($F = 31.19$; $p = 0.001$; $\eta^2 = 0.59$). Significant within-group changes were observed in the domains of Learning Environment ($t [11] = -3.47$; $p = 0.005$), Assessment and Individual Education Plan ($t [11] = -4.48$; $p = 0.001$), Personal Independence ($t [11] = -4.17$; $p = 0.002$), and Teaming ($t [11] = -4.29$; $p = 0.001$) for the experimental group. Social validity assessment indicated moderate to high social validity, with coaches scoring higher than teachers.

Conclusions: The adaptation of the APERS to the Swedish primary school context demonstrated strong cross-cultural validity for assessing autism program quality. Findings from both the pilot and quasi-experimental studies suggest the APERS-based intervention is feasible and has the potential to significantly improve the learning environment's quality for autistic learners in Swedish primary schools. The intervention demonstrated high social validity and was well-received by both teachers and coaches.

205.002 Long-Term Evaluation of the National Professional Development Center on ASD (NPDC) Model in Therapeutic Preschools for Children with Autism in Poland

A. Waligórska¹, M. Waligórski², K. Kuncewicz-Sosnowska², M. Andrzejewska² and M. Rupińska², (1)The Maria Grzegorzewska University, Warsaw, (2)The SOTIS Autism Therapy Center, Warsaw, Poland

Background: The NPDC model of evidence-based (EB) educational practice for autism was developed in the US and has been implemented internationally. Poland, sharing similar educational regulations with the US but lacking a strong EBP tradition, presents an appropriate context for studying cross-cultural implementation. This study extends previous research by examining the long-term effects of NPDC model implementation in Polish therapeutic preschools. Formative assessment, as an element of EB models relates both to professional development of team members and to supporting fidelity of EBP implementation. However, especially in novel cultures, there is a tendency for overestimation of self- vs external evaluation of EBP implementation (Hu et al., 2014, McNeill, 2019). This study, conducted 3 years post implementation of the NPDC model in Polish therapeutic preschools aimed at: (a) a comparison of external and self-evaluation of quality of educational practice for students with autism, (b) an analysis of factors influencing the quality of services, related to model implementation.

Objectives: The APERS-PE (Autism Program Environment Rating Scale-Preschool/Elementary), a measure created by the NPDC, was used to compare the external and self-evaluation of quality of educational intervention for children with autism. The analysis involved potential factors influencing the evaluation.

Methods: Participants were 73 teachers and therapists working in 24 preschool groups 3 years after the conclusion of the NPDC model implementation (the model and its evaluation requirements were sustained post-implementation). The repeated measures analysis compared self- and external APERS evaluation of the team members, taking into account potential aspects of impact to the implementation fidelity (i.e. experience of working with EBPs, preschool status of implementation the NPDC model, attitude of preschool supervisor towards the measure, professional background of team members).

Results: Parallel to the previous, mid-implementation study, results indicated consistence of self- and external evaluation using APERS-PE. Both evaluation types indicated a high intervention quality (at the 80% of the maximum score). The analysis of variance demonstrated significance of duration of employment in the preschool using EB model ($F(1,72) = 7.43$, $p = 0.01$, $\eta^2 = 0.1$) and status of the implementation process (completed vs in progress; $F(1,72) = 7.85$, $p = 0.01$, $\eta^2 = 0.1$) for the overall intervention quality and for specific domains of the APERS-PE. Importantly, the observed interaction of these factors ($F(1,72) = 7.75$, $p = 0.01$, $\eta^2 = 0.1$), indicated that completion of the NPDC implementation in preschool related to high intervention quality in both experienced and new team members.

Conclusions: The results replicate previous findings of consistency between external and self-evaluation of intervention quality embedded in the NPDC model implementation. Similarly to the pilot study, the team members' experience of working in the establishment introducing EBP related to higher external and self-evaluation. Completion of the NPDC model implementation process by an establishment was also positively related to intervention quality in all team members, irrespective of their experience. The results support the notion that introducing the complex EB model in the novel cultural context such as Poland is feasible, and the effects are consistent several years after its sustained implementation.

205.003 Piloting of Apers Use to Measure Quality of Education Programs for Autistic Students in Spain

C. C. Gándara¹, **M. Martínez²**, **E. López³**, **O. Lizasoain⁴**, **L. Gámbrá⁴** and **A. Arellano⁴**, (1)Education, University of Navarra, Pamplona, Pamplona, Spain, (2)Psychology, University of Navarra, Pamplona, Spain, Spain, (3)Centro Huarte de San Juan, Pamplona, Spain, Spain, (4)Education, University of Navarra, Pamplona, Spain

Background: Measuring the quality of educational programs for students with autism is essential for enhancing educational strategies and ensuring accountability. In Spain, there are no validated, comprehensive tools to assess the quality of education for students with autism. The Autism Program Environment Rating Scale (APERS; Odom et al., 2023) is an instrument designed to evaluate critical areas for guaranteeing access to quality education for autistic students, whether in general education or self-contained settings.

Objectives: This study aims to evaluate the feasibility and application of both versions of the APERS (Pre-school/Elementary and Middle/High School; APERS-PE and APERS-MH) within the Spanish educational context.

Methods: Seventeen self-contained classrooms in Spain were assessed. The study was conducted at a special education center where the students (110 in total) are 6-22 years of age and have a diagnosis of developmental disability with high need for support; around 50% of the students are autistic. The participants of the sample (focus students) have a diagnosis of autism and intellectual (IDD). A bilingual research team member, certified in APERS-PE and APERS-MH, scored the instrument in four Preschool/Elementary (PE) and thirteen Middle/Highschool (MH) classrooms. Additionally, the Evidence-Based Classroom Observation Tool (EBP COT; Carnahan et al., 2018), a 27-item checklist overlapping in some domains with APERS, was completed for each classroom. Another researcher simultaneously conducted classroom observations, documentation reviews, and interviews with families and teachers, scoring 50% of classrooms to calculate intraclass correlation. Observations covered 24 hours over two months, spanning environments such as physical education, multisensory therapy (Snoezelen), physiotherapy, animal-assisted activities, speech therapy, social skills training, cooking, and laundry. Transitions between activities were also observed. Interviews were conducted on-site or via telephone with 17 main teachers, 14 family members, two speech-language pathologists (SLPs), one physiotherapist, and one administrator. The documentation reviewed included 34 individualized education plans (IEPs), 4 "My Plan" profiles, 4 "Get to Know Me" profiles, and 7 behavior records. Satisfaction surveys were completed by 34 school staff (teachers, SLPs, teacher aides, and specialists) and 56 family members through Google Forms.

Results: For APERS-PE, all domains scored above 3 (on a 1-5 Likert scale, where 3 indicates satisfactory implementation), with a mean of 3.7 (SD=1.04). APERS-MH scores averaged 3.65 (SD=1.19), though "Transition to Adulthood" scored low, likely due to infrastructure and cultural differences. APERS showed good internal consistency, with a Cronbach's alpha of 0.80. The consistency across domains was robust. APERS proved viable in Spain, and we discuss its comparison to EBP COT based on evaluation objectives, and also the utility of satisfaction scales in quality assessments.

Conclusions: APERS is a viable and valuable tool for assessing the quality of education for students with autism in Spain. Validation of this instrument would greatly benefit the Spanish educational system.

205.004 Measuring Program Quality By an External Assessor or Self-Evaluation

A. Sam¹, S. L. Odom² and B. Tomaszewski³, (1)Frank Porter Graham Child Development Institute, Carrboro, NC, (2)Frank Porter Graham Child Development Institute, University of North Carolina at Chapel Hill, San Diego, CA, (3)University of North Carolina at Chapel Hill, Chapel Hill, NC

Background: The Autism Program Environment Rating Scale Preschool Elementary Version (APERS-PE; Odom, Sam, Cox, 2024) was designed to measure the quality of preschool and elementary programs for autistic students. The full APERS assessment consists of 62 items that measure 10 domains (learning environments, positive learning climate, assessment and IEP development, curriculum and instruction, communication, social competence, personal independence and competence, interfering behavior, family involvement and teaming. A trained assessor gathers information through observations, record reviews and interview to score the measure. The APERS has a supplemental self-assessment which a teacher can use to reflect about their own practice. The APERS self-assessment consists of 32 items across the same 10 domains. The full APERS has been evaluated as a reliable and valid tool to measure program quality (Odom et al., 2018; Odom et al., 2022). However, limited research has explored the APERS self-assessment and its correlation to the full APERS.

Objectives: This study aims to explore the correlation between the full APERS-PE and the APERS self-assessment in elementary programs that serve students with autism.

Methods: Data are drawn from a larger randomized control trial. Seventeen teachers participated in this portion of the study. All teachers provided special education services for autistic elementary students in a separate, resource, or general education setting. For completing self-assessment, the teachers were provided a paper copy of the self-assessment. Teachers rated each of the 32 items as one of three responses: “This is a challenge in our program” (score of 1); “This element is consistently in place, but we still have some work to do.” (score of 3), or “This is a real strength of our program” (score of 5). A trained APERS assessor observed in the program for at least three hours, reviewed records (including IEPs and BIPs), and conducted interviews with team members and families. The assessor then scored each item of the full APERS on a scale from 1 (challenge) to 5 (strength). Descriptive statistics and correlations were used to examine the data.

Results: The full APERS total mean score was 2.90 (SD=0.66) with programs rating higher in domains of family involvement (M=3.56, SD=0.66), positive learning climate (M=3.37, SD=0.82), and teaming (M=3.25, SD=0.70). Programs were rated lower in the domains of social competence (M=2.32, SD=0.67), interfering behaviors (M=2.46, SD=0.90), and communication (M=2.62, SD=0.91). The self-assessment mean score was 3.67 (SD=0.27) with teachers rating higher domains of teaming (M = 4.63, SD = 0.62), positive learning climate (M=4.59, SD=0.42), and learning environments (M = 3.99, SD = 0.51). Teachers rated themselves lower in the domains of social competence (M=2.63, SD =1.03), interfering behavior (M=3.26, SD=1.01) and assessment and IEP development (M=3.37, SD=0.97). Based on pooled one-tail t test teaming $t(16)=0.461$, $p=0.032$; interfering behavior $t(16)=0.545$, $p=0.024$, and IEP and assessment $t(16)=-0.622$, $p=0.004$ were correlated.

Conclusions: While the APERS self-assessment was not correlated across all domains with the full APERS, the self-assessment did yield similar patterns based on descriptive statistics. The self-assessment could be used for formative information to facilitate development of plans for program improvement.

Panel Session

206 - Enhancing Equity and Access to Autism Services through Primary Care Integration

May 1st, 2025, 10:30 AM - 12:30 PM - 606-607

Panel Chair: Serene Habayeb, *Children's National Hospital, Washington, DC*

Discussant: Annie Inge, *Center for Autism (CASD), Center for Autism Spectrum Disorders, Children's National, Washington, DC*

Given the growing prevalence of Autism Spectrum Disorder (“autism”), and the continued shortage of autism specialists, recent guidelines from the American Academy of Pediatrics emphasize the need to build the capacity of pediatric primary care systems to support children with autism (Hyman et al., 2020; Jimenez et al., 2017). The focus of this panel will be to highlight innovative projects aimed at decentralizing autism services by embedding care within primary care settings, with a focus on improving equity and access. Studies will highlight the importance of embedding autism services in primary care settings by highlighting populations with high resource needs that have historically been underserved. Projects will also highlight innovative training and consultation models, including tele-consultation models for remote communities, to support providers in primary care to extend the reach of diagnostic services, and in turn, decrease reliance on overloaded specialty centers. Panelists will highlight innovative community engaged methodology used to ensure the scalability and sustainability of these integrated primary care models. Overall, this panel will highlight the value of place-based care to improve equitable access to autism care.

Introduction

S. Habayeb, *Center for Autism Spectrum Disorders, Children's National, Washington, DC*

206.001 Exploring the Childhood Opportunity Index in Autism Diagnostic Clinics in Primary and Specialty Care Settings

R. Iqbal¹, **A. B. Ratto**², **A. Inge**³, **L. Godoy**⁴, **E. Eisenman**⁴, **V. Fuentes**⁴, **S. Godovich**⁴, **M. Lauer**⁴, **T. Abu-Ramadan**⁵, **C. Lucke**⁴, **A. Taylor**⁴, **R. Williams**⁶, **X. Marshall**⁴ and **S. Habayeb**², (1)Georgetown University School of Medicine, Washington, DC, (2)Center for Autism Spectrum Disorders, Children's National, Washington, DC, (3)Center for Autism (CASD), Center for Autism Spectrum Disorders, Children's National, Washington, DC, (4)Children's National Hospital, Washington, DC, (5)University of Wyoming, Laramie, WY, (6)Child Health Advocacy Institute, Children's National Hospital, Washington, DC

Background: Although specialty autism centers typically serve a socioeconomically diverse population across a large catchment area, there continue to be significant racial and health inequities in access to autism diagnosis and care for children from very low-resourced neighborhoods, often due to geography and insurance barriers. One option to address these inequities is embedding evaluations in primary care settings which serve neighborhoods with low levels of resources, such as the Autism in Primary Care (APC) Program at Children's National Hospital in Washington, DC. APC is staffed by psychologists within community-based primary care clinics primarily serving patients with public insurance. No research to date has examined the sociodemographic characteristics of children diagnosed in specialty autism centers compared to primary care centers. Understanding differences in the families served in each clinic type can better elucidate social drivers of health (SDOH) that may impact access to autism care for low-resource populations and evaluate the benefit of services embedded in primary care.

Objectives: To evaluate differences in ethnoracial identity and socioeconomic status of children diagnosed with autism in urban primary care settings compared to specialty autism clinics, using the Childhood Opportunity Index (COI; a validated multidimensional index of neighborhood opportunities, ranging from 1-100, serving as an indicator SDOH).

Methods: The sample consisted of children under age six who received a primary diagnosis of autism between 2019-2023 at Children's National, either through primary care, APC ($N = 310$; $M_{\text{age\_months}} = 38.43 \pm 13.31$) or a specialty autism center, Center for Autism Spectrum Disorders (CASD; $N = 212$; $M_{\text{age\_months}} = 50.37 \pm 13.62$). Chi-squared analyses examined ethnoracial differences between the groups. The metropolitan area-normed COI was used to characterize SDOH. Linear regression analyses were conducted to determine whether clinic setting (APC versus CASD) predicted COI scores while controlling for race and age.

Results: There were significant differences in the ethnoracial breakdown of the groups, $X^2(6, N = 522) = 178.52, p < .001$. Children served through APC were predominantly Black (88.7%) and children diagnosed through CASD were more racially diverse (Black 35.9%; Latine 24.1%; and White 19.8%). 79.8% ($n = 170$) of the APC sample and 20.3% ($n = 43$) of the CASD sample resided in "Very Low" opportunity neighborhoods ($< 20^{\text{th}}$ COI percentile). Regression analyses revealed that, controlling for age and race, compared to children receiving autism diagnostic services in APC, those receiving services at CASD had an estimated 21-point higher COI ($\beta = 21.43$; $p < 0.001$).

Conclusions: The results of this study suggest that traditional autism clinics, although serving an ethnoracially diverse population from a wide geographical area including rural and exurban areas, may still be missing children from very-low resourced neighborhoods. Findings speak to the importance of place-based care and embedding services in primary care clinics to ensure equity in access to diagnostic services. Doing so can address significant health disparities in access to autism care and inform critical policy work to reduce health inequities. Future planned analyses will examine whether COI score predicts autism symptom severity and behavioral characteristics in children seen at both clinics.

206.002 Using Synchronous and Asynchronous Teleconsultation to Increase Access to Autism Evaluations in Primary Care Settings
J. Hine¹, T. E. Foster¹, K. Carlson², C. Stone³, A. K. Spitler², R. Coleman⁴, Z. Warren³, L. Bahrami⁵ and H. Miller⁶, (1)Division of Developmental Medicine, Vanderbilt University Medical Center / VKC TRIAD, Nashville, TN, (2)Vanderbilt University Medical Center, Nashville, TN, (3)Vanderbilt University Medical Center - Treatment and Research Institute for Autism Spectrum Disorder, Nashville, TN, (4)Department of Pediatrics, Vanderbilt University of Medical Center, Nashville, TN, (5)Division of Pediatrics, Vanderbilt University Medical Center, Nashville, TN, (6)Division of General Pediatrics, Vanderbilt UMC, Nashville, TN

Background: Factors such as limited availability of autism specialists and long wait times for diagnostic confirmation support the need for increased timeliness of action-steps within primary care settings. Using embedded specialists and teleconsultation procedures to support diagnoses in primary care settings significantly decreases service delays, reflects high levels of parent/provider satisfaction, and fosters additional opportunities for primary care provider (PCP) training and family support.

Objectives: We examined the use of synchronous and asynchronous specialist teleconsultation to improve access to diagnostic assessment within a network of primary care clinics. The objective was to sustain low wait times, an early age of diagnosis, and provider/family satisfaction across clinics that varied in geography, patient volume/demographics, and autism-specific PCP training experience.

Methods: We extended our streamlined diagnostic model across a network of primary care clinics using synchronous and asynchronous teleconsultation procedures. Children under 48 months were referred from six primary care clinics affiliated with our medical center. Families either received a) a clinic-to-clinic (C2C) or direct-to-home (D2H) tele-diagnostic assessment lead by a psychologist or b) an e-consultation procedure through which a psychologist confirmed a diagnosis via a recorded evaluation submitted by a trained PCP. All families that were seen through teleconsultation procedures were eligible for expedited in-person assessment as necessary. Using data from our in-person hub clinic as a comparator, we compared 1) patient demographics, 2) age at diagnosis, 3) evaluation type, 4) wait times, 5) need for in-person follow up, and 6) provider/family satisfaction with the assessment across types/settings. Data were extracted from our electronic health record (EHR) as well as via REDCap surveys.

Results: Data were extracted for the last 12 months of service during which 80 synchronous teleconsultations and 49 e-consultations were completed across satellite clinics. These data were compared to the same 12 months of our in-person clinic in which we have embedded diagnosticians providing streamlined evaluations (113 in-person visits). Data suggests that the teleconsultation model was successful, as shown by sustained low wait times (median days to evaluation C2C/D2H = 90, e-consult = 35, vs. in-person = 103) and sustained early age of diagnosis (median years for teleconsultation clinics = 2.6). The number of teleconsultation visits that necessitated in-person follow up was low overall (24%), but reasons for follow-up varied (i.e., family/provider preference as opposed to lack of diagnostic certainty). Teleconsultation clinics served a diverse patient population (65% racially/ethnically/linguistically diverse, 70% public insurance). Family/provider feedback showed high rates of satisfaction with teleconsultation model overall, with specific areas for improvement identified.

Conclusions: Extending our diagnostic program via two types of teleconsultation resulted in sustained improvements in accessibility, provider certainty, wait times, age of diagnosis, and provider/family satisfaction. Further, extension clinics served a racially/ethnically/linguistically diverse population and helped minimize common barriers to care (e.g., access to tertiary care, rural locations, lack of autism-specific training for PCPs). Discussion will include specific comparisons across visit types, review of feedback from providers and families, and plans to further address disparities via more longitudinal primary care support.

206.003 Bridging the Gap: Expanding Autism Evaluations in Primary Care

T. Snider¹, R. Lyren¹, A. Moore¹, K. G. Stephenson¹ and B. Mackinaw-Koons², (1)Nationwide Children's Hospital, Columbus, OH, (2)The Ohio State University, Columbus, OH

Background: The prevalence of autism spectrum disorders has increased over the past decade with a current reported prevalence of 1 in 36 children identified with ASD (CDC ADDM, 2023). Long wait lists for autism evaluations nationally have resulted in delays to diagnosis, which subsequently results in delays to accessing early intervention and treatment services (Hightshow et al., 2023). The frequency of recommended well-child checks and developmental surveillance recommended by the American Academy of Pediatrics makes the pediatric primary care center (PCC) a critical and valuable setting to aid in early identification of children with suspected autism. The evidence supporting integration of behavioral health providers in primary care further creates an opportunity to promote early identification of developmental delays including access to targeted autism evaluations resulting in shorter wait times and earlier age of diagnosis.

Objectives: The Integrated Primary Care Autism Spectrum Disorder (IPC ASD) evaluation pathway was developed in collaboration with our academic medical center's (AMC) primary care network, developmental and behavior pediatrics, and our AMC's affiliated autism center. The Autism Learning Health Network's diagnostic algorithm was utilized as a framework with the goals of decreasing the time families wait from first concern to diagnosis and improving timely access to evidence-based care and critical early intervention services. The work focused particularly on families who identify as racial or ethnic minorities.

Methods: Baseline data on autism evaluation completion rates and wait times from referral to diagnosis in the AMC's autism center was gathered. After determining root causes as barriers for completing evaluations, the primary intervention was development of the IPC ASD evaluation pathway. The IPC ASD pathway was developed in 2020 with the goals of decreasing the time families wait from first concern to diagnosis and improving completion rates of evaluation, particularly for underserved populations. Key drivers adopted include clinic staff education, collaboration with providers in the AMC's autism center, creation of EMR strategies to support implementation, and strategies to support patient and family experiences.

Results: From November 2020 through October 2023, the IPC ASD evaluation pathway received 671 appropriate referrals. The IPC ASD pathway completion rate was 81.5%. In comparison, the completion rate for the evaluation pathway in our AMC's affiliated autism center (traditional pathway) from 2019-2022 was 63.5%. The median days from referral for IPC ASD evaluation to feedback was 38 days (SD 62.4) compared to 138 days in the traditional pathway. The average age of diagnosis for patients evaluated through the IPC ASD pathway was 35.3 months. Review of patient demographics reveal that patients who identify as racially and ethnically diverse are more likely to complete the IPC ASD pathway compared to the traditional pathway.

Conclusions: By creating a new level of service for targeted autism evaluations in the pediatric primary centers, our PCN and Behavioral Health system was able to improve access to care for patients and families in need of an autism evaluation resulting in decreased wait time and earlier age of diagnosis, particularly for families who encounter barriers navigating complex health systems.

206.004 Primary Care Autism Diagnosis: Enhancing Quality and Scalability of Training through Human-Centered Design

R. McNally Keehn¹, B. Cockrum², A. Kiser², A. Harishchandrar², A. Paxton¹, T. Ryan-Lengacher³ and S. Wiehe³, (1)Pediatrics, Indiana University School of Medicine, Indianapolis, IN, (2)Indiana Clinical and Translational Sciences Institute Patient Engagement Core, Indiana University School of Medicine, Indianapolis, IN, (3)Indiana University School of Medicine, Indianapolis, IN

Background: Autism prevalence has increased by nearly 400% in the past 20 years, but the systems in place to support diagnosis have not kept pace. Primary care autism diagnosis is one solution to address this public health crisis. There is mounting evidence that primary care autism diagnosis is feasible, accurate, reduces evaluation wait time, and allows for streamlined access to community interventions. Despite this potential, widespread uptake of autism diagnosis within primary care has been limited by implementation challenges, including the time and resource intensive nature of training primary care physicians and clinicians (PCP).

Objectives: To revise an evidence-based training program for community PCPs to reach independent competency in the diagnostic evaluation of young children at increased likelihood for autism using a human-centered design approach. Specifically, our goal was 1) to identify strengths and challenges with the training program to drive refinements, and 2) to explore strategies to enhance training quality and scalability.

Methods: *Accelerating the Diagnosis of Autism with Primary care Training (ADAPT)* is a training program to prepare PCPs to develop independent competency in evaluating young children ages 14-48 months for autism. ADAPT includes didactic education, case-based observation, and case-based practicum with practice-based coaching delivered by an expert diagnostic specialist. An interdisciplinary team of human-centered design research experts led two virtual 2-hour sessions, applying participatory design techniques to co-create solutions with PCPs (session 1: N=9; session 2: N=6) who previously participated in the ADAPT training program. A variety of evidence-based co-design methods, including experience mapping, generative activities, and prototype development, were utilized. Qualitative analysis methods (i.e., affinity grouping and data visualization) were used to identify themes and subthemes across the data from each session. Themes from session 1 guided changes to a revised ADAPT prototype that was presented to PCPs in session 2.

Results: In the first co-design session, primary themes regarding ADAPT strengths emerged across the domains of training format (e.g., flexible synchronous or asynchronous options; expert trainer support), content (e.g., practical and comprehensive), and technology (use of learning management platform). Key weaknesses or threats to sustainability included need for greater transparency regarding training processes, non-reimbursable time spent on training, specific gaps in content areas, and need for greater usability of the training platform. In the follow-up session, PCPs reported that ADAPT prototype enhancements including development of a pre-training orientation video, added content on differential diagnosis of autism, and guidance on practical logistics of evaluation (i.e., billing and coding guidelines) improved the training experience. Additional areas for training enhancements, including the need for individualized training based upon PCP experience, were identified.

Conclusions: Human-centered design is an efficient and impactful method for co-creating solutions with end-users to solve critical healthcare challenges. PCP end-users provided key insights to enhance quality and scalability of an evidence-based primary care autism diagnosis training program. Preparing PCPs to deliver autism diagnostic evaluations within community settings has the high potential to ameliorate autism diagnostic delays and disparities.

Oral Session -

301 - New Findings from Early Intervention Randomized Controlled Trials

May 1st, 2025, 2:00 PM - 3:00 PM - 6B

Moderator: Tony Charman, *Institute of Psychiatry, Psychology and Neuroscience, King's College London, London, UNITED KINGDOM*

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301.001 Supporting Social Learning in Toddlers with Autism: The Role of Parental Responsiveness and Mediated Learning
X. Liu¹, H. Schertz² and J. Li³, (1)Utica University, Utica, NY, (2)Indiana University, Bloomington, IN, (3)Indiana University, Indianapolis, IN

Background:

Studies regarding parent-implemented interventions for children with autism have focused mainly on increasing parental responsiveness (Jones et al., 2017; Watson et al., 2017), modeling and shaping toddlers' behaviors (Wong & Kwan, 2010) and incorporating naturalistic behavioral strategies into daily activities (Baranek et al., 2015; Kasari et al., 2015). However, the results indicated mixed outcomes regarding improvements in children's social communication (Sandbank et al., 2020). Few studies have investigated parents' influence on children's social communication outcomes. To address this need, this study explored factors that support parents in creating social learning opportunities for their children with autism.

Objectives:

1. To explore pairwise associations between social communication outcomes for toddlers with autism (i.e., initiation of and response to joint attention and social demeanor) and parents' outcomes (i.e., application of mediated learning practices and parental responsiveness).
2. To examine potential differences in the associations between control and intervention groups.

Methods:

This study used secondary data from a randomized control trial, the Joint Attention Mediated Learning (JAML) intervention study (Schertz et al., 2018). It included 119 toddlers aged 30 months or younger who met the criteria for an autism diagnosis and were randomly assigned to experimental or control groups. Intervention Coordinators (ICs) conducted weekly 1-hour home-based sessions with parents for 32 weeks. During these sessions, ICs facilitated parents' learning and reflection on applying mediated learning practices in daily interactions with their children.

The Mediation of Social and Transactional Engagement Measures (MOSTE; Schertz, Horn, et al., 2018) was used to assess parents' application of mediated learning practices. Assessors, trained for reliability, analyzed 10-minute parent-child interaction videos to evaluate parents' application of mediated learning practices. The Maternal Behavior Rating Scale (MBRS, Mahoney, 1998) assessed parental responsiveness. The Preverbal Joint Attention Measures (PJAM; Schertz, 2013) assessed children's social communication outcomes, where their social outcomes were observed from the 10-minute parent-child interaction videos.

Using structural equation modeling, we analyzed pairwise associations between parent practices (mediated learning and responsiveness) and children's social communication outcomes.

Results:

Significant findings included the following:

1. Initiation of joint attention was associated with mediated learning practices but not parental responsiveness.
2. Response to joint attention was associated with parental responsiveness but not mediated learning practices.
3. Positive social demeanor was associated with both mediated learning practices and parental responsiveness, with a high magnitude of association for mediated learning practices and a lower magnitude for parental responsiveness.
4. A positive association between mediated learning practices and toddlers' social communication outcomes was found for the intervention group but not the control group.

Conclusions:

Mediated learning practices were found to be particularly effective in promoting the initiation of joint attention in toddlers with autism. The findings suggest that children with autism are more likely to develop initiation of joint attention when they are actively engaged in social interactions. The presentation will address the implications of enhancing parents' competency in promoting children's social communication outcomes.



301.002 Does Brief Computer-Based Attention Training Prime Responding to a Caregiver-Mediated Intervention for Toddlers with Emerging Autism? Insights from a Randomized Control Trial of the Social ABCs

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Background: Caregiver-mediated, naturalistic developmental behavioral interventions (NDBIs) for toddlers with emerging autism/ASD show evidence of benefits. Participation in one such NDBI, the Social ABCs, yields gains in toddler social communication and a trend toward increased social orienting, as well as caregiver fidelity and self-efficacy.

Objectives: (1) Examine the impact of a computer-based attention training module prior to the Social ABCs (condition). (2) Replicate findings for caregiver fidelity and toddler outcomes immediately following the Social ABCs and at 3-month follow-up (time).

Methods: 67 toddler-caregiver dyads (62 mothers; 30 White, 28 BIPOC) were randomized to receive 6-8 sessions of a computer-based attention training (AT) protocol vs. a sham control condition. All participants then engaged in a 12-week, in-person Social ABCs in their homes. Toddlers (52 boys, 15 girls; 18-32 months old, mean 25.95m, $SD = 3.65$) had confirmed ASD ($n = 32$) or early signs ($n = 29$). Two 10-min videos were collected four times: (T1) Baseline, (T2) Post-Attention Training / Pre-Social ABCs, (T3) Post-Social ABCs, and (T4) Follow-up 3 months after T3. Videos were coded for toddler and caregiver variables, naïve to timepoint and condition, with moderate-to-good inter-rater agreement (mean Kappa across variables: .50 - .66). We analyzed average scores per timepoint using Linear Mixed Modelling to examine change over time across AT conditions.

Results: **Condition effects.** After controlling for significant covariates, two toddler-level variables yielded informative condition effects: Initiations and social orienting. Toddler initiations (rate/min) were significantly higher for toddlers in the attention training condition ($M = .57$ vs. $= .32$), $F(1,208) = 14.86$, $p < .001$. Parent smiling also showed an effect, $F(1,249) = 4.76$, $p = .03$, with families in the sham condition smiling more overall. The condition effect for child social orienting showed a nonsignificant trend, $F(1,245) = 2.86$, $p = .09$. **Time effects** emerged for toddler responsivity ($F(3,235) = 83.14$), social orienting ($F(3,245) = 17.02$), toddler smiling at parent ($F(3,249) = 5.81$), parent implementation fidelity ($F(3,248) = 204.61$, p 's $< .001$) and parent smiling ($F(3,249) = 2.74$, $p = .044$). Post hoc pairwise comparisons showed that T1 and T2 (pre-Social ABCs) differed significantly from T3 (post-ABCs) and T4 (follow-up) for responsivity, social orienting, and parent fidelity; T1 and T2 differed from T4 for child and parent smiling.

Conclusions: (1) Attention-training prior to the Social ABCs appeared to boost toddlers' rate of initiations to their caregiver, with a trend toward fostering increased social orienting. Parent smiling was higher overall for the sham condition, warranting further investigation. The absence of significant condition by time interactions suggests that any effects of such pre-treatment may be subtle. Further refinements may be warranted.

(2) Results replicate previous work wherein participation in the Social ABCs yields significant gains in toddlers' responsivity and increased implementation fidelity and smiling in caregivers. We extend previous findings to include significant increases in toddlers' social orienting and smiling toward their caregivers, which may be explained by an increased emphasis on activities that elicit positive emotion-sharing in this version of the Social ABCs.

301.003 Complex, Low Intensity, Individualised Naturalistic Developmental Behavioural Intervention in Toddlers and Preschoolers with Autism Spectrum Disorder: The Multicentre, Observer-Blind, Parallel-Group Randomised-Controlled a-Ffip Trial
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Background:

Naturalistic developmental behavioural interventions (NDBI) may improve social communication in toddlers/preschool aged children with Autism Spectrum Disorder (ASD).

Objectives:

Here, we study efficacy of the low-intensity, complex NDBI “Frankfurt Early Intervention Program for ASD” (A-FFIP) over one year by a confirmatory phase-III, prospective, randomized, controlled, parallel-group study with two treatment arms over four centres at Frankfurt, Augsburg, Dresden and Wuerzburg.

Methods:

Main inclusion criteria: ASD (DSM-5), age 24 to 66 months, developmental quotient > 30. *Intervention:* Manualised A-FFIP intervention. *Control intervention:* Early intervention as usual (EIAU). *Primary outcome:* Change in core ASD symptoms between 12 months of intervention (T6) and baseline (T2) based on the blindly rated Brief Observation for Communication Change (BOSCC) total score. *Statistical analysis:* Mixed model for repeated measures with covariates baseline BOSCC-total, chronological age and centre.

Results:

Between July 2018 and October 2021, N=134 children with ASD were randomly allocated to intervention (A-FFIP: n=68, EIAU: n=66). Groups did not differ at baseline with a mean age of 49 (SD 10) months, mean developmental age of 23.3 (SD 13.6) months, and 26 (19.4%) females. The SARS-CoV2 pandemic interfered severely with trial procedures. Intention to treat-analysis in the primary analysis set with at least one post-baseline BOSCC measure (A-FFIP n=64, EIAU n=60) did not find differences in the primary outcome by group. Treatment interruption due to the SARS-CoV2 related lockdown was associated with less improvement across groups. Secondary outcomes showed stronger improvements in parent-rated repetitive behaviour as well as parent- and teacher-rated executive functions for A-FFIP versus EIAU. Adverse events were comparable between groups.

Conclusions:

A-FFIP, which allows individually targeting six core basic abilities and five developmental domains related to longitudinal development in ASD, is a promising, manualised NDBI, which needs to be further studied for long-term effects on social communication and other outcomes in ASD.

Reference to published trial protocol

Kitzerow, J., Hackbusch, M., Jensen, K., Kieser, M., Noterdaeme, M., Frohlich, U., et al. (2020a). Study protocol of the multi-centre, randomised controlled trial of the Frankfurt Early Intervention Programme A-FFIP versus early intervention as usual for toddlers and preschool children with Autism Spectrum Disorder (A-FFIP study). *Trials*, 21(1), 217.

Keywords: naturalistic, developmental, behavioural, autism, social communication, repetitive behaviour, randomised-controlled

301.004 Online Parent Coaching to Target Social and Language Outcomes for Chinese-Learning Autistic Preschoolers: One-on-One and Group Formats Are Comparable

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Background: Parent-implemented communication programs effectively support the social and communication development of autistic children in daily interactions. However, these programs are typically offered in a One-on-one-format, which can place a financial burden on the healthcare system and be cost-prohibitive for many families.

Objectives: To compare the effectiveness of a One-on-one-format versus a cost-effective Group-format of a completely online, parent-implemented support program to enhance social and language outcomes for Chinese-learning autistic preschoolers.

Methods: This ongoing randomized controlled trial recruited 144 Cantonese-learning preschoolers, who will be followed for two years. All children were diagnosed with or evaluated to be at elevated likelihood of autism by a qualified clinician, and were assessed and classified as “autism” or “autism spectrum” using the Autism Diagnostic Observation Schedule, Second Edition (ADOS-2). Children with insufficient verbal language, determined by a score greater than zero on ADOS-2 Item A1, were included. Families were randomly assigned to either One-on-one-format (n=72) or Group-format (n=72, with up to eight families per group). One parent per child participated in a six-month, 20-session online social communication program taught by a speech therapist. Parents learned seven communication strategies to implement with their child at home, with extensive coaching and video feedback provided throughout the program. A total of 93 children, aged 24-57 months (mean 37.18±8.23), who reached the one-year follow-up with data from the 6-month and/or 12-month assessments, were included in the analysis.

Demographic data were collected at baseline. To measure changes in socialization and language abilities, ADOS-2 and Mullen Scales of Early Learning (MSEL) assessments were performed at baseline and 12-month. Parent-reported Vineland Adaptive Behavior Scales – Third Edition (Vineland-3) were collected at baseline, 6-month (upon program completion) and 12-month as secondary outcomes. Paired t-tests were used to compare baseline and 12-month outcome measures, including: (1) age-adjusted ADOS-2 Comparison Scores, (2) ADOS-2 Social Affect raw score, (3) ADOS-2 Repetitive and Restricted Behavior raw score, (4) age-adjusted MSEL Receptive Language and (5) age-adjusted MSEL Expressive Language. ANCOVA models were applied to assess the influence of the *Intervention format* (One-on-one vs Group). For age-adjusted Vineland-3 Socialization and Communication scores, repeated measure ANCOVAs were applied to evaluate the effect of *Time* (Baseline, 6-month and 12-month) and *Time*Intervention format* interaction.

Results: At the one-year follow-up, children's ADOS-2 Social Affect raw score showed significant improvement in both formats (One-on-one: $p=0.034$, $d=0.32$; Group: $p=0.025$, $d=0.34$), suggesting that both intervention formats were effective in enhancing children's socialization. For age-adjusted MSEL Receptive Language, children in the One-on-one format demonstrated significant improvement ($p=0.003$, $d=-0.45$), while those in the Group-format did not ($p=0.120$, $d=-0.24$); however, the ANCOVA model revealed no significant differences between the intervention formats. For age-adjusted MSEL Expressive Language, improvements were found in both formats (One-on-one: $p<0.001$, $d=-0.87$; Group: $p=0.034$, $d=-0.33$) children. Furthermore, the ANCOVA model indicated that children in the One-on-one-format had greater improvement compared to those in the Group-format ($F=7.714$, $p=0.017$, $\eta^2p=0.391$) (Table 1 and Figure 1).

Conclusions: Online parent coaching with the option of a Group-format is effective in enhancing social and language outcomes for Chinese-learning autistic children.



Oral Session -

302 - Social Interaction and Communication between Autistic and Non-Autistic People

May 1st, 2025, 2:00 PM - 3:00 PM - 6C

302.001 Verbal Collaboration in Same and Mixed Neurotype Groups of Autistic and Non-Autistic Adults

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Background: Autistic adults often communicate more effectively and establish better rapport with other autistic people than with non-autistic people, both in one-on-one and group settings (Crompton et al., 2020; Morrison et al., 2020; Foster et al., 2024). Thus, differences in social and communicative styles between autistic and non-autistic people (Crompton et al., 2020; Milton, 2012) may affect collaborative success and interpersonal outcomes. However, it is unclear how communication differs between autistic and non-autistic people in group settings, and whether potential differences are affected by the diagnostic composition of the group. One approach to explore this is by examining verbal collaboration (Avry et al., 2020), a term that refers to a sub-category of speech involving collaborative intentions through socio-cognitive and socio-relational processes (Austin, 1975; Dillenbourg et al., 2016).

Objectives: To investigate differences in verbal collaboration among autistic and non-autistic adults in same- and mixed-neurotype groups.

Methods: Seventy-three autistic and sixty-three non-autistic adults participated (table 1). Participants were allocated to one of four conditions with three other participants: all autistic, all non-autistic, autistic neurominority (1 autistic and 3 non-autistic), and non-autistic neurominority (1 non-autistic and 3 autistic), totaling 34 groups. Each group was aware of its diagnostic composition but not participants' specific diagnoses. Groups engaged in a five-minute task to build a tall tower with large Jenga blocks using vague instructions that could be interpreted as collaborative or competitive. Interactions were recorded and transcribed. Two researchers coded instances of collaborative speech, including: propositions (given and elicited), elicited opinions, positive and negative self-directed and other-directed opinions, agreements, and incorporations from an established scheme (Avry et al., 2020). The researchers achieved substantial inter-rater reliability ($k=0.81$).

Results: Autistic participants expressed more positive opinions about the task/group $t(134) = .894, p=.039$ and their contributions $t(134)= 1.53, p=.002$ than non-autistic participants, whereas non-autistic participants prompted more building ideas $t(134)= 2.29, p<.001$ and expressed more negative opinions about the task/group $t(134)= 1.02, p=.003$. Multilevel models indicated that the effect of participants' diagnosis on "negative opinions directed at others" was dependent on the diagnostic composition of the group ($p=.007$). Simple slopes demonstrated that expressions of negativity about the group and task were lowest for autistic participants in the all autistic groups and increased as more non-autistic members were included (no non-autistic: $M=1.04$; one non-autistic: $M=1.62$; all non-autistic: $M=2.78$) (figure 1). No effect of group composition type was found for non-autistic participants ($p=.20$).

Conclusions: Distinct patterns emerged in collaborative speech between autistic and non-autistic participants. Overall, autistic adults verbalized more positivity and less negativity than non-autistic adults. However, they increased negative expressions when in groups of non-autistic adults. These results mirror previous findings indicating that rapport for autistic adults is highest in all autistic groups and diminishes with the presence of non-autistic members (Foster et al., 2024). In contrast, markers of verbal collaboration by non-autistic participants remained stable across group types. Taken together, these findings suggest that autistic adults often benefit socially when interacting with each other and may be more sensitive to group composition than non-autistic participants.



302.002 Can the Double Empathy Problem be Mitigated By Interacting Online? - a Direct Comparison of Online and in-Person Interactions.

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Background:

The Double Empathy Problem (DEP) suggests a bi-directional disconnect between autistic and non-autistic individuals (Milton et al., 2018). Following short in-person interactions, less rapport and reduced information transfer was achieved when autistic and non-autistic people interacted, compared to when individuals of the same neurotype interacted (Crompton et al., 2020). So far, research into the DEP has focused on in-person interactions although online interactions may provide autistic people with visual anonymity, greater flexibility (Benford et al., 2009) and an opportunity to express their true selves (Gillespie-Lynch et al., 2015). Preliminary evidence indicates that the DEP may be mitigated during online interactions (Marsh et al., in prep) although a direct comparison between online and in-person modalities has not been tested.

Objectives:

Here we evaluate whether the DEP is mitigated online by testing whether mixed and matched neurotype dyads achieve equivalent rapport in online compared to in-person interactions.

Methods:

In this pre-registered study, 39 non-autistic and 32 autistic participants completed online and in-person dyadic interactions using a 'speed dating' paradigm. Interactions with mixed and matched neurotype partners were completed for each modality in a within-subject design. Rapport was measured after each interaction. After exclusions, $n=427$ interactions and $n=854$ interaction ratings were analysed.

Results:

Rapport data were analysed using linear multilevel models (LMMs) in R. Models included fixed effects of Dyad Type (Mixed, Matched neurotype), Modality (Online, In-Person), Participant and Partner Diagnosis, and the two-way interactions between them. Random effects for participant and partner were also modelled.

Contrary to previous results, mixed and matched neurotype dyads achieved similar rapport, regardless of modality ($\text{Beta} = .03$, $\text{df} = 314$, $p = .64$). Autistic partners received lower rapport ratings, regardless of Dyad Type and Modality ($\text{Beta} = -.26$, $\text{df} = 56.67$, $p < .05$). Additionally, autistic participants reported experiencing marginally less rapport, regardless of Dyad type and Modality ($\text{Beta} = -.25$, $\text{df} = 66.32$, $p = .06$). Both autistic and non-autistic participants reported greater levels of rapport following in-person, compared to online interactions ($\text{Beta} = 0.31$, $\text{df} = 4.51$, $p < .001$).

Conclusions:

Inconsistent with the Double Empathy Problem, we found no evidence of rapport benefits for matched compared to mixed neurotype interactions. The current study is the first to employ a within-subject design to investigate DEP, providing greater experimental control and power in comparison to previous research, which may explain the contradictory results found. These results are consistent with work that demonstrates that autistic individuals are subject to first impression biases (Sasson et al., 2017) and suggests these biases may extend to short interactions. We also found that greater rapport was achieved after in-person interactions, suggesting online interactions do not improve the DEP as previously suggested (Marsh et al., in prep). DEP assumes autistic matched interactions are beneficial, however, this maybe too simplistic when considering the complex nature of social communication. Future research should consider nuanced individual differences in communication rather than group-level diagnostic differences. Further work is ongoing to investigate the impact of conversational alignment, use and synchrony of facial expressions, and camouflaging on rapport.

302.003 Automatic Detection of Communication Difficulties in Neurodiverse Group Conversations

C. Kobayashi¹, I. Hoshina¹, T. Sakato¹, M. Tsujii^{1,2}, F. Nihei³, C. Takayama³, R. Ishii³, K. Stefanovi^{1,4} and Y. Nakano¹, (1)Seikei University, Musashino-shi, Tokyo, Japan, (2)Chukyo University, Nagoya-shi, Aichi, Japan, (3)NTT Human Informatics Laboratories, NTT Corporation, Yokosuka-shi, Kanagawa, Japan, (4)Monash University, Clayton, VIC, Australia

Background: Recent advancements in AI technologies, particularly in deep learning, have demonstrated surprising performance for identifying and recognizing patterns in large amounts of data. Aiming to show the effectiveness of deep learning techniques in analyzing social interaction between individuals with autism spectrum disorder (ASD) and neurotypical individuals, this study applies deep learning methods to detect communication difficulties that arise in communication between ASD individuals and neurotypical ones.

Objectives: To propose a deep learning technique for detecting communication difficulties in neurodiverse group conversations involving ASD individuals and neurotypical ones.

Methods: A total of 22 neurodiverse group conversations were collected from 11 groups, each consisting of three participants: one ASD individual and two neurotypical individuals. The average age of ASD participants was 29.6 years. The conversation corpus contained 12,016 utterances. Communication difficulties were categorized into two main types: "interaction maintaining", "smoothness of communicative behaviors".

"Interaction maintaining" was sub-categorized into three aspects: engagement (whether ASD individuals were properly engaged in the conversation), turn-taking (whether their turn-taking behaviors were performed appropriately), conversation context (whether their utterances were contextually relevant). "Smoothness of communications behaviors" was also sub-categorized into two aspects: verbal (e.g. word choice, sentence structure), nonverbal (e.g. speech prosody, facial expressions). Based on these categories, deep learning models were created to estimate communication difficulties in terms of (1) engagement, (2) interaction maintaining, and (3) smoothness of communicative behaviors. Additionally, putting all categories together, we defined (4) all-categories to detect any type of communication difficulty across all categories. Four types of features were used as training data: audio features (Audio), language features (Lang), facial expression features of the speaker (Face-sp), and facial expression features of all participants (Face-all). Transformer-based deep learning models were created by fusing these four types of features to perform binary classification (whether a difficulty was detected or not) across the four aspects: (1), (2), (3), (4) as described above.

Results: We created four unimodal models, each trained on only one of the four types of features and one multimodal model that combined Audio, Lang and Face-sp features. The performance of these models was evaluated on test data using F1-score and accuracy as metrics. The highest accuracy was achieved by the audio unimodal model in detecting any communication difficulties across categories ((4): all-categories), with an accuracy of 0.652. Moreover, models using Face-all features outperformed those using Face-sp features.

Conclusions: This study proposed deep-learning techniques to detect four types of communication difficulties in neurodiverse group communications. The evaluation of models leveraging different modalities revealed that the audio unimodal model, in detecting any communication difficulties across categories, achieved the highest accuracy: 0.652.

302.004 Leveraging and Validating an Online Group Interaction Paradigm to Understand Friendship-Making in Autistic Adolescents

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Background: While research affirms the importance of friendships in autistic youth (Mendelson et al. 2016), *in vivo* friendship-making assessment techniques for this population are lacking. Likewise, little work has explored the *unique* ways in which autistic individuals form friendships (Black et al. 2024), and how this may relate to enduring peer relations. This is particularly important given the rise of online spaces as a modality for socialization in youth. As such, an accessible, engaging online *in vivo* peer interaction paradigm that can provide differential insight regarding friendship-making in autistic youth is needed.

Objectives: 1) Evaluate relations between friendship-making in a brief, novel online paradigm and external friendships in adolescents, and 2) Evaluate differences in these patterns between autistic and non-autistic youth.

Methods: Mixed groups of autistic and non-autistic adolescents participated in a novel Virtual Game Night (VGN) paradigm (Table 1). Groups ($k = 6$) comprised of autistic and non-autistic (min = 2 each) youth attended VGNs together. Paralleling the structure of in-person peer interaction paradigms (e.g., McNair et al., 2023), VGN involved 20 minutes of unstructured interaction and snack, 15 minutes of a minimally-verbal online game, and 15 minutes of a verbally-mediated online game. VGN participants completed a sociometric procedure (Coie et al., 1982) regarding friendship-making in the group. Separately, participants and parents completed the adolescent/parent friendship questionnaire (A/PFQ; Beristain & Wiener, 2020) regarding their external friendships (i.e., “real-world” friendships). Correlations between sociometrics and A/PFQ were examined overall and in the diagnostic subgroups; moderation analyses examined whether such relations were specific to these groups.

Results: Youth whose VGN peers indicated a lower desire to play with them again reported more online and phone contact with external friends, and those whose VGN peers less frequently indicated they became friends (overall, top, and reciprocated) reported *more* in-person contact with external friends, with a similar pattern seen for total number of friends (Table 1). Moderation (Figure 1) analyses revealed these effects to be largely *specific to non-autistic youth*. However, several effects were *specific to autistic youth*: those whose VGN peers reported they liked them *the most* reported more external friends (with this effect corroborated by parent-report), and more in person contact with these friends.

Conclusions: This study provides the first evidence of the utility of a novel, online peer interaction paradigm as an index of friendship-making in youth. Results reveal a unique set of relations among autistic versus non-autistic youth, suggesting that non-autistic youth with more external friends – and more active, multimodal contact with those friends – may have less effectively engaged in the VGN to make new friends.

However, autistic youth with *more* external friends and active in-person contact them may more effectively translate these experiences to become more liked in the VGN. This suggests effective, autistic-specific ways that autistic youth translate social strategies into online settings to build friendships. Overall, these findings highlight the utility of the VGN, and provide novel insights into how friendships are formed – both initially online and more durably – in autistic (and non-autistic) youth.



Oral Session -

303 - Sleep Problems: From Brain to Behavior to Clinical Measurement

May 1st, 2025, 2:00 PM - 3:00 PM - 6A

Moderator: Annette Estes, Speech and Hearing Sciences, UW Autism Center, Seattle, WA

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303.001 Sleep Problems in Autistic Children at the Time of Psychiatric Hospitalization in Relation to Parenting Stress and Parental Self-Efficacy: Moderation By Child Autism Symptoms and Parental Resources

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Background: Sleep problems are common and detrimental to children with autism and their families. Converging research shows that sleep problems contribute to daytime behavior problems in children with autism and even predict psychiatric hospitalization. In addition, sleep problems can have a profound impact on parents, the primary agents of child behavior management, by increasing parenting stress and reducing parental self-efficacy. Here, we examine the relationship between child sleep problems at the time of psychiatric hospitalization in relation to parent stress and self-efficacy, to evaluate what factors may buffer or exacerbate the effects of sleep problems on parent outcomes. Identifying protective and exacerbating factors may inform the development of specialized interventions to mitigate the impact of child sleep problems on family functioning. **Objectives:** (1) Which sleep problems in children with autism are associated with indices of parenting stress and self-efficacy? (2) What factors moderate associations between child sleep problems and indices of parenting stress and self-efficacy?

Methods: Participants were parents of 479 autistic children (ages 12.1 ± 3.2 , 81% male) with admitted to a psychiatric inpatient unit participating in the Autism Inpatient Collection, a multi-site study of six specialized inpatient units. Multivariate analysis was performed to examine the effects of sleep problem profiles (i.e., sleep initiation problems, sleep maintenance problems, and both sleep initiation and sleep maintenance problems) on indices of parenting stress (i.e., parental distress, parent-child dysfunctional interactions, and the perception of the child as difficult) and self-efficacy, controlling for child age, child sex, parental marital status, household income, child's verbal ability, autism severity, and the presence of co-occurring intellectual disability.

Results: All types of sleep problems were associated with greater parent perception of the child as difficult (Table 1). Sleep maintenance problems were also associated with more parental distress and more parent-child dysfunctional interaction. Parent marital status and household income moderated effects of sleep problems on parent self-efficacy such that sleep problems were associated with less parent self-efficacy in single parents (p -values <0.01) and in those making less than \$50,000 per year (p -values <0.001). Autism severity and co-occurring intellectual disability also moderated the effects of sleep on the perception of the child as difficult such that sleep problems were associated with greater perception of the child as difficult for children with high autism severity (p -values <0.05) and those with co-occurring intellectual disability (p -values <0.05).

Conclusions: Sleep problems, particularly frequent nighttime awakenings, increase parenting stress. The detrimental impact of sleep problems appears to be compounded when the child has more significant autism symptoms, increasing a parent's sense that their child is difficult to care for. Greater social and financial resources may buffer against the detrimental impact of sleep problems on parent self-efficacy, as sleep problems may deplete self-efficacy for single parents and those with lower incomes. Child sleep problems are a family system-level issue and future studies are needed to examine family level solutions.



303.002 Hippocampal Volume and Sleep Problems in School-Aged Children at High and Low Familial Likelihood of Autism

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Background: Healthy sleep during childhood is vital to health, cognition, and brain development. Some of the same subcortical regions associated with altered brain development in autistic children are also associated with sleep problems. The Infant Brain Imaging Study (IBIS) has previously reported that sleep problems are associated with enlarged hippocampal volumes in infant siblings later diagnosed with autism. However, it is unclear whether the relationship between sleep problems and hippocampal alterations persist in autistic school-age children, even though clinically significant sleep problems affect over 80% of the population at this age.

Objectives: To examine the relationship between hippocampal volume and sleep characteristics in school-aged children (7.0-11.11 years) at higher familial likelihood of Autism Spectrum Disorder (ASD) with an autism diagnosis (HL-ASD), no diagnosis (HL-noASD), and lower familial likelihood of autism (LL).

Methods: Hippocampal volumes were measured from awake MRI T1 and T2 images (Siemens 3T Prisma) across 4 sites (University of North Carolina, Washington University, Children's Hospital of Philadelphia, University of Washington) utilizing all available data that has passed QC to date. Left and Right Hippocampal volumes were highly correlated, so total volume is reported here. Sleep was measured with actimetry in the home for 10 days (Phillips Actiwatch and sleep diaries). Children with actimetry within 6 months of MRI were included (HL-ASD $n=11$; HL-noASD $n=36$; LL $n=35$). Sleep variables included average sleep duration (minutes), sleep duration variability (intra-individual standard deviation of sleep duration), average sleep efficiency (proportion of total time spent sleeping/total time spent in bed), and sleep efficiency variability (intra-individual standard deviation of sleep efficiency).

Results: Our findings revealed a significant relationship between enlarged hippocampi and sleep duration variability in both the HL-ASD and HL-noASD groups, adjusting for total brain tissue volume (see Table 1). No significant associations between hippocampal volume and average sleep duration, average sleep efficiency, or sleep efficiency variability were observed. Future analyses will evaluate other subcortical structures to determine whether this relationship is specific to the hippocampus and will include additional children as scans that pass QC become available.

Conclusions: Greater sleep duration variability was associated with larger bilateral hippocampal volume in school-aged children with higher familial likelihood of autism. This was observed in HL children with and without an autism diagnosis. Variability in sleep duration is an under-recognized index of insomnia and sleep dysregulation, which are commonly observed in autism. Sleep duration averages have been a major focus of sleep research, but variability is also important to consider, especially in studies that take place over multiple days. Averages over multiple days can mask the types of sleep problems seen in insomnia and sleep dysregulation, whereas variability captures these real-world sleep challenges. Investigating brain-sleep relationships has the potential to reveal the developmental impacts of sleep problems in this vulnerable population.



303.003 Factor Structure of the Sleep Disturbance Scale for Children in a Cohort of Youth with Autism

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Background: Despite the substantial evidence base for poor sleep in autism, sleep problems are frequently under-identified and inefficiently managed. This is, in part, due to available screening tools failing to comprehensively capture the specific sleep phenotypes in autism. The Sleep Disturbance Scale for Children (SDSC) is one of the highest ranked pediatric sleep assessment tools and is thus a highly promising instrument across research and clinical contexts. However, despite comprehensiveness and promising psychometric properties, the SDSC is scarcely used in autism research. Consequently, the utility of the SDSC for identifying sleep disturbances in autism remains unknown.

Objectives: To explore the factor structure of SDSC in a sample of youth with autism and characterize the associations between derived subscales with key demographic, cognitive, and clinical correlates.

Methods: 513 autistic youth, aged 3-18 years (mean: 10.47 years; SD: 3.71; 18.7% female) were drawn from the Healthy Brain Network secondary dataset. Fit of the previously derived SDSC factor structure was appraised using the confirmatory application of the exploratory structural equation modeling (C-ESEM). Fit was evaluated based on the following statistical parameters: comparative fit index (CFI), Tucker-Lewis Index (TLI), root mean square error of approximation (RMSEA) and standardized root mean square residual (SRMR). Associations between derived factors with age, sex, IQ, and emotion regulation were explored.

Results: A range of previous factor models, including 5-factor and 6-factor solutions were tested. Five-factor solution comprising disorders of initiating and maintaining sleep, disorders of arousal (DoA), disorders of excessive somnolence (DoES), sleep breathing disorders (SBD), and sleep-wake transition disorders (SWTD) showed excellent fit (CFI= .973; TLI= .955; RMSEA= .043 [90% CI: .033, .051], SRMR= .051). Item-level analysis suggested two items that were originally hypothesized to load onto the SWTD factor loaded onto the DOA factor, thus, the model was re-specified and additional C-ESEM was run, resulting in a comparable fit with all items loading significantly onto the intended factors. Derived factor solution was stable across sex and age. Internal consistency and model reliability of identified factors were both in the good to excellent ranges, indexed by Cronbach's Alpha and McDonald's Omega values of $\geq .79$. SWTD and sleep hyperhidrosis factors showed significant negative ($r = -.166, p < .001$ and $r = -.191, p < .001$, respectively) and DoA significant positive ($r = .147, p < .001$) associations with age. None of the SDSC subscales were associated with sex or FSIQ. All subscales were significantly associated with emotion dysregulation. DoES ($r = .466, p < .001$) and SWTD ($r = .403, p < .001$) subscales showed the highest associations with internalizing problems, while externalizing problems showed the strongest association with SWTD ($r = .316, p < .001$).

Conclusions: This study provides the first validation of the SDSC in a large sample of well-characterized youth with autism. Notably, the SDSC subscales showed distinct patterns of associations with key clinical correlates, namely age and emotion regulation. Findings are consistent with independent reviews suggesting the SDSC may provide a more effective way to screen for sleep disturbances in individuals with autism, with the potential to advance targeted and individualized treatments.

303.004 Comparing the Relationships between Internalizing and Externalizing Behaviors and Sleep in Autistic and Non-Autistic Youth

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Background: Sleep in autism spectrum disorder (ASD) is often highly disrupted, affecting up to 80% of children. Sleep problems are commonly associated with internalizing and externalizing behaviors, with bi-directional relationships noted in both children with ASD and non-autistic controls. Specifically, sleep problems may predict internalizing and externalizing behaviors in children, while these behaviors may also contribute to sleep problems. Despite the known relationships between these behaviors and sleep disturbances, there are few studies directly comparing these associations between children with ASD and non-autistic controls. Understanding the patterns of these relationships may aid in the modification of existing sleep interventions for children with ASD.

Objectives: This study aimed to use a multi-method approach to capture the relationships between internalizing and externalizing behaviors and domains of sleep between children with ASD and non-autistic controls.

Methods: Data for this study is part of the ongoing NIH Autism Center of Excellence for Sleep. To date, data has been collected from 20 non-autistic participants (75% male) and 50 participants with ASD (74% male), aged between 4 and 17 years (Mean age = 10.71, standard deviation = 3.65). Autism diagnosis was confirmed using the Autism Diagnostic Interview and the Autism Diagnostic Observation Schedule. Sleep was evaluated using the Child Sleep Habits Questionnaire (CSHQ), while internalizing and externalizing behaviors were assessed with the Child Behavior Checklist (CBCL) and Aberrant Behavior Checklist-Community (ABC-C).

Results: Group comparisons showed significantly higher scores on all subscales of the CSHQ ($p < .01$) for the ASD group, except for the bedtime resistance and sleep onset delay subscales ($p > .05$). Furthermore, a significantly higher proportion of individuals with ASD (90%) had a CSHQ total score above the clinical cut-off compared to controls (55%; $p < .05$). The ASD group also had significantly higher scores on the internalizing and externalizing domains of the CBCL and all subscales of the ABC-C ($p < .05$). Significant relationships were observed between internalizing and externalizing behaviors and sleep anxiety in the non-autistic group (Table 1), while externalizing behaviors (CBCL, hyperactivity, and irritability) were associated with parasomnias in the ASD group, after controlling for age (Table 2). Interestingly, Z-tests on Fisher z-transformed correlation coefficients found the relationships between parasomnias and externalizing behaviors, and sleep anxiety and internalizing and externalizing behaviors significantly differed between the two groups ($p < .05$).

Conclusions: Using a multi-method approach, we have highlighted differences in the patterns of relationships between sleep problems and internalizing and externalizing behaviors in children with ASD compared to non-autistic controls. These different patterns of results were apparent, despite the high rate of sleep problems, comparable to behavioral insomnia, observed in the non-autistic group. These results build upon the existing literature highlighting the nuanced relationships between sleep and internalizing and externalizing behaviors in children with ASD. Our study underscores the importance of interventions that target both underlying emotion regulation challenges and sleep problems simultaneously in order to improve outcomes in children with ASD.



Oral Session -

304 - New Findings in Autism Epidemiology

May 1st, 2025, 2:00 PM - 3:00 PM - 611-614

Moderator: Maureen Durkin, *Population Health Sciences, University of Wisconsin-Madison, Madison, WI*

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304.001 The Impact of Urban Living Environments on Autistic Traits and Autism Spectrum Disorder: An Exposome-Wide Study in Two Chinese Cohorts

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Background: Individuals are simultaneously exposed to various environmental factors that might combine to influence human health. Although specific urban factors, such as air pollution, has been linked to autism spectrum disorder (ASD) using a one-exposure-to-one-outcome approach, no study has captured the complexity of real-life exposures in relation to ASD.

Objectives: This study systematically evaluates the impacts of a wide range of urban exposures during pregnancy using an exposome-wide approach, aiming to identify the most relevant combinations of environmental factors (environmental profiles) associated with autistic traits and ASD, as well as to determine the contribution of each factor within these profiles.

Methods: This study included 1,610 typically developing children from the Shanghai Birth Cohort (SBC), with autistic traits assessed at age 4 using a Chinese version of the Social Responsiveness Scale-Short Form (SRS-SF). We also established a matched case-control study comprising 387 pairs of ASD and non-ASD children, matching ASD children from the Shanghai Autism Early Developmental (SAED) cohort with those in SBC by sex and birth year. ASD in the SAED cohort were diagnosed by qualified professionals. We evaluated 16 urban environmental factors based on residential address, including 11 air pollution indicators, 1 sound pollution measure, 1 night light pollution factor, and 3 residential green space metrics. The analysis comprised two steps: first, a single exposure analysis to assess the impact of each factor; second, a multi-exposure analysis utilizing principal component analysis (PCA) to identify distinct urban environmental profiles and their associations with autistic traits and ASD. The PCA was performed on data from the SBC to capture distinct environmental profiles. The loadings from the PCA were then applied to the case-control sample to calculate profile scores. Poisson and logistic regressions were used to investigate the association between each factor and environmental profile with SRS-SF score in the SBC and the odds of ASD in the case control study, respectively.

Results: Single-exposure analysis revealed significant associations of PM_{2.5-10}, NO₂, PM_{2.5} constituents (black carbon and sulfate), UFP, noise, and lack of green space with increased autistic traits, particularly in social communication and ASD-like behaviors. Among these factors, high levels of PM_{2.5-10}, NO₂, UFP and noise as well reduced green space were further linked to increased odds of ASD. Light at night exhibited the strongest impact on ASD odds, although it did not show a significant association with autistic traits. In the multi-exposure analysis, PCA extracted four profiles explaining over 85% of the variation of the total environmental factors. The first three profiles were significantly associated with increased autistic traits, while the fourth, characterized by higher soil levels, correlated with lower traits. The second profile, characterized by high light at night, UFP, noise, and limited green space, demonstrated the most substantial impact on ASD across different trimesters.

Conclusions: Our study provides compelling evidence that urban environmental factors affecting autistic traits and ASD. It emphasizes the relevance of specific environmental profiles in understanding ASD influences, suggesting that a comprehensive approach to urban planning and environmental management could be crucial for mitigating these effects.

**304.002** The Association between Clinically Diagnosed Neonatal Jaundice and Autism: A Swedish Register-Based Cohort Study.

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Background: Neonatal jaundice may increase the likelihood of autism through bilirubin-induced neurotoxicity, which can reduce Purkinje cells essential for cerebellar function. Cerebellar hypoplasia, marked by fewer Purkinje and granule cells, is observed in some newborns later diagnosed with autism. The association between neonatal jaundice and autism is particularly challenging to elucidate due to the influence of numerous prenatal and neonatal confounders.

Objectives: We aimed to assess whether neonatal jaundice increases the risk for autism while accounting for confounding of perinatal factors.

Methods: We conducted a population-based cohort study using data from Swedish national registers, including the Medical Birth Register (MBR), National Patient Register (NPR), and others, covering individuals born in Sweden between 1992 and 2010 (N=1,669,839). The study excluded stillbirths, multiple births, severe congenital malformations, and individuals who died or emigrated before age 3. Participants were followed from age 3 until death, emigration, autism diagnosis, or December 31, 2013.

Neonatal jaundice, identified using ICD-9/ICD-10 codes, was the primary exposure. The outcome was a clinical autism diagnosis after age 3. Cox proportional hazards regression was used to estimate hazard ratios (HRs) and 95% confidence intervals (CI), adjusting for covariates such as sex, gestational age, birthweight, parental age, and socioeconomic factors. We applied both separate and incremental adjustments to assess the influence of each covariate.

Results: The study population included 1,685,321 individuals, with 39,934 (2.39%) diagnosed with neonatal jaundice and 21,038 (1.25%) diagnosed with autism, of whom 662 (0.04%) had both conditions. Neonatal jaundice was more common in preterm, low birthweight, and cesarean-delivered infants. The mean follow-up for those with jaundice was 8.53 years, 0.76 years shorter than those without. In the crude Cox regression, neonatal jaundice was associated with a higher likelihood of autism diagnosis (HR=1.48, 95% CI: 1.37-1.60). In adjusted models, gestational age (HR=1.11, 95% CI: 1.02-1.22) and birthweight (HR=1.18, 95% CI: 1.09-1.29) attenuated this association, reducing the HR to 1.05 (95% CI: 0.96-1.15) when all covariates were accounted for.

Sensitivity analysis revealed that preterm children had the lowest likelihood of being diagnosed with autism, while post-term infants had the highest. Hemolytic jaundice showed no increased likelihood, whereas non-hemolytic jaundice was initially associated with autism but lost significance after adjusting for gestational age and birthweight.

Conclusions: Our results highlight the importance of adjusting for confounders when investigating early life factors and autism, which may not always be genetic or familial.



304.003 Life Expectancies for Medicaid Beneficiaries with Autism Spectrum Disorder in the United States, 2000-2020

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Background: The existing epidemiologic evidence suggests that the overall mortality risk for people with autism spectrum disorder (ASD) is 2 to 3 times the risk in the general population. Although reduced life expectancy was first speculated in the early 1990s, research on mortality and lifespan issues in ASD remains scarce.

Objectives: Calculate life expectancies for Medicaid beneficiaries with ASD during 2000 through 2020 and compare them with all Medicaid beneficiaries and the US general population.

Methods: Medicaid is the largest health insurance program in the US and the primary public insurance program for people with ASD. Research-identifiable files from Medicaid (i.e., Medicaid Analytic eXtract data files and T-MSIS Analytic Files), and the enhanced mortality data (i.e., mortality data through linkage of Medicaid beneficiaries to the National Death Index) from 2000 to 2020 were analyzed to determine age-specific death rates for beneficiaries with ASD. The standard life table method was used to calculate life expectancies for Medicaid beneficiaries with ASD, which were compared with life expectancies for all Medicaid beneficiaries and the US general population as reported by the Centers for Disease Control and Prevention.

Results: During the 21-year study period, we identified a total of 18,268 deaths among Medicaid beneficiaries with ASD over 8,246,921 person-years, yielding an overall death rate of 221.5 per 100,000 person-years. Life expectancies at birth for Medicaid beneficiaries with ASD increased from 64.1 years during 2000-2004 to 65.8 years during 2015-2019, whereas life expectancies increased from 67.9 years to 72.9 years for all Medicaid beneficiaries, and from 77.3 years to 78.6 years for the US general population (Figure 1). In 2020, life expectancies decreased 4.1 years in Medicaid beneficiaries with ASD, 2.6 years in all Medicaid beneficiaries, and 1.6 years in the US general population, compared to the 2015-2029 period (Figure 1). Among Medicaid beneficiaries with ASD, males had almost identical life expectancies as females (Figure 2). In contrast, females in the Medicaid population and the general population had 5 to 7 years longer life expectancies than males (Figure 2).

Conclusions: Due to heightened mortality rates, people with ASD have substantially shorter life expectancies than the Medicaid population and the general population. The reduced life expectancy among those with ASD is more pronounced for females than for males. The COVID-19 pandemic appears to have had a much greater adverse effect on life expectancy for people with ASD than for the general population.



304.004 The Effects of the COVID-19 Pandemic at the Age of 3 on 5-Year-Old Children with ASD

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Background:

The children's brains are susceptible to both positive and negative influences from their environments. Early childhood is an important period for developments of emotion, language and impulse control so on. Many toddlers spent their crucial period under the COVID-19 pandemic, and the impact on their development is still unclear, especially children with Autism spectrum disorder (ASD).

Objectives:

To assess the effects of the pandemic at the age of 3 on brain development, this study investigated whether there were differences in development at age 5 between children who were exposed to the pandemic at age 3 and those not exposed at age 3.

Methods:

Subjects were recruited from participants who attended both the 3-year-old developmental checkup in Hirosaki City, Japan, from 2018 to 2022, and the comprehensive assessment stage of 5-year-old developmental checkup in the same city from 2020 to 2024. The latter consists of 2 stages: the initial screening stage and the comprehensive assessment stage. In the screening stage, caregivers fill out the Autism Spectrum Screening Questionnaire (ASSQ) and the Strengths and Difficulties Questionnaire (SDQ-P), and teachers also fill out the SDQ(SDQ-T). The SDQ subscales are Emotional Symptoms(ES), Conduct Problems(CP), Hyperactivity/Inattention(HI), Peer Problem(PP), Prosocial Behavior(PB), and total difficulties score(TDS). In the latter stage, caregivers fill out Social Responsiveness Scale Second Edition(SRS-2), and children underwent the Japanese version of Wechsler Intelligence Scale for Children-Fourth Edition (WISC-IV), one of its subscales is Verbal Comprehension Index(VCI). The child psychiatrists diagnosed ASD based on DSM-5. Since the state of emergency was declared in Japan in April 2020, we had divided the children into two groups: children who participated in the 3-year-old checkup before April 2020, the Pre-pandemic group; children who participated after April 2020, the under-pandemic group (Fig.1). Statistical analysis were performed using Shapiro-Wilk test, Levene test, Independent-samples t-test, and Mann-Whitney U test ($p<0.05$).

Results:

524 children and their caregivers participated in and consented to this study. The number of children with ASD was 160. There were significant differences between the two groups on the 5-year-old SDQ-P_ES ($p=.026$), SDQ-T_ES($p=.003$), SDQ-T_HI($p=.005$), and SDQ-T_TDS($p=.001$). Surprisingly, the SDQ-P_ES of the under-pandemic group was lower than that of the pre-pandemic group, meaning that children who were at age 3 during under the pandemic had fewer emotional problems than children who were at age during the pre-pandemic(Fig.2). SDQ-T_ES, SDQ-T_HI, and SDQ-T_TDS were higher in the under-pandemic group. There was a significant difference in VCI between the two groups.. Focusing on children with ASD, SDQ-T_ES ($p=.004$), SDQ-T_HI($p=.017$), and SDQ-T_TDS($p=.011$) of children with ASD who were at age 3 during pandemic were significantly higher than those who were at age 3 during pre-pandemic(Fig.3,4). There was no significant difference in VCI between the two groups.

Conclusions:

This study suggested that the pandemic might had negatively affected the development of emotion and impulse control outside the home in children with ASD, and positively affected the development of emotional control at home and language in children without ASD. We need to follow the long-term effect of the pandemic on child developments.

**Oral Session -**
305 - Characterizing Individual Differences in Autistic Cognition: Implications for Clinical Characterization and Longitudinal Outcomes

May 1st, 2025, 2:00 PM - 3:00 PM - 608-609

Moderator: Cory Shulman, *The School of Social Work, Profile Resources Group, Jerusalem*

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305.001 Eyes Wide Open: Exploring Eye Tracking As a Tool for ASD Diagnostics and Clinical Characterization

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Background:

Despite the clear biological differences in autism, diagnosis has relied on somewhat subjective DSM criteria for 80 years. Studies indicate that eye-tracking may serve as an effective screening and diagnostic tool, providing objective metrics that are quick to implement and require minimal training. However, eye-tracking for ASD diagnostics faces challenges such as opaque 'black box' bioinformatic analyses, inadequate inclusion of non-ASD delay children, small sample sizes, unclear relationships between eye-tracking data and symptom severity, and limited independent datasets for generalization. Given toddlers' short attention spans, it is vital to explore the effectiveness of eye-tracking across various time periods and paradigms that assess attention to visual social information, social speech (e.g., 'Baby Talk'), and shifting attention, as these domains synergistically promote social development.

Objectives:

- (1) Assess the efficacy of eye-tracking as a diagnostic biomarker tool by leveraging ET paradigms that span multiple social attention domains and include large sample sizes and non-ASD delay subjects.
- (2) Evaluate the utility of an Autism Score based on ET performance as a reliable index of clinical phenotype and symptom severity.
- (3) Compare the accuracy of simple threshold-based classifier (STC) versus more advanced machine learning (ML) classifiers.

Methods:

Using the *Get SET Early* model for recruitment, 2,489 toddlers (N=1,191 ASD, 616 TD, 682 non-ASD delays, aged 12-48 months) participated in 1-6 eye-tracking (ET) tests resulting in 5,428 datasets (**Figures 1-2**). Clinical evaluations were conducted by psychologists blind to ET results. ET metrics included % fixation non-social, saccades per second, total looking time, and child factors such as sex, age, and parental concern. Standard classification metrics were compared between an explainable simple threshold-based classifier (STC) using a 69% fixation threshold on non-social and a 24% fixation on non-target objects during joint attention—in comparison to a comprehensive set of 18 ML classifiers. An Autism Score was generated using both STC and ML classifiers, and relationship with clinical features examined.

Results:

Across both approaches, specificity and positive predictive value (PPV) were high, even with shorter durations and just one eye-tracking test. For instance, the STC approach revealed GeoPref Test specificity of 97% in both the primary (N=1,789) and independent (n=448) datasets. However, this high specificity was associated with low sensitivity, at 19% and 17% respectively. Sensitivity increased with more diverse eye-tracking tests, reaching its peak with five and six tests that assessed all three domains: visual, auditory, and shifting attention. In these cases, sensitivity, specificity, and PPV were 56%, 89%, 92% and 61%, 100%, 100% in the primary dataset and test sets, respectively. The best ML classifier, Logistic Regression, achieved values of 74%, 82%, 90% and 79%, 100%, 100% in the primary and test sets, respectively. Preliminary analyses indicated significant correlations between the autism score and clinical phenotype.

Conclusions:

Given the speed and accuracy of ET based diagnostic classification, combined with its utility with young toddlers, eye-tracking has the potential to transform early identification practices. Leveraging a range of eye-tracking tests that quantify different aspects of social attention may be particularly valuable for understanding subtypes and enhancing sensitivity.



305.002 Exploring Sex Differences in Multi-Domain Neurocognitive Performance in Autistic Children: A Cross-Sectional Case-Control Study

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Background:

Neurocognitive function plays a crucial role in neurodevelopmental disorders, with documented sex differences in autism. However, understanding these differences amid co-occurring psychopathology remains challenging. Clarifying sex-specific neurocognitive patterns could shed light on symptom expression and prognostic variations in autistic individuals.

Objectives:

This study aims to explore sex differences in neurocognitive functioning among autistic children.

Methods:

A cohort of prepubertal children with and without autism underwent extensive phenotyping on clinical symptoms and multi-domain neurocognitive function. Co-occurring attention deficit and hyperactivity disorder (ADHD) was clinically assessed, while anxiety symptoms were evaluated using the parent-rated Anxiety Scale for Children-Autism Spectrum Disorder scale. Neurocognitive functions were assessed using the Penn Computerized Neurocognitive Battery (CNB), comprising 1 motor praxis task and 12 domain-specific tasks. Performance metrics included speed and accuracy for the domain tasks and only speed for the motor praxis task. Speed and accuracy of domain-specific tasks were z-transformed before being summarized with factor analysis into 3 speed (Memory, Deliberative and Rapid) and 3 accuracy (Memory, Social and Executive/Complex Cognition) factor scores. ANCOVA was used to examine the main effects of autism, sex and their interaction on the cognitive performance, and controlled for age, anxiety symptoms and ADHD diagnosis.

Results:

The study compared 636 autistic children (Mean age = 8.4 years; Male:Female ratio = 6.8:1; 58.5% females and 51.6% males with co-occurring ADHD) against 412 non-autistic children without psychiatric history (Mean age = 8.6 years; Male:Female ratio = 1.2:1). Female sex and autism were separately linked to slower reaction times in the motor praxis task [$F(1,984) = 8.29, p = 0.004$; $F(1,984) = 9.53, p = 0.002$, respectively], while only female sex exhibited slower responses in Rapid tasks [$F(1,981) = 8.29, p = 0.004$]. Autistic children had poorer accuracies across all 3 cognitive domains: Memory [$F(1,985) = 23.56, p < .001$]; Social [$F(1,985) = 20.33, p < .001$]; Executive/Complex Cognition [$F(1,985) = 4.15, p = 0.042$]. A significant Diagnosis x Sex interaction was observed in the accuracy scores of Executive/Complex Cognition [$F(1,985) = 4.06, p = 0.044$], with autistic males showing the greatest impairment (Figure 1).

Conclusions:

Our findings, with robust controls for confounders, highlight significant sex differences among autistic children in the domain of Executive/Complex Cognition. The distinction may shape the differential developmental trajectories in autistic males and females, given the role of higher-order cognitions in compensation and camouflaging.



305.003 Long-Lasting Effects of Pre-K Education on Autistic Children's Working Memory and Reading Development

S. A. Kim, *School of Education and Information Studies, University of California Los Angeles, Los Angeles, CA*

Background:

Reading is widely accepted as a critical foundation for long-term school outcomes, but autistic children are more likely to struggle with reading comprehension than their neurotypical peers, peers with a learning disability or dyslexia. Successful reading development begins with strong foundational skills such as working memory (WM), which involves sustaining attention and mentally manipulating information. Many autistic children have difficulties with WM, therefore exploring ways to strengthen WM in autistic children through educational opportunities can be a critical step in fostering long-term reading success.

In the United States, many states are offering state-funded Universal Pre-Kindergarten (pre-K) programs for preschool-age children. Evidence suggests that pre-K education equips young children with necessary school readiness skills in general. However, it is unclear to date if pre-K education influences long-term development in WM and reading in autistic children in particular.

Objectives:

This project first examines the longitudinal benefits of pre-K education on the development of WM and reading skills for all children in general, and if pre-K education is particularly beneficial for autistic children. Secondly, it examines the mediating role of autistic children's WM on the longitudinal relationship between pre-K education and their reading development.

Methods:

Using the licensed version of a nationally-representative dataset (ECLS-K:2011) that followed the same cohort of children from kindergarten to 5th grade in the United States ($N \approx 18,170$), a series of multiple regression, interaction analyses, and a mediation analysis were conducted. Of the analytic sample, approximately 310 students were identified as having autism.

Results:

For the general sample, having attended pre-K predicted advanced reading and WM skills upon school entry, yet such benefits faded away after 2-3 years. However, particularly for autistic children, the onset of such benefits started a few years after they started kindergarten, but lasted longer, until end of their elementary school years (spring of 5th grade). Finally, autistic children's WM in 3rd grade mediated the longitudinal relationship between pre-K attendance and their reading skills in 5th grade.

Conclusions:

The current study directs us to look beyond the intrinsic autism characteristics to recognize the role of the learning environment at preschool ages on their longitudinal development. Findings provide us with promising evidence that participating in school-based programs prior to entering kindergarten may produce long-lasting benefits in WM development for autistic children, which in turn foster reading success. The current findings have implications for teachers and parents in that "cognitive endurance" must be promoted when educating children on the autism spectrum. It may be erroneously perceived that autistic children are making limited progress if such a conclusion is based on their short-term gains, which can potentially lead to learned helplessness. However, the above findings demonstrate that autistic children may be undergoing a pattern of cognitive development that is different from their non-autistic peers. In other words, autistic children may be making slower but more steady progress, and pre-K education may be producing a long-lasting and robust influence on autistic children's WM and reading development through socially enriched learning environments.

305.004 The Remote Infant Studies of Early Learning (RISE) Battery for the Assessment of Cognitive and Language Development in Infants at Elevated Likelihood for Autism

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Background: To understand developmental processes that occur prior to an autism diagnosis, researchers often study infant-siblings of autistic children. Even in this high likelihood group, five times the target sample must be recruited for the relevant number of autistic participants. Given the heterogeneity of autism, we need methods appropriate for large samples to increase our understanding of early developmental mechanisms. To address this need, we created the Remote Infant Studies of Early Learning (RISE). The RISE battery includes remote tasks assessing cognitive and language skills that are likely sources of heterogeneity in autism.

Objectives: (1) Test the feasibility of remote administration of tasks for social attention, memory, prediction, word comprehension and audiovisual synchrony (Figure 1). (2) Assess group differences between infants with and without an autistic sibling.

Methods: The RISE Battery was administered via the Children Helping Science platform to 55 6-month-old infants and 56 12-month-old infants (49% female, 51% male; 8.3% were reported as Asian, 1.8% as Black, 52.3% as White, and 37.6% as more than one race) recruited from the general population via social media and the platform Registry. We used iCatcher+ to compute gaze direction. Primary analyses were linear mixed-effects models with child and stimulus crossed random effects. Models were fit separately for each age group. To date, we have enrolled 35 infant siblings of autistic children (6 mo, $n = 23$; 12 mo, $n = 12$) for whom coding and analysis is underway.

Results: Most tasks produced expected results in infants without an autistic sibling (Figure 2). In the social attention task, 6 and 12-month-old infants looked reliably more at a child dancing than an abstract geometric figure ($M = 0.62$ (.57 - .67), $p < 0.001$). In the memory task, infants showed preferential attention to novel faces and complex non-face stimuli following familiarization at both ages (Faces: $M = 0.56$ (0.53 - 0.59), $p < .001$; Fribbles: $M = 0.54$ (0.51 - 0.57), $p = .016$), suggesting that infants successfully encoded the familiarized images. In the word comprehension task, 12-month-olds, but not 6-month-olds oriented more to the target stimulus when it was the target than when it was the distracter (12-m: 0.05 (0.01 - 0.08), $p = 0.009$; 6-m: -0.02 (-0.06 - 0.02), $p = 0.267$). In the prediction task, 6- and 12-month-old infants showed anticipatory eye movements to a cued target location ($M = .70$ (0.62, 0.78), $p < .01$). Only the audiovisual synchrony task failed to produce the expected results of preference for synchronous relative to asynchronous stimuli ($p > .05$).

Conclusions: The RISE battery provides a remote and scalable method for assessing early cognitive and language skills in large samples of infants. Before INSAR, we anticipate completion of data collection for the infant siblings that will allow us to address group differences. We are also collecting parent report measures of infant development 6 months following enrollment. Results will be discussed in the context of the feasibility and validity of this remote assessment for digital phenotyping.

**Oral Session -****306 - Rare Genetic Models in Autism 1**

May 1st, 2025, 2:00 PM - 3:00 PM - 606-607

Moderator: Jacob Ellegood, Bloorview Research Institute, Holland Bloorview Kids Rehabilitation Hospital, Toronto, ON, Canada

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306.001 Dysregulation of Cortical Neurogenesis in Autism Pathogenesis: Leveraging the Autism-Associated 3q29 Deletion to Define Cellular and Molecular Mechanisms

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Background: Human neuropathological, neuroimaging, and gene enrichment studies consistently link altered neurogenesis, the process by which neural precursor cells (NPCs) proliferate, migrate, and differentiate, to neurodevelopmental disorder (NDD) pathogenesis. The 3q29 deletion confers high risk for autism: males with 3q29 deletion are 15 times more likely to have autism, while the risk rises to 36 times for females. Individuals with the 3q29 deletion who do not qualify for a diagnosis of autism exhibit substantial social disability, and the 3q29 deletion mouse model created by our team also displays changes in social behavior in male mice, indicating that the 3q29 deletion has a global impact on social functioning. Human 3q29 deletion study participants have reduced frontal occipital circumference, and 3q29 deletion mice show smaller head size and brain weight than littermate controls; new data indicate 9% reductions in postnatal day (P) 7 forebrain weight. Our previous single-cell analysis of the transcriptome in human cortical organoids revealed pronounced dysregulation of genes involved in neurogenesis (pathway p-value < 10⁻²³) in immature neurons. Taken together, these data warrant detailed characterization of cortical neurogenesis in 3q29 deletion syndrome.

Objectives: Determine the cellular and molecular mechanisms by which the NDD-risk CNV 3q29 deletion dysregulates cortical neurogenesis.

Methods: We performed structural, immunoblot, and immunohistochemical analysis of embryonic (E13.5-18.5) and postnatal (P0-P21) cortex in 3q29 deletion mouse compared to wild type controls (WT), defining NPC proliferation (VZ/SVZ), S-phase entry (Edu incorporation), apoptosis, and layer formation. Parallel cross-species comparisons using patient and isogenic 3q29 deletion derived cortical organoids from Day 7 to 90 are underway to define how 3q29 deletion impacts developmental neurogenesis.

Results: We identified hyperproliferation of E15.5 cortical NPCs including increases in height of VZ marker, Pax6 (15%), VZ/SVZ marker Ki67 (19%), and a 37% increase in S-phase entry (p<0.003; N=5-7/genotype, 3 litters) in 3q29 deletion cortex compared to WT littermates. Further, there was a 27% increase of endogenous mitotic cell marker, phospho-H3. In contrast, there were no differences at E13.5 nor E16.5. Given reduced forebrain weight at P7, we considered possible altered cell death: Indeed, at E16.5, there was a 64% increase in apoptosis marker, cleaved caspase-3 (N=5/genotype; 2 litters) localized to intermediate zone, suggesting hyperproliferation may be followed by premature termination of corticogenesis. In ongoing studies we are analyzing multiple embryonic ages, assessing cell cycle leaving fraction, and expression of laminar markers (Tbr2, Ctip2, Satb2, Cux1), with select studies at P0, P7, and P21. Preliminary human iPSC-derived organoids suggest increases in NPC proliferation and alterations in levels CTIP2 and SATB2.

Conclusions: Our studies of the autism-associated 3q29 deletion suggest a common neurobiological pathway for autism pathogenesis, specifically altered cortical neurogenesis. Indeed, other CNVs such as 16p11.2 and 22q11.2 as well as rare variants like CHD8, impact similar pathways, suggesting there are convergent mechanisms for autism pathogenesis. Preliminary studies suggest that human cortical organoids exhibit some common phenotypes. Future studies will analyze single cell lineage tracing to determine the genetic and molecular cascade that leads to dysregulated cortical development and may identify possible avenues for intervention.



306.002 Identifying Therapeutic Targets for PTEN-Related Neurodevelopmental Disorders

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Background: Autism Spectrum Disorder (ASD) and related neurodevelopmental disorders (NDDs) are influenced by complex genetic factors. *PTEN* (phosphatase and tensin homolog), a prominent ASD risk gene associated with macrocephaly, regulates the PI3K-Akt-mTOR pathway. Variants in *PTEN* contribute to NDDs by disrupting cellular processes crucial for brain development. Despite this, effective therapeutics supporting individuals with *PTEN*-associated NDDs remain limited, emphasizing the need to uncover new molecular pathways and develop targeted interventions.

Objectives: This study employs a candidate genetic modifier approach with two primary goals: 1) to better understand the molecular networks by which *PTEN* influences the development of brain and behavior, and 2) to develop novel therapeutic strategies that may improve the quality of life for individuals with *PTEN*-associated NDDs.

Methods: To identify candidate genetic modifiers, we analyzed genes with the highest spatiotemporal expression correlation with *Pten* in the developing brain, using the Allen Developing Mouse Brain Atlas. Utilizing a *Pten* haploinsufficient mouse model (*Pten*[cHet]) and conditional modification via *Emx1*-Cre, we assessed neuroanatomical features, such as cortical thickness and cellular volumetric changes, alongside behavioral assays for social interaction. Additionally, we are conducting *in silico* kinase activity profiling and biochemical assays to explore pathway-specific effects in the developing cerebral cortex of *Pten*-deficient mice.

Results: Our analysis identified *Csnk1a1* (Casein Kinase 1 Alpha 1, encoding CK1α) as a candidate modifier with high spatiotemporal co-expression with *Pten* during brain development. CK1α, a serine/threonine kinase, regulating Wnt signaling, and cellular proliferation and differentiation, plays an important role in cortical development. In *Pten*[cHet] mice, genetic suppression of CK1α via heterozygous mutation ameliorated cellular hypertrophy and restored social preference in adult animals, indicating its potential role in mitigating *Pten* loss-of-function phenotypes. Ongoing work is investigating the impact of CK1α on protein synthesis and cellular overgrowth in *Pten*-deficient models.

Conclusions: This study identifies CK1α as a potential target to modulate neurodevelopmental phenotypes in *PTEN*-associated NDDs. By elucidating the mechanisms underlying the genetic modifier effect of CK1α, we aim to enhance our understanding of the role of PTEN in neurodevelopment and open pathways for targeted therapeutic strategies to better support individuals with ASD-associated phenotypes.

306.003 Synaptic Density Marker, SV2A, Is Reduced in Autistic Adults and a Mouse Model of Idiopathic Autism

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Background: Altered synaptic number, structure and function are thought to be key neurobiological mechanisms underpinning many autistic features, as suggested by genetic (Bourgeron, 2015), post-mortem (Nicolini et al., 2015) and animal model (Tang et al., 2014) research. However, there is limited *in vivo* evidence about whether synaptic density is altered in autistic people.

Objectives: We conducted the first multi-site, translational study of synaptic density in autistic people and in 'idiopathic' and 'monogenic' mouse models of autism, using positron emission tomography (PET) and autoradiography, respectively. We hypothesised 1) that synaptic density would be altered in autistic compared to non-autistic adults in fronto-temporal regions (Hutsler & Zhang, 2010; Nakamura et al., 2011; Nicolini et al., 2015), the amygdala (Schumann & Amaral, 2006), the basal ganglia and the cerebellum (Wegiel et al., 2014), and 2) altered profiles of synaptic density differences (compared to wildtypes) in idiopathic versus monogenic mouse models.

Methods: Across three study sites, we included 30 autistic adults (22 males, aged 19–58), and 52 non-autistic controls (42 male) who did not differ on full-scale IQ. No participants had co-occurring physical or developmental conditions. *In vivo* synaptic density was estimated using the radioligand ¹¹C-UCB-J, which binds to the pre-synaptic protein SV2A. Our primary metric was the non-displaceable binding-potential (BP_{ND}) of ¹¹C-UCB-J, where centrum semiovale was used as reference region. Analyses were replicated using the distribution volume (V_t) of ¹¹C-UCB-J.

Autistic traits were quantified using the Social Responsiveness Scale-II.

We performed ³H-UCB-J autoradiography to quantify synaptic density in the BTBR T+tf/J idiopathic autism mouse model (with strong face validity, but unknown genetics), two monogenic mouse models with mutations in synaptic genes linked with autism in humans: *Nlgn3*^{R451C} knock-in and *Nrxn1a* knock-out mice, and wildtype controls specific to each model.

Results: Across hypothesised regions, ¹¹C-UCB-J BP_{ND} was significantly lower (by 5.8 %) in autistic compared to non-autistic people. In region-specific analyses, ¹¹C-UCB-J BP_{ND} was significantly lower in autistic people in the anterior cingulate cortex, the temporal cortex, the nucleus accumbens, amygdala and cerebellum. Greater autistic traits across groups correlated with lower ¹¹C-UCB-J BP_{ND} . Consistent results were obtained using ¹¹C-UCB-J V_t .

In the BTBR mouse model, ³H-UCB-J was lower in the sensory and auditory cortices, the striatum, hippocampus, amygdala, thalamus and hypothalamus, compared to C57Bl6/J wildtypes (Figure 1). In the *Nlgn3*^{R451C} knock-in model, ³H-UCB-J was decreased in the hypothalamus but increased in the amygdala compared to wildtype littermates. There were no significant differences in ³H-UCB-J between *Nrxn1a* knock-out mice and their wildtype controls.

Conclusions: We report findings from the largest *in vivo* study of synaptic density in autistic people. Converging evidence from autistic adults and the BTBR mouse model highlights a significant reduction in synaptic density in 'idiopathic' autism. Implicated brain regions are known to be associated with autistic behaviours. Further, we provide convergent biological validity for BTBR mice as an animal model for pre-synaptic density in idiopathic autism, enabling back-translation.

**306.004** Impact of Generalized Epilepsy on Autistic Phenotypes in SynGAP1-Related Disease

N. Omar¹ and J. P. Hegarty², (1)Stanford University, Palo Alto, CA, (2)Psychiatry and Behavioral Sciences, Stanford University School of Medicine, Palo Alto, CA

Background: Pathogenic variants in the gene *SYNGAP1* cause generalized epilepsy starting in early life (age 2-3) in >90% of affected individuals, and autism spectrum disorder (ASD) in 50% of affected individuals. Other disease co-morbidities include developmental delay/intellectual disability and disrupted sleep wake cycling. *SYNGAP1* is part of an N-methyl-D-aspartate receptor (NMDAR) complex in glutamatergic neurons that negatively regulates Ras GTPase through ERK/MAPK kinases, preventing excessive AMPA receptor insertion into the post-synaptic density. Haploinsufficiency of *SYNGAP1* is thought to result in increased AMPA insertion into the PSD, ultimately resulting in excessive neuronal excitability and seizures/epilepsy. However, the mechanism by which autism results from *SYNGAP1* haploinsufficiency is unclear. We hypothesized that the seizures themselves lead to maladaptive remodeling of brain networks that promotes the development of autistic phenotypes. **Objectives:** Our overarching goal is to determine whether seizures induce or increase autistic behaviors and other co-morbidities, such as cognitive deficits and sleep/wake cycling. In the present study, we examined the temporal association between seizures, autistic behaviors and comorbidities. **Methods:** *SynGAP*^{+/-} mice (*Syngap1* Het) and wildtype (*SynGAP*^{+/+}; WT) littermate controls were implanted for EEG recordings at P50. 24 hour video EEG was recorded with a Pinnacle system at P60, P90, P120, and P150. We quantified the number of seizures in 24 hours, REM/NREM durations, and total sleep time. Behavioral testing at P60 timepoint included: social interaction test, marble burying test, and Y maze. **Results:** In *SynGAP*^{+/-} mice, absence seizures begin at P60, (80 seizures/24 hours) and progressively increase until at P120, when they occur an average of 160 seizures/24 hours. At P60, social interaction performance is equivalent in WT and *SynGAP*^{+/-} mice. However, at P120, while WT mice continue to show social chamber preference over null chamber, *SynGAP*^{+/-} mice display impaired performance, with no preference for social/null zones or cups. *SynGAP*^{+/-} mice also demonstrate excessive marble burying, also consistent with autistic behavior. *SynGAP*^{+/-} mice likewise demonstrate decreased spontaneous alterations in the Y maze test, indicative of impaired spatial working memory. *SynGAP*^{+/-} mice spent more time awake in the dark and in the light across the 24hrs, with decreased NREM duration in the dark. **Conclusions:** We found a temporal association between seizures, autistic behaviors and cognitive impairment and sleep disruption in *SynGAP*^{+/-} mice. These findings validate *SynGAP*^{+/-} mice as models that recapitulate the full spectrum of *SYNGAP1*-related disease in humans. Statistical correlation of these deficits with seizure burden is underway. To directly test the influence of seizures on autistic behaviors and other disease comorbidities, we are pharmacologically blocking seizures with the drug ethosuximide in *SynGAP*^{+/-} mice. We will determine whether seizure blockade normalizes social interaction, cognition and sleep-wake cycling. *This investigation is ongoing and analyses will be completed with updated data.

Oral Session -

307 - At Risk/Screening

May 1st, 2025, 2:00 PM - 3:00 PM - 4C-1,2

Moderator: Stephen M. Kanne, Center for Autism and the Developing Brain, Weill Cornell Medicine, White Plains, NY

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307.001 Comparison of Laboratory-Based Versus Remotely Administered Assessments for Infants at Elevated Likelihood for Neurodevelopmental Disorders

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Background: Although there has been an exponential increase in the use of remote assessments for studies of infant and toddler development in the last several years, few studies have reported on direct comparisons between remote and existing standardized, laboratory-based tasks. The existing validation studies have primarily focused on diagnostic assessment tools for toddlers. There are no remote observational developmental assessments for infants that have been compared to existing gold-standard measures.

Objectives: To systematically compare existing gold-standard laboratory-based measures of infant and toddler development used widely in autism research to a remote assessment protocol intended to measure the same constructs.

Methods: We recruited participants from an ongoing longitudinal laboratory-based study of infants with a family history of autism, ADHD, or neither. We enrolled 112 infants and completed telehealth visits at one or more target ages: 6 or 9, 12, or 18 months. Telehealth visits were completed following a manualized protocol, the Telehealth Evaluation of Development for Infants (TEDi) by examiners naïve to family history group and to laboratory assessment. Laboratory-based examiner-administered measures include the AOSI/ADOS (Bryson et al., 2008; Lord et al., 2012) and MSEL (Mullen, 1995). Behavioral observation from parent-coached activities in TEDi sessions were used to score AOSI ratings and the ESDM Infant-Toddler Curriculum Checklist (Rogers et al., 2020). Both sessions included coding of ADHD-related behaviors, parent-reported representativeness, and examiner concerns.

Results: We completed total of 249 telehealth visits: 81 at 6 or 9 months, 84 at 12 and 84 at 18 months. Visits took place, on average, 8 days following the in-person assessment ($M = 8$ days, $SD = 4.7$; range 1 – 41 days). Overall, we found some small but statistically significant differences in mean scores across the two contexts for measures using the same rating systems (Table 1). Within-construct correlations were moderate-to-strong for all domains except parent-rated representativeness (Table 2). The language and cognitive domains showed the strongest association, ranging from 0.72 to 0.82.

Conclusions: Overall, these findings support the use of telehealth-based assessments to expand the reach of studies on early developmental trajectories of infants with elevated likelihood for neurodevelopmental disorders. Findings related to group- and age-specific patterns will also be discussed.



307.002 Birth Cohort Assessment of Access, Equity, and Accuracy of Universal Autism Screening within a Large, Diverse, Health System

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Background: Universal autism screening in pediatric primary care with the Modified Checklist for Autism in Toddlers with Follow-up (M-CHAT/F) at the 18-and-24-month well-child-visit (WCV) is promoted by the American Academy of Pediatrics (AAP) to reduce age of first diagnosis. However, implementation of universal screening in two large pediatric networks that use the M-CHAT/F demonstrated lower overall screening accuracy than previously observed (sensitivity:33.1, 38.8; positive predictive value [PPV]:17.8, 14.6), with significant disparities in screening rates and accuracy among marginalized children. Conclusions from these studies emphasize possible limitations of the M-CHAT/F's validity in community samples. However, findings from these studies also point to modifiable patient, clinic, system, and policy factors that could impact observed sensitivity and PPV.

Objectives: We examined universal screening access, accuracy, and equity of the M-CHAT-R within a large, diverse, health-system serving Metro Detroit, Michigan across birth cohorts that experienced variations of patient, clinic, system, and policy factors that could impact receipt of diagnosis (e.g., electronic screening/scoring, referral practices, access to/completion of diagnostic assessment). For each birth cohort, we examined: 1) screening and referral rates of all patients; 2) screening and referral rates across demographics; 3) sensitivity and positive predictive value of the M-CHAT-R.

Methods: Data were extracted from electronic health records of over 30,000 pediatric patients who were born between 2013 and 2019, and visited primary care clinics for a WCV, between 2013 and 2023. To align with both AAP screening guidelines, and M-CHAT-R screening window, screening age range was restricted to 15 to 30 months. ASD diagnoses were identified using ICD-9 codes (299.XX) and ICD-10 codes (F84.XX).

Results: We found that: 1) screened once rates of birth cohorts ranged from 43%-to-86%. Later cohorts were significantly more likely to be screened twice, coinciding with changes to screening administration ($p<.05$). Referral rates ranged from 45%-to-53% across cohorts; 2) Overall, patients who were white, living in neighborhoods with lower education, or insured by Medicaid were significantly less likely to be screened. Additionally, patients who were white or from higher-income neighborhoods demonstrated the largest increases in screening rates; 3) When considering the whole sample, the sensitivity of the M-CHAT-R was 36.8% and the positive predictive value (PPV) was 34.7%. However, across birth cohorts sensitivity ranged from 18%-to-63%, while PPV ranged from 25%-to-47%.

Conclusions: Across cohorts, universal screening rates and referral rates increased and some identified disparities in screening access decreased. Some of these increases were linked to implementation changes (e.g., electronic administration/scoring). Additionally, Michigan's autism insurance mandate went into effect the year before our first cohort (2012) and may have increased access to diagnostic evaluations. Thus, the increases seen in universal screening rates, referral rates, and likely increased access to diagnostic visits may have contributed to an increased likelihood of identifying "true positives" within our health system – resulting in the general increase of sensitivity and PPV values across birth cohorts. More research is necessary. However, this study demonstrates that sensitivity and PPV of the M-CHAT-R within health systems is not static and that implementation factors may impact these values.

307.003 Sense to Know, a Digital Phenotyping Mobile App for Assessment of Autism-Related Behaviors in Children from 1.5 to 8.5 Years of Age

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Background:

There is a critical need for scalable, quantitative, and objective tools for autism screening and outcome monitoring to complement clinician and caregiver-report measures. To address this, we developed SenseToKnow, a tablet- or smartphone-based mobile digital phenotyping app, which uses computer vision and machine learning to automatically measure autism-related behaviors, including gaze, attention, facial and head movements, blink rates, and motor skills. SenseToKnow can detect autism in 18–36-month-old toddlers with high diagnostic accuracy when delivered in primary care (Perochon et al., 2023) or remotely by caregivers (Krishnappa Babu et al., 2024). In toddlers, digital phenotypes correlate with standardized clinical measures (Coffman et al., 2023). Here, we present a study that examined (1) whether the SenseToKnow app can detect autism-related behaviors in preschool- and school-age children and (2) correlations between the digital phenotypes and a caregiver-report behavioral measure.

Objectives:

Determine whether the SenseToKnow app can detect autism-related behaviors in preschool- and school-age children and examine correlations between individual digital phenotypes and a caregiver-report behavioral measure.

Methods:

149 children (107 boys, 42 girls), aged 40.2–102.6 months, participated. 45 were neurotypical; 104 were diagnosed with autism spectrum disorder based on the Autism Diagnostic Observation Schedule-2 or the Brief Observation of Symptoms of Autism. Standardized measures of cognitive abilities and the Vineland Adaptive Behavior Scales-3 were administered.

SenseToKnow was delivered on an iPad. The tablet's front camera recorded children's responses to brief movies and touch data were gathered during a game. Computer vision and touch data quantified gaze, head/facial movements/complexity, attention (facing forward), blink rates (lower = higher attentional engagement), and motor skills.

Results:

Based on Mann-Whitney U tests, we found autistic children spent significantly less time gazing at social stimuli and showed less focused patterns of gaze compared to neurotypical children. Autistic children showed significantly lower correlations between their gaze and actors' speech. Autistic children displayed significantly more frequent head movements and lower complexity of their eyebrow and mouth movements and higher blink rates. Results remained significant using age and sex as covariates. Group differences in gaze (e.g., social attention) and head movement complexity remained after controlling for developmental quotient.

For autistic children, all VABS-3 subscales were significantly correlated with app features, including gaze, facial/head movements, overall attention, blink rates, and motor skills (Table 1).

Conclusions:

Combined with earlier work with toddlers, these findings indicate that SenseToKnow, a brief digital phenotyping app, can automatically detect and quantify several autism-related behaviors in children ranging from toddlerhood to school age. In the present sample, we found that the digital phenotypes correlate with several aspects of children's behavior as assessed by the Vineland Adaptive Behavior Scales. Autistic children with higher VABS communication, daily living, socialization, and motor skills exhibited higher levels of social attention and coordinated gaze with speech, less frequent head movements, higher complexity of facial movements, higher overall attention, lower blink rates (attentional engagement), and higher visual motor skills. These findings suggest that SenseToKnow can detect and quantify autistic behaviors in children across a wide age range, with potential usefulness for outcome monitoring.



307.004 Preliminary Psychometrics of the M-CHAT-S, a Novel Screening Tool for Identifying School-Age Children with Possible Autism

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Background:

Although autism can be diagnosed in many children as early as two years old, age of first diagnosis is still 4 years in the US. Efforts to lower this age have focused on improving screening tools and practices to identify children in need of assessment. One widely used tool, the Modified Checklist for Autism in Toddlers, Revised with Follow-up (M-CHAT-R/F), is recommended as part of universal autism screening at 18- and 24-month well-child pediatric visits. However, universal autism screening in toddlers is limited by inequality in access to pediatric preventive care and differences in implementation of screening across clinicians. To address these issues, we developed the Modified Checklist for Autism in Toddlers – School (M-CHAT-S) to screen young school-age children, following PROMIS guidelines for measure development, including an extensive literature review of existing measures and cognitive interviews with end users. This study resulted in two versions of the M-CHAT-S, for verbally fluent and minimally verbal children (Wieckowski et al., 2024). The current pilot study presents data on this new tool.

Objectives:

The objective of this study was to test the psychometric properties of both versions of the M-CHAT-S, for caregiver and educator informants.

Methods:

Participants ($n=276$; Table 1) completed one version of the M-CHAT-S on Qualtrics. Participants were either caregivers or educators of children ages 4-8 years old. There were no exclusions based on child diagnosis; thus, children in this sample had autism diagnoses, but also global developmental delay, ADHD, and others. In addition to the M-CHAT-S, participants completed the Social Responsiveness Scale, 2 (SRS-2) for convergent validity and the Child Behavior Checklist (CBCL) for discriminant validity.

Results:

Cronbach's alpha ranged from .78 to .92 across the two versions of the M-CHAT-S and two informant types, demonstrating acceptable to excellent internal consistency (Table 1). Convergent validity was demonstrated by moderately strong to strong correlations with the SRS-2, with weaker correlations demonstrated with both the internalizing and externalizing scales of CBCL, demonstrating discriminant validity.

As a preliminary test of predictive validity, we compared M-CHAT-S total scores for children with and without a diagnosis or educational classification of autism. In both versions, and with both informant types, M-CHAT-S score was lower in the non-autistic sample (Table 2); however, this difference was statistically significant only for the verbally fluent version ($p<.001$, $d=1.05$ for caregivers; $p=.028$, $d=0.61$, for educators).

Conclusions:

The M-CHAT-S shows promise as an easy-to-implement tool that may help identify children who would benefit from an autism diagnostic assessment. The results of this study suggest that the M-CHAT-S better discriminates autistic and non-autistic children who are verbally fluent, compared to those who are minimally verbal; however, this could be an artifact of the relatively low rate of minimally verbal non-autistic children in this sample. Future research is needed to determine if the M-CHAT-S can detect autistic school-age children who were not previously identified, thereby helping lower the age of autism diagnosis and access to services.

**Oral Session -****308 - Support Well-Being During Transition and Adulthood**

May 1st, 2025, 3:00 PM - 4:00 PM - 6B

Moderator: Yi-Ling Chien, *National Taiwan University Hospital, Taipei, Taiwan*

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308.003 The Impact of Group-Based DBT Skills Training on Emotion Dysregulation and Coping Skills Use for Autistic Adults

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Background: Autistic adults without intellectual disability experience higher rates of co-occurring mental health problems and increased emotion dysregulation compared to non-autistic peers, yet research examining effectiveness of interventions for autistic adults is limited. Dialectical behavior therapy (DBT) is designed to improve emotion dysregulation, suicidality, and co-occurring mental health by building skills across four areas: mindfulness, distress tolerance, emotion regulation, and interpersonal effectiveness. Though the evidence is growing, more studies are needed to determine whether participation in a DBT group is associated with improved mental health outcomes in autistic individuals.

Objectives: We examined whether participation in group-based DBT skills training (DBT-ST) led to significant changes in skills use, dysfunctional coping, and emotion dysregulation for 18 autistic adults.

Methods: 18 autistic adults (aged 18-67 years; *M* age: 31.72; 56% male; 80% White; no intellectual disability) completed an adapted DBT-ST group within several community-based autism clinics. Groups meet weekly for 1.5 hours over 24 weeks and were initially held in person, although groups transitioned online following the pandemic. Groups included about five autistic adults, two group leaders from outpatient autism clinics, and a trainee. Only data from group members who consented to participate in research were included. Participants completed the Difficulties in Emotion Regulation Scale (DERS) and DBT Ways of Coping Checklist (WCCL) pre- and post-group.

Results: At the group level, paired samples t-tests showed significant reductions in emotion dysregulation ($t = 4.33, p < .001$) and dysfunctional coping ($t = 3.30, p = .005$) and significant increase in skills use ($t = -4.19, p < .001$). At the individual level, reliable change indices were calculated by dividing the difference of baseline and endpoint scores by the standard difference, which accounted for test-retest reliability of the measures. Considering the DERS, nine of the 18 participants experienced a statistically significant reduction in emotion dysregulation, six experienced a non-significant reduction, and three experienced no change or non-significant increases. Considering skills use on the WCCL, seven of the 17 participants significantly increased their skills use, seven experienced a non-significant increase in skills use, and three experienced no change or non-significant decreases. Five participants had significantly decreased dysfunctional coping, eight had non-significant decreases, and four had no change or non-significant increases. No participants had significant worsening on any measures. See Figure 1.

Conclusions: This open trial utilizes a community-based implementation framework to examine the efficacy of DBT-ST groups. Initial data suggest that group-based DBT-ST may be effective in reducing emotion dysregulation and maladaptive coping and increasing healthy coping for autistic adults. It is important to note that these data are based on participation in a 24-week DBT-ST group and not a comprehensive DBT program (i.e., no individual therapy required; no coaching calls). Future research should examine factors that impact DBT-ST efficacy for certain autistic adults and how DBT-ST may lead to downstream effects on mental health (i.e., anxiety or depression) and positive outcomes (e.g., flourishing, life satisfaction).



308.004 Diverse, an Innovative Curriculum for Supporting Autistic Individuals in the Workplace Developed By the Neurodiverse Community: A Pilot Efficacy-Implementation Trial

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Background:

Autistic individuals face challenges in securing and maintaining competitive employment. Our team co-developed a training curriculum titled DIVERSE (Developing Inclusive Vocational Education and Resources for Success in Employment) with multiple stakeholders using community-based participatory research (CBPR) for job coaches (JCs), employers, family members (FMs) in providing effective, strengths-based support. The DIVERSE curriculum adapts an existing curriculum and utilizes user-centered design methods. We incorporated diverse perspectives from community stakeholders (including JCs, educators, employers, FMs, autistic individuals, and adults with other intellectual and developmental disabilities (I/DD)) in the development of DIVERSE.

Objectives:

This study has two objectives: (1) assess the efficacy of DIVERSE for JCs, employers, and FMs in increasing their competency in working with autistic individuals and individuals with I/DD; (2) determine the barriers and facilitators to improve the feasibility and dissemination of the curriculum in the neurodiverse community.

Methods:

DIVERSE consists of seven core modules, each comprised of captioned videos, handouts, and quizzes on an online learning management platform. The modules were developed. Each video was ~15-20 minutes long.

Efficacy Trial: A pilot prospective cohort study of DIVERSE was conducted with JCs (n=44), FMs (n=22), and employers (n=12), testing changes in knowledge, self-confidence, and self-efficacy in working with people with I/DD. Before starting the DIVERSE curriculum and after the six-week period or completion, participants completed a battery of surveys (a DIVERSE knowledge quiz and a questionnaire measuring attitudes, norms, and self-efficacy). Pair sample t-tests were used to assess the change before and after the delivery of DIVERSE.

Implementation Trial: We utilized a mixed methods design to understand barriers and facilitators to the implementation of DIVERSE and whether these factors differed by group membership. 78 JCs, parents, and employers completed the DIVERSE training and at least one quantitative survey (Acceptability of Intervention Measure (AIM), Intervention Appropriateness Measure (IAM), and Feasibility of Intervention Measure (FIM)). A subset of 25 individuals completed semi-structured interviews. Interview questions and analysis were based on the Consolidated Framework for Implementation Research.

Results:

Eighty-one participants (94%) completed all seven modules of the DIVERSE curriculum within six weeks. Seventy-eight (91%) responded to at least one post-training survey. DIVERSE was shown to increase objective knowledge ($p=.00002$; $d=-.52$) and subjective knowledge about autism ($p=.00386$; $d=-.46$) in quizzes and self-rated questionnaires, respectively. Furthermore, JCs who completed DIVERSE demonstrated increased self-efficacy ($p=.00098$ and $d=-.54$) and self-confidence ($p=.00121$ and $d=-.54$) in coaching autistic clients and clients with autism.

DIVERSE was found to have high acceptability, feasibility, and appropriateness levels, as indicated by quantitative measures. There were no differences by participant type or demographic group. Major facilitators included the belief that DIVERSE is helpful and easy to complete, its fulfillment of a need in the community, and its compatibility with personal or organizational values. Major barriers included the applicability of curriculum content and the need for specific topics.

Conclusions:

The study demonstrated a preliminary signal for DIVERSE's efficacy in JCs, FMs, and employers. DIVERSE is feasible, acceptable, and appropriate training for supporters of neurodivergent employees that fit the needs of various stakeholders.

Oral Session -**309 - Sociability Among Autistic Children and Adults**

May 1st, 2025, 3:00 PM - 4:00 PM - 6C

Moderator: Wing Chee So, *Educational Psychology, The Chinese University of Hong Kong, Hong Kong, NA, Hong Kong (China)*

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309.001 Examining Individual Differences in Sociability Among Children with Autism Using the Child Social Preference Scale

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Background: Research indicates that, at the group level, individuals on the autism spectrum exhibit lower levels of trait sociability compared to the neurotypical population; however, significant individual variability exists *between* individuals on the autism spectrum. The approach-avoidance motivation framework, which examines how individuals balance motivations to approach or avoid social interactions, offers valuable insights into these diverse tendencies. Studies suggest distinct forms of (un)sociability: (1) shyness, involving reluctance due to discomfort; (2) unsociability, characterized by indifference and a preference for solitude; and (3) social avoidance, where solitude is coupled with active avoidance of social contact. However, the lack of assessment tools capable of accurately distinguishing between these forms in autism limits efforts to characterize individual differences and understand their clinical implications. The Child Social Preference Scale (CSPS), validated across diverse child populations and adapted for adolescents and young adults, provides a framework to delineate these unsociability types, yet its psychometric properties in autism require further exploration.

Objectives: Assess the factor structure of the CSPS among children on the autism spectrum, establish its psychometric properties, and explore the associations between various forms of unsociability and other key individual differences.

Methods: Parents of 689 children diagnosed with autism, aged 5-to-17 years ($M [SD]=11.23 [3.56]$; 76% male), completed the CSPS. Confirmatory application of exploratory structural equation modeling was employed to test the original three-factor structure of the CSPS, including correlated factors and bi-factor models. Model fit was evaluated using comparative fit index (CFI), Tucker–Lewis index (TLI), root mean square error of approximation (RMSEA), and its 95% confidence interval. The stability of the final factor solution was examined across sex and age. Reliability was assessed using Cronbach’s alpha and McDonald’s omega coefficients. T-tests analyzed sex differences in CSPS subscales, while Spearman’s rho correlations explored relationships with age and various individual difference factors: attachment and affiliation (Social Responsiveness Scale-2nd Edition [SRS-2]), and conduct, emotion, and peer problems (Strengths and Difficulties Questionnaire [SDQ]).

Results: The bifactor model demonstrated superior fit ($CFI=0.973$, $TLI=0.944$, $RMSEA=0.108$ [90% CI: 0.099, 0.117], $SRMR=0.024$) compared to the correlated factors model ($CFI=0.955$, $TLI=0.922$, $RMSEA=0.126$ [90% CI: 0.118, 0.134], $SRMR=0.038$). All CSPS items exhibited strong and significant loadings on their intended factors and minimal loadings on non-hypothesized factors (**Figure 1**). High reliability and internal consistency were observed across factors: shyness ($\omega=0.730$, $\alpha=0.760$), unsociability ($\omega=0.837$, $\alpha=0.848$), and social avoidance ($\omega=0.845$, $\alpha=0.842$). There were no sex differences for shyness ($t(667)=0.446$, $p=.656$), unsociability ($t(667)=1.371$, $p=.171$), or social avoidance ($t(667)=1.397$, $p=.163$). Age exhibited weak positive correlations with shyness ($r=0.092$, $p<.05$), unsociability ($r=0.163$, $p<.001$), and social avoidance ($r=0.151$, $p<.001$). CSPS subscale scores positively correlated strongly with SRS-2 attachment and affiliation, and weakly with SDQ peer problems. Only unsociability significantly correlated with conduct problems, while shyness and social avoidance (but not unsociability) correlated with emotional problems (**Figure 2**).

Conclusions: These findings support the CSPS factor structure in children on the autism spectrum and underscore the heterogeneity in sociability within this population. Utilizing the CSPS could enhance understanding of individual differences in autism and inform the personalization of therapeutic supports.



309.002 Camouflaging and Impression Management: Using Structural Equation Modeling to Chart Shared Dimensions and Relations to Motivations, Cognitive Skills, and Mental Health

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Background: Some autistic individuals “camouflage” by hiding their autistic traits to appear socially neurotypical. They do so to secure friendships, find employment, and navigate hostile environments, likely at psychological costs. Recent evidence suggests the continuity of camouflaging across autistic and non-autistic people in the general population, involving similar strategies, motivations, and mental health consequences. Hence, camouflaging may be a form of general impression management (IM). However, no study has empirically assessed camouflaging in conjunction with established IM constructs. It remains unclear whether camouflaging and IM constructs share underlying dimensions, and whether these dimensions are uniquely associated with social pressure, cognitive traits, and mental health.

Objectives: First, we identified the joint dimensional structure underlying validated measures of camouflaging and established IM constructs. Second, we charted the relationships among the identified overarching IM dimensions with motivational, cognitive, and mental health factors, and examined whether these relations were moderated by neurodivergent traits.

Methods: The sample included 972 adults from a representative US general population sample (461 cisgender men, 491 cisgender women, 20 gender-diverse, $M_{age}=44.2$ yrs, 72.7% Caucasian, 7.51% neurodivergent). Participants completed an online survey with measures for impression management (camouflaging, compensation, self-presentation, self-concealment, and self-monitoring), social pressure (internalized stigma, belonging needs, social anxiety), cognitive skills (executive functioning, perspective taking), mental health (anxiety, depression, fatigue, authenticity), and autistic and ADHD traits. We used exploratory factor analysis (EFA) on 50% of the sample to elucidate the latent dimensions underlying camouflaging and IM measures. Then, we used structural equation modeling (SEM) to comprehensively map the relations between these IM dimensions and their predictors and outcomes across motivational, cognitive, and mental health domains.

Results: The EFA and subsequent item review showed that camouflaging, compensation, self-presentation, and self-concealment measures converge into an “intention” dimension, reflecting one's subjective intent or frequency of engaging in IM. Self-monitoring loaded onto another “ability” dimension, capturing one's subjective competence in executing IM. The SEM results (**Table 1 & Figure 1**) showed that IM intention was driven by social pressure and predicted by greater perspective-taking but lower executive functioning. On the other hand, IM ability was unrelated to social pressure but positively linked with both perspective-taking and executive functioning. IM intention was a significant mediator; it linked internalized stigma and interpersonal needs with poorer mental health. Elevated autistic and ADHD traits intensified the relationship between IM intention and more severe clinical outcomes, including increased fatigue, anxiety and depression symptoms, and inauthenticity. IM ability, however, was positively linked to better mental health.

Conclusions: These novel findings demonstrate the convergence between camouflaging and IM. Camouflaging shares conceptual common grounds with established IM constructs, but this overarching IM phenomenon is multi-faceted. “Intention” and “ability” emerged as two distinct IM facets, each differently associated with motivational, cognitive, and mental health variables. Importantly, IM partly manifests in neurodivergence-dependent ways; individuals with elevated autistic or ADHD traits and stronger IM intent face higher risks of negative psychological experiences. These insights guide future research unpacking the implications of IM intent versus ability and unique IM features across social and neurodiverse groups.



309.003 Stability & Discrepancy : Exploring Autistic Youth and Parent Report of Social Behaviors in Two Clinical Trials

H. M. Mattern^a and **S. Scherf^b**, (1)Developmental Psychology, Penn State University, University Park, PA, (2)Pennsylvania State University, University Park, PA

Background:

The Social Skills Improvement System (SSIS) measures social emotional competencies in youth (ages 3-18 years) by multiple raters (parents, teachers, youth). It is recommended as an outcome measure to assess social communication behaviors in autism (Anagnostou et al., 2015). Although the SSIS has good test-retest and inter-rater reliability between parent- and teacher- reports, informant discrepancies emerge when youth reports are evaluated (Gresham et al., 2017). This is not uncommon; there is emerging literature about these kinds of informant discrepancies, which may reflect unique contributions of each reporter on the youth's experience (De Los Royes & Epkins, 2023). For example, among autistic youth, self-reported behaviors are generally reliable and even exhibit associations with behavioral and physiological measures that are not evident with parent-report (Bakhtiari et al., 2021). As a result, there are increasing calls to "add the missing voice" of autistic youth in evaluating behavior and behavioral change (Kenworthy et al., 2021).

Objectives:

Our goals were to evaluate 1) the stability of *autistic youth's* self-report ratings on the SSIS over time and 2) potential informant discrepancies between parents and youth in two randomized clinical trials evaluating the effectiveness of a psychosocial intervention, Social Games for Autistic Adolescents (SAGA)(Scherf et al., 2018).

Methods:

In SAGA1, 40 autistic adolescents were randomized to either the intervention or treatment as usual condition. In SAGA2, 41 autistic adolescents were randomized to either the intervention or a placebo control condition. Youth participants and their parent each completed the SSIS at the pre- and post-intervention testing sessions. Total scores for social skills and problem behaviors were computed for each rater at each time point. We computed the test-retest reliability for the youth and parents separately for each condition (intervention, control) in each RCT (SAGA1, SAGA2). Finally, we assessed inter-rater agreement between youth and parent responses using the pre-test scores in each RCT separately.

Results:

Autistic youth in both studies and conditions provided stable reports of their social skills and problem behaviors with moderate to good reliability (Table 1). Similarly, parents generally provided stable reports of their adolescent's behavior with moderate reliability. In contrast, there was poor inter-rater reliability between the parent- and youth-reports of behavior at the pre-test session for social skills (SAGA1 $ICC = 0.16$, SAGA2 $ICC = 0.23$) and problem behaviors (SAGA1 $ICC = 0.23$, SAGA2 $ICC = -0.10$). Youth specifically reported higher social skills (SAGA1 $M=104(SD=16)$, SAGA2 $M=89(SD=18)$) than parents did (SAGA1 $M = 79(SD=14)$, SAGA2 $M = 80(9)$) and lower problem behaviors (SAGA1 $M = 99(SD=12)$, SAGA2 $M = 106(SD=13)$) than parents (SAGA1 $M=119(SD=12)$, SAGA2 $M=121(SD=10)$).

Conclusions:

The observed stability of autistic youth self-reports across studies and SSIS subsections suggests that youth report their own social skills and problem behaviors consistently over time. Furthermore, the striking differences between youth and parent report emphasize the need for researchers to evaluate when and how autistic self-reports should be included in research. Autistic self-report may provide a unique insight into the autistic experience and may contribute to more complete interpretations of research and study results.



309.004 Continuous, Objective Measures of Social Contact in Inclusive Preschool Classrooms Distinguish Children with and without Autism

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Background: Young children with autism spectrum disorder (ASD) show characteristic deficits in social communication. Recent longitudinal studies and clinical trials show that measures of ASD social engagement capture an important mechanism in children's social communication development and mediate treatment effects on social communication. Preschool classrooms and other natural environments where interactions occur with peers provide a unique context for development. Efforts to increase access to and participation in preschool settings for children with ASD have been hampered by a lack of scalable methods for measuring children's social engagement.

Objectives: This research employs modern location tracking technology to measure social contact by capturing second-by-second tracking of children's and teachers' interpersonal distance in inclusion preschool classrooms. Computational methods from statistical physics were used to derive continuous, objective measures of social contact (a) with peers only (%*peer*) and (b) with both peers and teachers simultaneously (%*peer&teacher*).

Methods: Data were collected across two school years in three age-grouped classrooms of a university-affiliated inclusion preschool focused on autism (i.e., classrooms for 2-, 3-, and 4-year-olds). The sample included $N = 61$ children, including 24 children with ASD; $n = 16$ children attended the program across two school years (**Table 1**). During each school year, objective measures were collected on 3-4 consecutive days during fall, winter, and spring. On each day, data were collected during two free-play periods, in the classroom and on the playground. In total, we collected 519 and 454 location tracking measures in the classroom and on the playground, respectively.

Results: Repeated objective measures of %*peer* and %*peer&teacher* were evaluated as outcome using general linear mixed effects regression models (**Table 2**). Across both diagnostic groups, results from fixed effects analyses revealed that %*peer* was significantly higher on the playground, 48.8% (46.2%, 51.4%), compared to the classroom, 43.6% (41.0%, 46.1%), $p < .001$. Moreover, classroom measures of %*peer* were significantly lower for children with ASD, 40.1% (36.3%, 44.0%), compared to children without ASD 45.7% (42.7%, 48.7%), $p < .01$. Similarly, playground measures of %*peer* were significantly lower for children with ASD, 42.2% (38.3%, 46.2%), compared to children without ASD 53.0% (49.9%, 56.0%), $p < .001$. Importantly, results showed a significant setting*diagnosis interaction effect, suggesting that diagnostic differences in %*peer* were larger on the playground, compared to the classroom, $p < .05$. Finally, while results for %*peer&teacher* showed significant differences by setting (classroom: 48.7% [47.3%, 50.1%], playground: 15.8% [14.4%, 17.2%], $p < .001$), diagnostic group differences were not statistically significant (ASD: 32.1% [29.1%, 35.1%], TD: 33.2% [30.9%, 35.5%], *ns*).

Conclusions: Results from this research contribute to our understanding of the construct validity of objective measures of social contact in inclusive preschool classrooms, providing developmental and intervention researchers with an innovative tool for studying the social development of children with ASD in naturalistic contexts. Further, results show that diagnostic differences in social contact with peers were no longer significant when teachers were simultaneously involved, suggesting that trained teachers may play an important role in facilitating the social engagement of children with ASD in inclusive preschool classrooms.



Oral Session -

310 - Anxiety: The Spectrum of Impacts Across Age, Sex and Cognitive Functioning

May 1st, 2025, 3:00 PM - 4:00 PM - 6A

Moderator: Matthew Siegel, *Boston Childrens Hospital, Boston, MA*

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310.001 Diagnostic Overshadowing? Autistic Children Are Less Likely to Carry an Anxiety or Depression Diagnostic Code When Prescribed SSRIs

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Background: Anxiety and depression co-occur frequently with autism, and are high-priority foci for the autism community. Selective Serotonin Reuptake Inhibitors (SSRIs) are increasingly prescribed in autism, despite relatively little data on their efficacy vis-à-vis core autism characteristics as well as co-occurring depression and anxiety symptoms. There are very few studies to date examining the extent to which SSRI prescriptions in autism are typically accompanied by diagnostic codes representing the primary conditions for which they have FDA-approved indications (depression and anxiety disorders). The present study examines this in a large Electronic Medical Health Record (EHR) database from a primary care setting.

Objectives: To examine rates of co-occurring anxiety and depression EHR diagnostic codes among autistic children being treated with SSRIs.

Methods: Approximately 10 million primary care patient encounters were examined among 365,341 unique individuals seen at the Children's Hospital of Philadelphia. 10,486 of these patients had an autism spectrum code noted at least once in their EHR.

Results: See Fig. 1 for an illustration of the proportion of patients with autism, anxiety, and/or depression codes in the EHR. Among the 354,855 total patients without an autism diagnostic code in their record, 9,152 (3%) have ever been prescribed an SSRI at some point over the course of their care. As expected, anxiety and depression codes were common in this group (7,607 patients, 83% of the total non-autistic patients taking SSRIs). Among the 10,486 patients with an autism diagnostic code in their record, 1,207 patients (12%) had ever been prescribed an SSRI over the course of their care (see Table 1). However, only 867 (72%) of these patients on SSRIs have an anxiety or depression code among any of their patient encounters – significantly fewer than the non-autism patients (Chi-Squared=90.5, $p<.001$).

Conclusions: The present findings of decreased anxiety and depression diagnostic codes among autistic individuals undergoing SSRI treatment have at least two salient interpretations. First, it is possible that SSRIs are frequently prescribed in autism to treat symptoms that do not fit squarely within depression/anxiety symptom categories, and may be more related to autism characteristics (in particular, repetitive behaviors and behavioral inflexibility). Second, decreased anxiety/depression diagnostic codes may reflect diagnostic overshadowing – the tendency to attribute most or all symptoms presented by an autistic person as part of their autism rather than another condition. The present study shares several limitations with all studies relying on EHR datasets – in particular, that diagnostic codes may not be fully equated with bona fide psychiatric diagnoses, and evidence of psychiatric concerns may be manifest in other parts of an EHR clinical encounter (besides diagnostic codes). It is nevertheless striking that the use of a depression or anxiety diagnostic code is so much less frequent among autistic children undergoing a mainstream treatment for these two common co-occurring conditions. Future research will benefit from a more in-depth examination of SSRI prescription practices in primary care, and the specific symptoms they are typically prescribed to treat among autistic individuals.



310.002 A Transdiagnostic Approach to Autism, Anxiety, and Social Adaptation in Adolescent Girls and Boys

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Background: Strategies utilized by the autistic community to conceal or compensate for neurodivergent traits are sometimes referred to as camouflaging or masking (Hull et al., 2018) and are a form of social adaptation. The Camouflaging Autistic Traits Questionnaire (CAT-Q) measures social adaptation across three dimensions: compensation (making up for social difficulties), assimilation (blending in with others in social situations), and masking (hiding autistic characteristics; Hull et al., 2018). Autistic girls report engaging in more social adaptation than autistic boys (Wood-Downie et al., 2021), and anxiety is more frequently diagnosed in adolescent girls than boys (Parodi et al., 2021); however, little is known about how anxiety, autism, and social adaptation interact and whether sex differences in adaptation exist in anxious teens as well as autistic teens. Anxiety, autism, and camouflaging are all considered risk factors for poorer long-term outcomes (Essau et al., 2014; Bernardin et al., 2021), and it is therefore important to explore how social adaptation unfolds in the context of autistic and anxious youth.

Objectives: In the current study, we use a transdiagnostic approach to examine: (a) whether self-reported social adaptation differs for autistic (AUT) vs. anxious (ANX) vs. neurotypical (NT) youth, (b) whether self-reported social adaptation differs in girls vs. boys, and (c) whether measures of anxiety associate dimensionally with social adaptation across diagnoses.

Methods: 244 adolescents with autism ($n=78$, 23F), anxiety ($n=106$, 69F), or neurotypical development ($n=56$, 27F) completed the CAT-Q as part of a larger study. The CAT-Q includes 25 questions related to social adaptation across 3 domains: compensation, assimilation, and masking. Two-way ANOVAs examined effects of sex and diagnosis on CAT-Q subscores, with Tukey's HSD post-hoc tests for planned pairwise comparisons. Pearson correlations tested the relationship between self-reported anxiety (MASC; March, 2012) and overall CAT-Q scores.

Results: Results revealed a main effect of diagnosis on social compensation ($F=15.97$, $p<.001$) and assimilation ($F=34.88$, $p<.001$) but not masking ($F=0.76$, $p=0.47$), such that compensation and assimilation scores were higher in ANX and AUT ($ps<.001$) vs. NT. There was a significant main effect of sex on all measured aspects of social adaptation: compensation ($F=13.60$, $p<.001$), assimilation ($F=17.28$, $p<.001$), and masking ($F=10.66$, $p<.01$). Planned post-hoc comparisons revealed that social adaptation was consistently higher in females than males (all $ps<.01$). No other main effects or interactions emerged. Pearson correlations revealed a strong positive dimensional relationship between anxiety and social adaptation across sex and diagnosis (Spearman=0.68, $ps<.001$).

Conclusions: Autistic and anxious adolescents report more compensation and assimilation behaviors than typically developing peers, which is consistent with previous literature (Pyszkowska, 2024; Lorenz & Hull, 2024). Furthermore, adolescent females, regardless of diagnosis, report engaging in more social adaptation than males. Extreme social adaptation (also known as camouflage or masking) is a transdiagnostic risk factor for poor mental health, but lower levels can be normative during adolescence. Additional research is needed to gain a better understanding of how anxious and autistic youth utilize social adaptation, and how exactly it affects their social and psychological well-being during this critical developmental window.

310.003 Anxiety Diagnoses in Very Young Autistic Children with Varying Intellectual Abilities

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Background: Autistic youth are at increased risk for anxiety disorders, which significantly impact daily functioning and quality of life. Little is understood about anxiety symptoms and diagnoses during early childhood, when intervention may be most impactful, particularly in children with co-occurring intellectual disability (ID). Two recent studies reported high rates of anxiety diagnoses in autistic preschoolers (Chan et al., 2023: 65.2%; Vasa et al., 2023: 26.7%). However, both studies relied heavily on clinical diagnostic interviews designed for older children, which may be less accurate in early childhood, when the manifestation of anxiety symptoms is quite different. Furthermore, increased diagnostic complexity due to co-occurring intellectual and/or language impairment requires multi-method assessments that integrate direct observations and clinical judgment in autistic children.

Objectives: (1) Characterize rates of DSM-5 anxiety diagnoses in autistic preschoolers with varying intellectual abilities utilizing a clinical best estimate (CBE) diagnostic procedure that incorporates multiple sources of information; and (2) Determine whether anxiety diagnoses are associated with sex at birth or common indicators of autistic heterogeneity (e.g., IQ, language level).

Methods: Participants included 47 autistic preschoolers [$M(SD)$ age=3.59(0.47) years; 85.11% male] and 31 non-autistic (NA) preschoolers [$M(SD)$ age=3.43(0.64) years; 77.42% male]. Groups were similar on chronological age, $t(76)=1.26$, $p=.212$, and sex distribution, $\chi^2(1)=0.75$, $p=.387$. The autism group had significantly lower IQ, $t(76)=13.88$, $p<.001$, and 78.72% ($n=37$) had IQs<70. DSM-5 anxiety diagnoses were determined through a clinical best estimate (CBE) diagnostic review procedure that incorporated information from a clinical diagnostic parent interview designed for preschool-aged children (the Preschool Age Psychiatric Assessment), direct observations, parent-report questionnaires (e.g., the Preschool Anxiety Scale-Revised), and clinician judgment.

Results: Twenty-two (46.81%) autistic preschoolers met diagnostic criteria for a DSM-5 anxiety disorder, compared to eight (25.81%) NA preschoolers, $\chi^2(1)=3.48$, $p=.062$. Specific phobia was the most common diagnosis in the autistic preschoolers (38.30%; $n=20$) and was diagnosed at significantly higher rates than in the NA group, $\chi^2(1)=5.95$, $p=.015$ (Table 1). Rates of anxiety diagnoses were similar across the following autism subgroups (a) children with IQ <70 v. those with IQ ≥70, (b) speaking v. nonspeaking children, and (c) males v. females, all $\chi^2 \leq 1.10$, $ps \geq .295$.

Conclusions: Our study suggests that when a multi-method CBE diagnostic process is utilized, nearly half of autistic preschoolers meet diagnostic criteria for a DSM-5 anxiety disorder. This rate falls between those recently reported by two studies that relied primarily on clinical diagnostic interviews designed for older children. Importantly, our findings also suggest that during the preschool developmental period, risk for DSM-5 anxiety disorders does not vary by sex, IQ, or language level. In line with previous work, specific phobia was the most common DSM-5 disorder in our preschool-aged sample. Given evidence from studies of NA children that specific phobia in early childhood increases likelihood for later onset of a variety of mental health problems, future studies should investigate whether early specific phobia impacts long-term mental health outcomes in autistic children.



310.004 Early Childhood Brain Structure Predicts Later Emergence of Specific Phobia Differently in Autistic Youth with and without Intellectual Disability

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Background: Autistic individuals often experience severe anxiety (Kerns & Kendall, 2012; South & Rodgers 2017). Specific phobia is among the most predominant anxieties in autistic youth, especially autistic youth with an intellectual disability (ID) (Kerns et al., 2021). Theoretical models of specific phobia suggest that heightened sensory responsivity, which is often experienced by autistic individuals, leads to maladaptive learning and ultimately extreme fear of something that poses no true danger (Green & Ben-Sasson, 2010). While many brain structures contribute to heightened sensory responsivity and sensory-based learning in autism, differences in the striatum may be particularly important for the development of specific phobia as the striatum integrates sensory information with cognitive and affective information to drive learning (Parkinson et al., 2009). However, it is still unknown if early differences in striatal structures influence sensory-based learning and drive later emergence of specific phobia in autism. Further, it remains unclear if these mechanisms are similar or different in autistic youth with and without ID.

Objectives: 1) Determine if early development of striatal structures predicts later childhood specific phobia in autism 2) Evaluate striatal-specific phobia associations in autistic youth with and without ID.

Methods: Early childhood striatal volume (2.0 - 4.5 years) as well as middle childhood specific phobia and intellectual ability (9.1 - 13.7 years) were collected from 67 autistic individuals (15 female). Striatal volume was parcellated into substructures associated with different aspects of sensory (putamen), cognitive (caudate nucleus), and affective (nucleus accumbens) processing using a multi-atlas approach (Mori et al., 2016). Clinically significant specific phobia was assessed using the ADIS-ASA (Kerns et al., 2017) and intellectual ability was assessed using the Differential Ability Scales-II (Elliot et al., 2007). ID was operationally defined as IQ<70. Logistic regression determined if early childhood striatal volumes differently predicted later childhood specific phobia in autistic individuals with and without ID.

Results: 61% of autistic participants had specific phobia and 28% had ID. 57% of the participants with ID had specific phobia. Larger putamen (Fig A, Left: $p=.04$, Right: $p=.03$) and left nucleus accumbens ($p=.02$) volumes during early childhood were significantly associated with the later emergence of specific phobia, regardless of ID status. However, ID did influence the associations among early childhood volumes of both the bilateral caudate nucleus (Fig B, Left: $p=.04$, Right: $p=.02$) and right nucleus accumbens (Fig C, $p=.04$) and later childhood specific phobia. Specifically, for autistic children with ID, larger early childhood striatal volumes were predictive of later specific phobia but there were no significant associations in autistic children without ID.

Conclusions: Results suggest that unique brain mechanisms related to different aspects of sensory integration and striatal-based learning may contribute to specific phobia in autistic youth with and without ID. While early differences in striatal-based sensory processing contribute to specific phobia across autistic individuals, early differences in striatal-based cognitive and emotional integration additionally contribute to specific phobia in autistic individuals with ID. These distinct associations suggest that early patterns of striatal differences may be viable markers of future anxiety in subgroups of autistic youth.



Oral Session -**311 - Autism in Underserved Communities: Diagnosis, Service Utilization, and Culturally Inclusive Interventions**

May 1st, 2025, 3:00 PM - 4:00 PM - 611-614

Moderator: Shoba Meera, *National Institute of Mental Health and Neurosciences (NIMHANS), Bangalore, Karnataka, India*

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311.002 Advancing the Diné (Navajo) Parents Taking Action Program: Findings and Future Directions from a Mixed Methods Pilot Study*C. L. Running Bear¹, D. E. Henderson², B. R. Kirby³, A. Johns³, R. L. Whitman³ and O. J. Lindly³, (1)Western New Mexico University, Gallup, NM, (2)Communication Sciences and Disorders, Northern Arizona University, Flagstaff, AZ, (3)Health Sciences, Northern Arizona University, Flagstaff, AZ*

Background: Parents Taking Action (PTA) is an evidence-based autism parent education and training program originated for Latinx immigrant families in the United States. PTA uses a community health worker delivery mode whereby parents of a child with autism (i.e., family advisor) are trained to deliver PTA lessons to other parents in the same community who have a child with autism (i.e., parent participant). PTA has been adapted for various communities (e.g., Black/African-American, Chinese, Colombian) using the Ecological Validity Framework. Recently, PTA was adapted for Navajo (hereafter Diné) families (Figure 1). Information is needed on the fidelity, feasibility, acceptability, and initial outcomes of the Diné program so it may be further improved, more rigorously tested, and spread to other rural and Indigenous communities who lack culturally responsive autism services.

Objectives: We examined the fidelity, feasibility, acceptability and initial outcomes of the adapted Parents Taking Action program for Diné parents of children with autism ages 2-12 years.

Methods: A convergent mixed methods study was conducted from 2022 to 2024 with 13 Diné mothers who had a child with autism. Fidelity was assessed using checklists completed by family advisors and study team members. Feasibility was determined by the number of participants enrolled and the number of lessons completed. Acceptability and initial outcomes were assessed through parent reported surveys including measures of social validity, as well as child and parent outcomes. Qualitative data on program acceptability were also collected from family advisors and participants. Descriptive and bivariate statistics were computed for quantitative data, and thematic analysis was used for qualitative data.

Results: High fidelity was reported by the family advisors: 109 lessons (out of the 110) had 100% fidelity, and one lesson had 86% fidelity. Of the 13 parents enrolled, nine completed all program lessons and surveys, and ten completed all or some of the lessons, indicating reasonable feasibility. Social validity questionnaire results indicated high acceptability. Family advisors reported that parent participants enjoyed the program including the ability to connect with someone they could identify with. Family Outcome Survey results indicated high reliability overall and on all subscales (understanding child's strengths, needs, & abilities; knowing your rights and advocating for your child; helping your child develop and learn; having support systems; accessing the community) and improvement when comparing the baseline and completion survey scores (Table 1).

Conclusions: The Diné PTA program was delivered with high fidelity, was feasible and acceptable, and showed promising initial outcomes. As of April 2024, the Diné PTA is being sustained and spread through the Autism Support, Community, and Education in the Navajo Nation through the Diné Parents Taking Action (ASCEND) project in partnership with a 638 clinic within Navajo Nation. ASCEND includes a randomized waitlist control trial with 25-30 Diné parents/guardians of children with autism to better determine the effectiveness of the Diné PTA program regarding parent/family and child outcomes. This research is advancing health equity for Diné families, so the adapted program can be delivered to more Diné families and other tribal and/or rural communities in the future.

**311.003** Age at Diagnosis, ASD-Service Utilization, and Presence of an IEP in Spanish- and English-Consented Latino Children in SPARK*K. Cortese¹, A. Daniels¹, O. Kanoute¹, J. Polite¹ and W. Chung², (1)Boston Children's Hospital, Boston, MA, (2)Department of Pediatrics, Boston Children's Hospital, Boston, MA*

Background:

SPARK launched in 2016 to recruit and retain a cohort of individuals with autism and their family members across the United States. In 2022, enrollment opened to Spanish-speakers. The experience of Spanish-speaking Latinos with autism in the United States is not well documented, given challenges with recruitment and retention (Burkett et al., 2021). Autism prevalence is lower in regions with more Spanish-speaking households (Dickerson & Dickerson, 2020). Autistic Latinos, regardless of language, face disparities in access to services (Blacher et al., 2019). Few studies have examined the heterogeneity within the broader Latino autism community (Elliott et al., 2022). More research should examine within-group differences, given the exclusion of non-English-speaking individuals from much pediatric health research (Chen et al., 2022).

Objectives:

To examine differences in age at autism diagnosis, ASD service utilization, and presence of an IEP between Spanish- and English-consented Latino children in SPARK.

Methods:

A total of 3,885 Latino individuals were included, 555 autistic children whose guardians consented to their participation in Spanish from 2022-2024, and 3,330 autistic children whose guardians consented in English in the same period. Given differences in participation by method of recruitment (Daniels et al., 2023) individuals not recruited by a clinical site were excluded. Data utilized in this analysis included information about autism diagnosis, service utilization, and clinical and sociodemographic characteristics. The adjusted association between language of consent (English or Spanish) and age at diagnosis was examined using linear regression. Logistic regression was used to examine adjusted odds of service utilization and IEP utilization by language of consent.

Results:

Most children were male, with a mean age of 6 years at enrollment for the English-consented and 7 years for the Spanish-consented children. Their racial identities were heterogeneous; half of Spanish-consented children identified as “other” or “more than one” race and lived in the south. The Spanish-consented group had lower language levels and were more likely to have cognitive impairment. After controlling for known confounders, Spanish-consented children were diagnosed 6 months earlier than their English-consented counterparts ($p < .001$). The adjusted odds of ASD service utilization and having an IEP were respectively 1.65 and 1.46 for Spanish-consented children, compared with the English-consented children (95% CI [1.28, 2.13]; 95% CI [1.2, 1.8]).

Conclusions:

A younger age at diagnosis and higher utilization of services and IEPs for Latino children with autism enrolled by their Spanish-speaking guardian, compared to those enrolled by English-speakers, suggests a diagnostic severity bias. The study did not include a measure of socioeconomic status, and ascertainment by clinical sites may limit generalizability. Future research should examine differences in diagnosis, treatment, and outcomes among Latinos with autism by sociocultural and demographic factors, accounting for the role spoken language plays in moderating developmental trajectories.



311.004 Exploring the Association between Autism Spectrum Disorder and Immigration in Manitoba, a Population-Based Approach
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Background: Higher rates of autism spectrum disorder (ASD) among immigrants have been described in several countries. We previously conducted the first ever Canadian study examining this association; a retrospective review that identified an overrepresentation of immigrant families among children ≤ 6 years diagnosed with ASD at Manitoba's primary and only publicly funded site for ASD assessment, the Rehabilitation Center for Children (RCC). While a useful first step, the study lacked granular data on immigration. We now aimed to further research this association by examining population-level data.

Objectives: To determine differences in the incidence of ASD among children ≤ 6 years of age living in Manitoba during May 2016-December 2022 who belong to immigrant vs. nonimmigrants families, and related factors.

Methods: We linked the RCC ASD dataset to the Manitoba Population Data Repository, which contains health, education, sociodemographic (including immigration) data from all Manitoba residents. Children were classified as: Group 1- no immigration, Group 2 - one/both parent(s) immigrants + child born in Canada, Group 3 - parents and child immigrants to Canada. Sociodemographic information including country of origin and refugee status was collected. Diagnoses of ASD at RCC were made by developmental pediatricians and/or psychologists. Cumulative incidence of ASD (95% CI) was calculated for each group; adjusted relative risk (RR) with 95% CI were calculated to compare groups.

Results: Cumulative incidence of ASD per 1000-person, and adjusted RR according to immigration is shown in Table 1. Among those in Group 3, when risk was calculated by child's age of arrival to Canada (<3 years vs. ≥ 3 years (ref.)), adjusted RR for those who arrived at <3 years of age was 6.60 (4.52, 9.63). Association between immigration characteristics and ASD by region of origin and refugee status is shown in Table 2.

Conclusions: This population-based Manitoba study identified an increased incidence of ASD among children of immigrant families, especially among those born in Canada or those who immigrated within the first three years of life. While a non-European region of origin was associated with an increased risk for ASD, refugee status was not. Further studies are needed to better understand the association between ASD and immigration.



Oral Session -

312 - How Do We Measure Linguistic Knowledge?

May 1st, 2025, 3:00 PM - 4:00 PM - 608-609

Moderator: Rhiannon Luyster, Communication Sciences and Disorders, Emerson College, Boston, MA

312.001 Anticipatory Language Processing in Autism: Evidence from Eye-Tracking in Preschool-Aged Children

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Background: Anticipatory language processing, the ability to anticipate upcoming words in spoken discourse, is a crucial component of efficient language comprehension. Previous studies have shown that neurotypical (NT) children's anticipatory language processing skills pave the way for fluent communication and social interaction. However, the extent to which autistic children engage in anticipatory language processing remains less understood. Given that autistic children often experience difficulties in language skills, it is important to examine whether these challenges extend to anticipatory language processing. Understanding these differences in early language development may provide insight into the unique cognitive and linguistic profiles of autistic children, offering potential pathways for tailored interventions.

Objectives: This study aims to investigate the anticipatory language processing of preschool-aged autistic children using eye-tracking techniques.

Methods: The study included 45 autistic children (5 females; $M_{age} = 5.67$, $SD = 0.98$, range = 3.80-8.05) and 52 age-, gender- and verbal-IQ-matched NT children (7 females; $M_{age} = 5.40$, $SD = 0.92$, range = 3.02-7.04). Children completed an eye-tracking task adapted from the visual world paradigm. In the task, participants heard subject-verb-object sentences that contained two semantically informative cues (an agent and an action) that corresponded to the sentence-final patient. As the sentences were spoken, participants viewed visual arrays containing four images (Figure 1): target patient, agent-related distractor, action-related distractor, and unrelated distractor. Children were told to point to the image that matched the sentence they heard. Upon hearing the verb, children should have gathered sufficient information to generate anticipatory looks to the target.

Results: We employed two complementary analytical approaches: the growth curve analysis (GCA) and the divergence point analysis (DPA). The GCA examined group differences in the overall trajectory of fixations, whereas the DPA offers a more fine-grained analysis of when anticipatory looking emerged. The GCA revealed a significant main effect of group ($\beta = -0.15$, $p < .001$), with the autistic group showing lower overall fixation proportions to the Target than the NT group, and a significant interaction between the linear time term and group ($\beta = -0.87$, $p < .001$), indicating that the autistic group exhibited a slower rate of increase in fixation proportions to the Target over time compared to the NT group. The DPA revealed that the NT group reached the divergence point (where anticipatory looking to the Target rather than the Agent-related distractor emerged) significantly earlier than the autistic group ($p < .001$). Specifically, the estimated divergence points for the NT group occurred at 1254.20 ms (95% CI [1150, 1350]) after the sentence onset, whereas for the autistic group, it occurred at 1415.46 ms (95% CI [1350, 1500]; Figure 2).

Conclusions: Findings suggest that autistic children exhibit delayed and less robust anticipatory language processing compared to their NT peers, as manifested by the slower rate and later emergence of anticipatory looks. This delay could contribute to broader challenges in language comprehension and social communication in autistic children. The results underscore the importance of early identification and intervention strategies tailored to support language processing skills in autistic children.

**312.002** Grammatical Markers Development in Mandarin-Speaking Autistic Children: Quantitative but Not Qualitative Variations

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Background: Past research has revealed large variations in language profiles, including the morphosyntactic domain, between typically developing (TD) and autistic children (e.g., Brynskov et al., 2017; Su & Naigles, 2023). However, little is known about such variations were *quantitative* (e.g., different acquisition rates) or *qualitative* (e.g., different developmental trajectories, different ultimate acquisition outcomes), which provides new insights into the relationship between language and cognition. In addition, most of previous autism research has focused on the development of English grammatical markers (e.g., -ing, -ed), and no studies have yet examined how grammatical markers develop in Mandarin-speaking autistic children. Different from English, Mandarin Chinese has no inflectional morphemes. A recent study by Huang et al. (2022) found their TD participating children acquired Mandarin grammatical markers in a different pattern from English children. This implies Mandarin-speaking autistic children may experience particular difficulties, which calls for specific research on Mandarin.

Objectives: This study aimed to compare the development of a wide range of Mandarin grammatical markers (e.g., aspect markers, negative markers, etc.) between Mandarin-speaking TD and autistic children.

Methods: Data were collected at three timepoints with 80 autistic children ($M_{age} = 43.11$ months, $SD = 9.64$; 67 boys) at Time 1, 52 ($M_{age} = 49.21$ months, $SD = 10.06$; 43 boys) at Time 2, and 10 ($M_{age} = 62.2$ months, $SD = 12$; 8 boys) at Time 3. At each timepoint, their caregivers reported their child's language performance using the Chinese Communicative Development Inventory Putonghua (Mandarin) version (CCDI-P; Tardif and Fletcher, 2008). Following the grammatical marking rescoring method used by Huang et al. (2022), all Mandarin grammatical markers (see Table 1 for the full list) were coded in the grammatical complexity section of the CCDI-P. We ranked the acquisition order for all the markers based on parents' reports. Finally, we compared our autistic children's results with that of Huang et al.'s (2022) TD participants ($M_{age} = 26.98$ months, $N = 338$).

Results: We found a clear acquisition order of Mandarin grammatical markers (see Table 1). Furthermore, Kendall's rank correlation suggested a significant correlation between autistic and TD children's acquisition orders ($\tau = .71, p < .001$), though autistic children's scores of all 14 grammatical marker categories were significantly lower than that of TD children ($t(13) = 8.05, p < .001$).

Conclusions: It suggested although autistic children acquired the grammatical markers at a slower rate, their developmental trajectories were similar to that of TD children. This supports the hypothesis that autistic children's language development is quantitatively but not qualitatively different from those of TD children. The results of Time 3 suggested autistic children may eventually catch up and acquire most of the grammatical markers (except for markers aspect "zheng4" and negative "bie2").

Significance: This is the first large-scale study that comprehensively investigates Mandarin-speaking autistic children's development of morphosyntax. The findings have critical implications for language acquisition theories and intervention research, especially for China, which has a large population of autistic children.



312.003 Parent Underestimations of Verb Vocabulary in ASD and TD

K. J. LeGrand and L. R. Naigles, *Psychological Sciences, University of Connecticut, Storrs, CT*

Background: Development of verb vocabulary is a growing area of interest in ASD, likely due to the integral role of verbs in language acquisition. Two tools employed to measure children's verb vocabulary are spontaneous language samples and parent-report measures (e.g., MacArthur-Bates Communicative Development Inventory [CDI]; Fenson et al., 1993). However, these two tools can yield incongruent results: parent report is less consistent and accurate for verbs than nouns in ASD and TD (Arunachalam et al., 2022; Kover et al., 2023), and parents of lower-verbal children with ASD underestimated their child's grammatical development more frequently than parents of children (TD, ASD) with higher language skills (Jyotishi et al., 2017). Thus, verbs and children with ASD with poorer language seem disproportionately affected by underestimation on parent reports. Prior work reporting verb-related shortcomings of the CDI included young children aged 1.5-3.5 years; we study a later timepoint (2-4 years), when some children have progressed linguistically and others remained delayed, to ask whether these issues (underestimation for verbs and for autistic children with language challenges) compound over time.

Objectives: To compare children's verb production (TD, ASD) via spontaneous language samples and parent report.

Methods: 67 children ($N_{ASD}=32$; $N_{TD}=35$) from a longitudinal dataset (Naigles & Fein, 2017) participated in six parent-child play sessions (V1-V6), each four months apart. Here, we analyze data from V2 and V3. Parents reported children's vocabulary on the CDI Words and Sentences form. Play sessions were transcribed, and verbs were extracted. We calculated number of underestimations (i.e., verbs produced in the play sessions that parents marked as "not produced" on the CDI) for each child at each visit (Table 1). We ran a linear mixed effects model predicting number of underestimations, with fixed effects of group (ASD vs. TD), visit (V2 vs. V3), number of different words (NDW) calculated from the transcripts, and interactions, with random slopes by participant for verb vocabulary.

Results: 21 parents in the ASD group and 34 in the TD group underestimated their children's verb vocabulary. Models revealed fixed effects of group (more underestimations for TD than ASD), visit (more underestimations at V3 than V2), and NDW (more underestimations at higher NDW; Figure 1a). There were significant interactions between group and visit (underestimations in the ASD group did not change from V2 to V3, but underestimations in the TD group did; Figure 1b) and between NDW and visit (relationship between NDW and underestimations was stronger at V3 than V2).

Conclusions: Especially at V3, parents of TD children underestimated their children's verb production at higher rates than parents of children with ASD. In both groups, parents of children with larger vocabularies underestimated more verbs than parents of children with smaller vocabularies. More underestimations may be due to fewer language-related concerns among parents of children with better language, possibly leading to less attention to/inaccurate reporting of individual words. Contrary to predictions, these results suggest that the CDI may be a valid measure for children with ASD and language issues, but a more problematic measure for children developing typically.



312.004 An Innovative Tool to Evaluate Politeness Use in Autistic Youth

H. E. Elsayed¹, K. Reduzzi¹, P. Meulenbroek², D. Sullivan¹ and H. Genova¹, (1)Kessler Foundation, East Hanover, NJ, (2)Radford University, Radford, VA

Background: Employment plays a vital role for adults with Autism Spectrum Disorder (ASD), as it not only provides financial independence but also promotes meaningful social connections and community involvement. Difficulties with pragmatic language skills, which are essential for social interactions, can hinder the ability to develop and maintain effective work relationships which is a crucial component of successful employment. A fundamental pragmatic skill in workplace communication is the appropriate use of politeness, which involves recognizing and considering the feelings and thoughts of others. Politeness can be evaluated using politeness markers (PMs). PMs are categorized into two types: positive PMs, which convey appreciation or praise, and negative PMs, which aim to prevent conflict by showing consideration for the listener's feelings.

Objectives: This study investigates the effectiveness of an employment-focused social communication assessment tool, the Voicemail Elicitation Task (VET), in individuals with ASD. VET is a language sampling procedure which measures PMs in employment-based scenarios.

Methods: The current cohort comparative study involved a sample of young adults with ASD ($n = 65$) and neurotypical controls (NTC; $n = 26$), aged between 15 and 26 years. All participants completed the VET, a standardized computerized language sampling procedure designed to evaluate politeness markers (PMs) during work-related role-play scenarios. The primary measure of the VET is PMs per minute (PMpM), calculated by dividing the total number of PMs by the speaking time in minutes. A higher PMpM indicates greater use of politeness markers, while a lower PMpM reflects less use. Additionally, parent reports were collected using the Social Responsiveness Scale, 2nd edition (SRS-2), to assess the severity of social challenges.

Results: The preliminary results showed that participants with ASD had a significantly lower total PMpM (mean = 13.72, SD = 5.00) compared to NTCs (mean = 18.35, SD = 4.79), with $p < .001$. Post hoc analysis revealed that this group difference was primarily due to the ASD participants using significantly fewer negative PMs (mean = 6.31, SD = 3.12) than the NTC group (mean = 10.54, SD = 3.62), $p < .001$. However, both groups had similar levels of positive PMs use ($p = 0.569$). Additionally, significant negative correlations were found between total negative PMpM and the SRS total score ($r = -.321$, $p = .002$), as well as with the SRS subscales for social communication and interaction ($r = -.320$, $p = .002$), social awareness ($r = -.321$, $p = .002$), and social cognition ($r = -.360$, $p < .001$).

Conclusions: This study indicates that the VET could be used as a potential screening tool to predict performance of autistic individuals in employment settings. The findings suggest that people with ASD exhibit differences in PMs use, that could possibly affect their interpersonal relationships in the workplace. Understanding differences in politeness use can potentially lead to designing interventions that could help in improving employment outcomes in this population.

Oral Session -

313 - Rare Genetic Models in Autism 2

May 1st, 2025, 3:00 PM - 4:00 PM - 606-607

Moderator: Jacob Ellegood, Bloorview Research Institute, Holland Bloorview Kids Rehabilitation Hospital, Toronto, ON, Canada

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313.002 Investigating Sleep Disruptions in a CHD8 Haploinsufficient Mouse Model Using Behavioral and Electrophysiological Methods

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Background: Mutations in the gene Chromodomain Helicase DNA Binding Protein 8 (*CHD8*) are linked to an increased likelihood of autism diagnosis in people. *CHD8* acts as a transcriptional regulator during neurodevelopment, and a loss of function (LOF) of *CHD8* has been shown to disrupt gene regulatory networks during this critical period (Yim et al. 2024). People with *CHD8* LOF mutations have reported disrupted sleep (Dingeman et al., 2022; Bernier et al., 2014; Coll-Tané et al., 2021). Animal models with LOF mutations in *CHD8* have also supported a role in sleep: reduction of the gene *kismet*, the *Drosophila* ortholog of *CHD8*, was associated with difficulty falling asleep as well as frequent and prolonged awakenings at night (Coll-Tané et al., 2021), and zebrafish with mutations in *chd8* showed decreased sleep length and increased number of rest bouts (Weinschutz Mendes et al., 2023). Utilizing a mouse model of *CHD8* haploinsufficiency (*Chd8*^{+/−}), we investigated the effect of *CHD8* disruption on the sleep architecture of adult mice using behavioral and electrophysiological methods.

Objectives: We used Piezo sleep boxes to behaviorally assess sleep in *Chd8*^{+/−} mice. Piezo sleep boxes are highly sensitive to breathing movements and can quantify the respiratory rate of mice by detecting the frequency of chest wall extensions which are a reliable marker of sleep states (Vanneau et al., 2021). Following the Piezo box analysis, we assessed sleep in the same cohort using video-EEG/EMG, to confirm our findings and to detect different sleep states. We hypothesized that we would see decreased sleep length and increased number of sleep bouts in a the *Chd8*^{+/−} mouse.

Methods: All experiments were conducted on a 12-hour light/dark cycle. We used Piezo boxes to assess sleep in a cohort of 32 mice of both sexes (8 animals per group). Data analysis (excluding the first day) was conducted using SleepStats, ClockLabs, and Prism. We then implanted head mounts to record brain activity in same-sex pairs for three days and nights with EEG and movement with EMG using Pinnacle Inc.'s tethered system. Data was recorded using the Sirenia package, and analyzed using a custom MatLab script.

Results: In the sleep boxes, *Chd8*^{+/−} mice showed an increase in number of sleep bouts and sleep length, and a decrease in sleep bout length. These results validate the sleep disturbance issues observed in *Drosophila* and zebrafish models of *CHD8* loss. Our initial analysis of EEG/EMG recordings found that *Chd8*^{+/−} mice exhibited a significant increase in total duration of sleep, as well as time in REM sleep. An increase of the number of REM bouts in the *Chd8*^{+/−} mice compared to the WT mice approached significance.

Conclusions: Overall, using behavioral methods we observed similar phenotypes of sleep disruption in *Chd8*^{+/−} mice compared to other animal models of *CHD8* loss, while differences in sleep state architecture were implicated using video-EEG/EMG studies. Cross-validation across additional cohorts and in conditional mouse models is on-going, and will further our understanding of the biological mechanisms regulating *CHD8* loss-related sleep disturbance.

313.003 Production of a Nonhuman Primate Model of the CHD8 Form of Autism Spectrum Disorder

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Background: Autism Spectrum Disorder is an incredibly heterogeneous condition with varied co-occurring symptomatology and multiple genetic risk factors. We have been particularly interested in one form of autism that manifests with profound core and co-occurring symptoms as well as macro- or megalencephaly. Children with this form of autism have intellectual disability with meager gains in IQ during childhood and impoverished language function. They benefit less from standard behavioral therapies and thus have a poorer prognosis than autistic children with normal brain size (Amaral et al., 2017). While many genetic variants are associated with autism and megalencephaly, one gene that has gained substantial attention codes for chromodomain-helicase-DNA-binding protein 8 (*CHD8*). *CHD8* is a chromatin modifier that affects thousands of genes throughout the genome. An initial publication by Bernier et al. (2014) identified a human phenotype of *CHD8* mutation that included a diagnosis of autism, macrocephaly or megalencephaly, intellectual disability, specific facial features, gastrointestinal problems, and sleep disorders. While most autism risk genes are not highly penetrant, loss of function mutations of *CHD8* produce autism in 87% of individuals and 80% demonstrate macrocephaly. While several *Chd8* modified mouse models have been produced, none have captured the full phenotypic profile of human *CHD8* autism.

Objectives: We have endeavored to produce a rhesus monkey model of CHD8 autism by using CRISPR-cas9 and in vitro fertilization technologies. Studies were carried out both at the California National Primate Research Center and the Oregon National Primate Research Center (ONPRC).

Methods: We first designed two guide RNAs (gRNA) to target the upstream and downstream introns of a *CHD8*. Our CRISPR-Cas9 strategy uses two guide RNAs targeting introns flanking *CHD8* exon 4 at the zygote stage to generate exon-specific deletions, disrupting normal *CHD8* reading frame. Mature oocytes were harvested from superovulated females, which were inseminated through in vitro fertilization; presumptive zygotes were injected with the two gRNAs and Cas9 mRNA. Embryos that advanced to blastocyst stage underwent trophectoderm biopsy for genotyping and vitrification for later transfer to female surrogates.

Results: We injected 231 zygotes that resulted in 23 blastocysts, 10 of which had two distinct PCR bands, one indicating exon deletion and another represented non-deleted exon 4, confirmed by Sanger sequencing. These were transferred to 7 females, leading to a first pregnancy of an edited fetus. This pregnancy resulted in a live birth on September 29, 2024. Both mother and *CHD8* edited infant are healthy and developing as expected. Behavioral evaluations are underway, and initial MRI analysis will occur at 30 days and then periodically thereafter. Initial blood genotyping indicates that the infant carries the targeted *CHD8* exon 4 deletion mutation, and the allele is well represented in blood DNA.

Conclusions: Efforts are underway to produce additional *CHD8* edited animals to verify phenotypic characteristics and analyze neurobiological features of this form of autism.

313.004 Cerebellar Pathogenesis in CHD8 Haploinsufficient Mice: Implications for Autism Spectrum Disorder.

C. P. Canales¹, N. Seban², K. Cichewicz², S. Lozano², K. Jackson², D. Rahbarian², M. Corea², A. Kopley-Smith², M. Ramachandran², D. Fioravante³ and A. S. Nord¹, (1)Department of Psychiatry and Behavioral Sciences, UC Davis Center for Neuroscience, Davis, CA, (2)UC Davis Center for Neuroscience, Davis, CA, (3)Neurobiology, Physiology and Behavior Center for Neuroscience, UC Davis Center for Neuroscience, Davis, CA

Background: The cerebellum (CB) is well-recognized for its essential role in proprioception and motor control, but emerging evidence strongly implicates it in higher-order cognitive functions linked to intellectual disability and Autism Spectrum Disorder (ASD). Despite this, the non-motor contributions of the CB remain underexplored in ASD research. Mutations in the chromatin-remodeling factor CHD8 are highly associated with ASD, and studies in *Chd8* haploinsufficient mouse models have primarily focused on forebrain abnormalities, particularly in the cerebral cortex, where ASD-relevant genomic, neuroanatomical, and behavioral disruptions have been identified. However, our initial studies using these *Chd8* mice reveal region-specific perturbations in the CB, although the molecular pathology at a cell type-specific level remains unknown.

Objectives: We aimed to investigate cerebellar pathogenesis in *Chd8* haploinsufficient mice by characterizing cell type-specific molecular and epigenetic changes, including differential gene expression and chromatin accessibility, using snRNA-seq and snATAC-seq. We also sought to assess developmental trajectory disruptions through Pseudotime analysis, validate transcriptional and structural alterations via immunohistochemistry, RNA FISH, and electrophysiology, and explore the functional impact of these changes on circuit assembly and neuronal properties, particularly focusing on Purkinje neurons and molecular layer interneurons.

Methods: By pairing snRNA-seq and snATAC-seq, we integrate differential gene expression (DE), chromatin accessibility (DA), and developmental trajectory analysis (Pseudotime) to characterize cell type-specific developmental molecular pathogenesis. Gross neuroanatomy was assessed through immunohistochemistry (IHC), while RNA fluorescence in situ hybridization (FISH) used to validate cell type-specific DE. Additionally, we analyzed electrophysiological properties of key CB neurons through patch-clamp recordings, and assessed their morphology via Sholl analysis.

Results: Our findings to date indicate no gross alterations in CB anatomy or major cell populations as assessed by IHC. However, we observed significant cell type-specific DE and associated DA in *Chd8* mutants, indicative of a broad developmental asynchrony phenotype, particularly in Purkinje neurons and molecular layer interneurons. This suggests potential disruptions in circuit assembly and function. Transcriptional perturbations in Purkinje neurons have been corroborated by functional assays, and further validation through electrophysiology and RNA FISH is ongoing.

Conclusions: Our initial results lay the groundwork for expanded future investigations, with the overarching aim of elucidating how *Chd8* mutations affect the development of specific cerebellar cell types and circuits, and how these alterations may contribute to ASD-relevant neuropathology.

Oral Session -**314 - Social Dynamics and Attention in Early Autism Development**

May 1st, 2025, 3:00 PM - 4:00 PM - 4C-1,2

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314.001 Familiarity of a Social Partner during Interactions Increases Attention in Toddlers with Autism: Evidence from a Live Eye Tracking Study**G. K. Bell**, S. Hamilton, P. G. Srinivasan, B. Gordon, S. Macari, A. Vernetti and K. Chawarska, *Child Study Center, Yale University School of Medicine, New Haven, CT*

Background: Differences in social attention are a defining feature of autism. Screen-based eye tracking studies highlight that limited attention to social partners is a promising biomarker of autism (Chawarska et al., 2013; Chita-Tegmark, 2016; Shic et al., 2019, 2023), but the familiarity of the social partner could modulate this effect. A live eye-tracking study of school-age children with and without autism showed no group differences in social attention to familiar vs unfamiliar adults during a painting activity (Clin et al., 2024), while other studies in live settings showed that children with autism were more attentive and socially engaged with familiar compared to unfamiliar adults during non-interactive and interactive play respectively (Kasari et al., 1993; Slaughter & Ong, 2014). The impact of familiarity on toddlers with and without autism in a live social interaction is has yet to be investigated.

Objectives: Investigate the impact of familiarity of the social partner (parent vs. examiner) in a live face-to-face interaction on social attention in toddlers with autism (AUT), neurodevelopmental conditions (NDC), and typical development (TYP).

Methods: Participants included 98 toddlers ($M_{age}=23.71$ months, $SD=5.85$), with AUT ($n=22$), NDC ($n=37$), or TYP ($n=39$). Participants were seated in a highchair across from a social partner, where gaze coordinates were collected using a Tobii Spectrum eye tracker. Each participant was administered eight 15-second trials in each of two conditions: parent and examiner. During the trials, the adult engaged the participant using ostensive cues including positive affect, eye contact, and child-directed speech, or they minimized gaze and speech. Trials were excluded if valid looking time was less than 15%, or calibration accuracy was below 1°. Attention to the social partner was indexed as a ratio of time looking at social partner/trial duration (%Person). A linear mixed model analysis was conducted with fixed factors of diagnosis (3) and condition (2).

Results: Analysis revealed a significant main effect of diagnosis ($F(2, 162.17)=4.04, p=0.014$), a marginally significant effect of condition ($F(1, 100.29)=3.44, p=0.067$), and a significant diagnosis by condition interaction ($F(2, 87.35)=3.20, p=0.046$). In the examiner condition, %Person in the AUT group was significantly lower than in the NDC ($p<0.001$) and TYP ($p=0.001$) groups. In the parent condition, %Person in the AUT group was comparable to that in the TYP group ($p=0.208$), but significantly lower than the NDC group ($p=0.042$). The TYP and NDC groups did not differ in %Person in the examiner ($p=0.989$) nor parent ($p=0.941$) conditions (Figure1).

Conclusions: When the social partner in a face-to-face interaction was an examiner, the toddlers with autism showed diminished attention compared to controls; however, when the social partner was a parent, the toddlers with autism showed social attention similar to typically developing peers. These findings indicate that face-to-face interactions with a familiar partner facilitates greater social attention in toddlers with autism. As concepts familiarity and predictability are intertwined, results of this study prompt further examination of such aspects on social differences in toddlers with autism.

**314.002** Caregiver-Infant Contingency in Dyadic Interaction: Evaluating Social Smiling Behaviors in Early Autism Development**J. D. Douglas-Brown**¹, E. Kushner^{1,2}, J. Jumbo³, H. Walum¹ and S. Shultz¹, (1)Marcus Autism Center, Emory University School of Medicine and Children's Healthcare of Atlanta, Atlanta, GA, (2)Department of Psychology, Emory University, Atlanta, GA, (3)Department of Neuroscience and Behavioral Biology, Emory University, Atlanta, GA

Background: Dyadic interactions between infants and their caregivers serve as a critical arena for infant socio-emotional development. These interactions aren't driven by either partner alone, but rather co-produced by caregivers and infants in tandem, with each partner adapting their behavior in an iterative, turn-taking fashion. Interactive behaviors promoting socio-emotional engagement, like smiling, are particularly foundational. Given that autism (ASD) is characterized by core differences in reciprocal social communication, early trajectories of social smiling may be differentiated for infants later diagnosed with autism (ASD infants). While previous studies report differences in social smiling in ASD infants compared to typically-developing infants by as early as 6-months of age (Lambert-Brown et al., 2015; Messinger & Fogel, 2007), few studies have investigated differences in social smiling in infants' first 6 postnatal months, the period during which social smiling first emerges and is then further refined via dyadic interaction.

Objectives: To 1) map trajectories of rate of smiling and shared-smiling (i.e., simultaneous infant and caregiver smiling) during dyadic infant-caregiver interactions between 2- and 6-months of age; and 2) identify when differences in smiling first emerge between ASD and typically-developing infants.

Methods: Preliminary analyses were conducted on a sample of 32 infant-caregiver dyads (53.1% ASD-infant, 43.8% female-infant, 68.8% White-infant, 38 sessions total). Dyads engaged in live, screen-mediated interactions between 2-6 months. Infants received autism diagnostic evaluations at 24- to 36-months. Unaware of infants' diagnostic outcomes, coders assigned binary codes to every frame (30 frames/second) of each interaction, indicating the presence or absence of a smile. The proportion of interaction time that infants and caregivers spent smiling, and the proportion of time spent in shared smiling was calculated. Generalized Additive Models (GAM) were used to construct trajectories of caregiver, infant, and shared smiling, and linear mixed-effect models were used to evaluate between-group smiling differences.

Results: ASD infants smiled less than typically-developing infants ($DF=28$, $t=2.342$, $p=0.027$), but caregivers' proportion of time spent smiling did not significantly differ between groups ($DF=30$, $t=1.558$, $p=0.130$). Typically-developing dyads spent significantly more time smiling simultaneously ($DF=30$, $t=2.985$, $p=0.006$). GAM models indicated a rapid increase in smiling for typically-developing infants from 2.7-4.2 months, consistent with prior reports of social smiling emergence in typical infancy. ASD infants did not show a significant increase in smiling rate until 4.3 months and the proportion of time they spent in shared-smiling remained low (see Figures 1&2).

Conclusions: Our findings suggest that social smiling—a critical social communicative milestone—is disrupted in infants later diagnosed with autism by as early as the second month of life. Smiling and shared smiling increased rapidly in typically-developing infants soon after month 2, whereas social smiling in ASD infants did not increase until 4.3 months and the proportion of time they spent smiling simultaneously with their caregivers remained low. These findings highlight how autism may alter the dynamics of infant-caregiver interactions, one of infants' earliest and most foundational learning experiences. Immediate next steps include coding of additional dyads and analyses of within-session temporal contingency.



314.003 Social Behaviors Forecast Physiological Regulation for Infants with ASD and TD Infants

J. Yurkovic-Harding^{1,2}, V. Narayanan³, J. E. Richards⁴ and J. Bradshaw⁴, (1)Department of Psychology, University of South Carolina, Columbia, SC, (2)Carolina Autism and Neurodevelopment Research Center, University of South Carolina, Columbia, SC, (3)Computer Science and Engineering, University of South Carolina, Columbia, SC, (4)University of South Carolina, Columbia, SC

Background: Infants rapidly gain social skills during the first months of life while undergoing significant physiological and neurodevelopmental growth. Physiological regulation, indexed by respiratory sinus arrhythmia (RSA), may significantly contribute to increasing social abilities, with high RSA supporting stimulus engagement (Richards, 1985) and later social abilities (Mateus et al., 2018). Accordingly, theories posit that RSA supports moment-by-moment social engagement (Porges & Furman, 2011), both of which are evidenced to be lower in infants and toddlers with ASD (Gangi et al., 2014; Patriquin et al., 2013). RSA predicts social outcomes in infants at elevated likelihood for ASD (Bradshaw & Abney, 2021), providing further evidence that physiological regulation may underly social development.

Objectives: The current study aims to address two major gaps in the literature. First, despite a theorized relationship, there is a paucity of research on the moment-by-moment dynamics of RSA and social behavior. Second, little is known about these dynamics in infants who later develop ASD. The current study therefore captures the directionality and strength of the temporal relationship between social behavior and RSA in young infants with and without ASD.

Methods: Infant heart activity was recorded during a 5-minute interaction with their caregiver when they were 3-, 4-, and 6-months old ($n=117$). Infants at elevated (EL, $n=34$) and low likelihood for ASD (LL, $n=83$) were determined to have ASD ($n=31$) or typical development (TD; $n=86$) between 24-36 months. Infant look to parent and smile were coded by reliable coders. RSA was calculated using a novel approach that allowed for continuous RSA estimation (3-second moving windows). RSA change (difference between RSA in sequential moving windows) was applied to a Granger causality analysis that assessed the degree to which look+smile together "forecasted" RSA change and vice versa. Generalized linear mixed models determined the effect of ASD-likelihood, diagnosis, and age on the proportion of infants for whom Granger causality was significant and on the strength of the relationship, determined by the log-transformed F-statistic.

Results: Look+smile significantly forecasted RSA change for 78% of infants, and the percentage increased with age ($F(1,94)=3.69$, $p=.05$; Figure 1). The strength with which look+smile forecasted RSA change increased substantially with age for EL-ASD infants and decreased with age for EL-TD infants ($F(1,71)=4.23$, $p=.04$; Figure 2). Conversely, RSA change forecasted change in look+smile for only 13% of infants, regardless of age, ASD-likelihood, or diagnosis (all $p>.46$).

Conclusions: Our findings revealed that infant social behavior precedes physiological responses, contrasting with theories that physiology begets social engagement. Further research that captures moment-by-moment physiological regulation may further elucidate the complex dynamics between social and physiological development. This is especially important for EL infants, who demonstrated a strong developmental relationship between RSA and social engagement. The developmental increase for EL-ASD infants in the strength in social-physiological dynamics suggests substantial task demands of face-to-face interactions and therefore strong recruitment of physiological systems. EL-ASD infants may therefore be less able to adapt to increasingly complex social interactions. Further, significant developmental change in social-physiological dynamics for EL infants may point to a genetic mechanism of psychophysiological development.



314.004 Social Context and Audiovisual Characteristics of a Stimulus Affect Consistency of Visual Attention in Autistic Toddlers
N. R. Fram¹, L. A. Edwards², W. Jones³ and M. D. Lense¹, (1)Vanderbilt University Medical Center, Nashville, TN, (2)Emory University School of Medicine, Marcus Autism Center, Atlanta, GA, (3)Marcus Autism Center, Atlanta, GA

Background: Autistic toddlers extract different information from complex social scenes than nonautistic peers (Jones & Klin, 2009), exhibiting more idiosyncratic attentional patterns when viewing scenes of others interacting (Avni et al., 2020). Such idiosyncrasies contribute to challenges developing social skills (Klin et al., 2015). However, these patterns may be impacted by social contexts and characteristics. In particular, child-directed song (CD-Song) is a highly appetitive dyadic activity for autistic and nonautistic toddlers (Lense & Camarata, 2020). CD-Song contains predictable temporal structure and patterns of audio and visual cueing that dynamically scaffold visual attention in nonautistic infants more strongly than dyadic, face-to-face engagement through child-directed speech (CD-Speech) (Alviar et al., 2023; Lense et al., 2022).

Objectives: We investigated how consistency of visual attention varies across common social contexts (peer interactions, CD-Song, and CD-Speech) in autistic and nonautistic toddlers. We also explored how characteristics of CD-Song (i.e., temporal predictability, visual motion, and audio volume) affected consistency of visual attention.

Methods: Autistic (n=81, 64 male) and nonautistic (n=61, 32 male) toddlers between 14 and 40 months old were eye-tracked while watching videos of other children in social settings (Peer), caregivers speaking to them (CD-Speech), and caregivers singing to them (CD-Song), along with versions of the CD-Song videos manipulated to remove predictable temporal structure. We computed spatial inter-subject correlations (ISCs) for each participant's eye position and every other participant with the same diagnosis and predicted overall video ISC by stimulus type and diagnosis. Within CD-Song, we compared ISCs between manipulated and unmanipulated stimuli to assess how rhythmic predictability influences visual attention. To examine moment-to-moment viewing dynamics within CD-Song, we computed variability in participants' eye position (dispersion) at each frame within diagnostic group, and predicted dispersion by frame-to-frame visual motion and audio volume change.

Results: ISCs (Figure 1) were highest overall in Peer videos, followed by CD-Song, with the lowest ISCs in CD-Speech (all p 's<.001). Yet while the diagnostic difference in ISC value was also largest in Peer (-0.16, p <.001; negative coefficient means lower in autism), it was smallest in CD-Song (-0.03, p <.001). ISCs did not differ between Peer and CD-Song clips for autistic toddlers. In CD-Song clips, removing temporal predictability reduced ISCs significantly more for autistic than nonautistic toddlers (-0.04, p <.001). Frame-by-frame similarity in eye location within diagnostic groups (Figure 2) was enhanced by more motion (β =-0.06, p <.001; negative coefficient means less dispersion) and reduced by larger changes in sound volume (β =0.03, p <.001).

Conclusions: Consistency in visual attention is driven by social context and time-varying stimulus characteristics including movement and sound intensity. CD-Song is highly effective at consistently scaffolding attention both within and across diagnostic groups. This consistency is driven by a combination of temporal predictability and visual motion. Autistic toddlers are particularly sensitive to temporal predictability, implying they may be relying on rhythm-based mechanisms to parse child-directed signals more than their nonautistic peers. Furthermore, researchers should consider stimulus characteristics as explanatory variables in study design, as they may reveal mechanisms driving attention in autism.



Poster Session

401 - Autism Community Issues and Experiences I

May 1st, 2025, 12:30 PM - 1:30 PM - Hall 4A

401.001 Qualitative Investigation: Client Family Perceptions of Handle® As Related to Foundational Principles

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Background: The Holistic Approach to Neurodevelopment and Learning Efficiency (HANDLE®) is an evaluation and treatment approach for individuals diagnosed with a neurodevelopmental difference such as Autism Spectrum Disorder (ASD). Following in-depth clinical observation and interview, practitioners devise a customized home program consisting of sensorimotor activities to help strengthen identified weak sensorimotor systems and to support function. Often, suggestions for lifestyle and/or environmental modification are provided as well. HANDLE home programs are reviewed and updated at regular intervals usually for a period of six months to a year. While HANDLE is based on established neuroscientific principles, it has limited representation within the literature.

Objectives: The primary objective of this research is to establish face validity of the HANDLE Approach by investigating if client experience matches interventionists' intentions as related to the foundational principles including Gentle Enhancement®, presumption of competence, holism, and neuroplasticity. The secondary objective of this research is to understand parents' lived experiences while raising a child diagnosed with ASD or another neurodevelopmental differences.

Methods: This qualitative study included 8 interviews with 6 parents of children who received HANDLE based intervention. Semi-structured interviews with a combined phenomenological and theory driven approach were conducted to learn about participants' lived experiences related to raising a child diagnosed with ASD and other neurodevelopmental differences, and specifically their experience with implementing HANDLE as an intervention. Each interview was recorded, transcribed, and coded using inductive and deductive approaches. Each interview was coded by at least two investigators and then codes were reconciled. Codes were integrated into categories and categories were developed into themes.

Results: Four themes were identified. First, *pre-HANDLE therapeutic journey* describes the parental feelings of disappointment, anxiety, guilt, isolation, and experiences with behavioral, biological, and social issues during their child's early years prior to implementing the HANDLE Approach. Second, *family/parent profile* describes shared characteristics of families who were able to fully and successfully implement HANDLE. These include being driven to seek solutions beyond status quo, having great levels of commitment, dedication, and resilience, having high levels of education, being open to change and having time and financial resources. Third, *experience with HANDLE* captures parents' reported benefits of implementing the HANDLE Approach, including how it gave them a new perspective, it enabled them to understand their child's behavior, access joy and establish stronger family bonds all while accepting their own vulnerability. This theme further describes their child's developmental improvements via the foundational principles of HANDLE. Fourth, *continuous concerns*, highlights how their children continue to struggle, specifically during transitional periods of adolescence and adulthood, and as related to lack of awareness about neurodiversity in the general community.

Conclusions: Results suggest that client experience with HANDLE reflects the practitioners' intentions, specifically as related to the foundational principles. Further, themes suggest that HANDLE provided many benefits to the children diagnosed with ASD/neurodevelopmental differences and to their families, and as such, it is a framework that rehabilitation professionals should consider implementing for this population.

401.002 Strength Building Reduces Autistic-Related Needs in Child Behavioral Health Systems: A Longitudinal and Supervised Machine Learning Approach

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Background:

Strengths among autistic individuals have been found to predict better quality of life and subjective well-being. Moreover, dimensional and neurodiversity frameworks suggest categorical classification and medical models based on a diagnosis of autism spectrum disorder (ASD) may limit supporting the needs and promoting the strengths of children with autistic-related challenges.

Objectives:

To (1) validate a person-centered approach to understanding autistic-related needs in child behavioral health systems through a supervised machine learning calculation of an autistic-related needs score (ARNS) for children with and without ASD diagnoses, and to (2) to determine whether building strengths reduces autistic-related needs over time.

Methods:

A total of 39,253 children aged 1-21 years-old served by a large midwestern child behavioral health system between 2018 and 2020 were evaluated approximately every 6-months, with 66% of children having follow-up assessments for a total of four years (figure 1). Each evaluation included an assessment for ASD diagnosis and Child Adolescent Needs and Strength (CANS) semi-structured interview. Using supervised machine learning, a dimensional ARNS was calculated as a weighted sum of actionable items from CANS core needs domains, standardized to a value between 0 and 1. Weights were determined by supervised machine learning modeling of diagnosed ASD by the CANS items at each assessment. Strengths were calculated by summing 15 items in the CANS strength domain. Strength building was defined at a given assessment as the median improvement of strength relative to the baseline strength (from -15 to +15), up to the point of said assessment. Longitudinal change was modeled in ARNS by strength building over a period of 6 to 48 months while controlling baseline strengths, demographics (age, gender, race/ethnicity), and change in ARNS over time.

Results:

Children diagnosed with ASD had greater mean number of needs (18.1, 95% CI = 17.1 ~ 19) relative to children without an ASD diagnosis (11.2, 95% CI = 11.1 ~ 11.4). Children diagnosed with ASD also had higher mean ARNS (95% CI = 0.29 ~ 0.36) relative to children without an ASD diagnosis (95% CI = 0.041 ~ 0.048). Among the full sample of children with and without ASD diagnoses, children with higher strengths at baseline had lower ARNS both at baseline (0.0030 mean reduction in ARNS per initial strength, $p < 0.0001$) and over time (0.0012 mean reduction in ARNS each year per initial strength, $p < 0.0001$); moreover, after accounting for baseline strengths, children showed lower ARNS over time based on the number of strengths built (0.0023 mean reduction in ARNS each year per strength build, $p < 0.0001$).

Conclusions:

Consistent with a neurodiversity framework, a supervised machine learning analytic approach that allowed for modeling a dimensional ARNS revealed that both initial baseline strengths, and building strengths over time, predicted a reduction in ASD-related needs over time. Taken together, results suggest focusing on building strengths among children with ASD-related needs may improve outcomes and promote resilience, indicating a need to shift towards strength-based, person-centered care and focus on practice and policy efforts that promote strength building among neurodiverse children.



401.003 "It's Made Me a Better Doctor": Resident Physicians' Experiences with an Adult Autism Training Designed with Autistic Adults and Family Members

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Background: Physicians rarely receive training in providing care for adults with disabilities, like autistic adults, in their medical education. Many physicians have low self-efficacy in meeting autistic adults' needs. We partnered with autistic adults and family members of autistic adults to develop an innovative autistic adult-focused training program for resident physicians called Promoting Residents' Excellence in Patient-centered cARE (PREPARE) for Autistic Adults. The training includes six pre-recorded presentations, six case studies with accompanying "Why is this case important?" videos, and two standardized patient encounters.

Objectives: To pilot test feasibility, acceptability, appropriateness, and effectiveness of PREPARE for Autistic Adults.

Methods: In this single-group pre-test post-test pilot study, we recruited residents from Internal Medicine, Family Medicine, and Internal Medicine and Pediatrics at one institution. The training was delivered virtually over eight weeks and consisted of six pre-recorded lectures, six facilitator-led case studies, and two standardized patient encounters. Participants completed an autism knowledge assessment before and after the training. After the training, they also completed the Feasibility of Intervention Measure (FIM), Acceptability of Intervention Measure (AIM), Intervention Appropriateness Measure (IAM) and completed qualitative interviews. Quantitative data were analyzed with descriptive statistics, and changes in autism knowledge were analyzed with Wilcoxon-signed rank tests. Qualitative interviews were analyzed using thematic analysis.

Results: Fourteen residents consented to participate and N=11 completed the post-test. Most FIM, AIM, and IAM items had a median of 5 (highest possible score) for the training as a whole and for each of the individual components, indicating strong feasibility, acceptability, and appropriateness. The median completion rate was 76.9% of all training components, indicating high completion rates. Examination of change in participants' knowledge revealed a median increase of 11.8 points (Interquartile Range: 5.9-17.6; $p=0.015$). We interviewed 11 participants.

Qualitative analysis revealed four themes. First, "flexibility facilitates feasibility" highlights how the more flexible the training is, the more feasible it is for participants to participate in. Second, "high-value experiences increase acceptability" captured how hearing from autistic adults in the "Why is this case important?" videos and standardized patient encounters is a rich experience and how the training offered participants a safe space to practice newly learned skills that required leaving their comfort zone. Third, "other practicalities affecting implementation" captured other factors that either increased or decreased feasibility, acceptability, and appropriateness, including that some topics or strategies were still unclear to participants at the end of the training and would benefit from additional clarity. Fourth, "it's made me a better doctor," highlighted that participants felt the training filled a gap in their medical education and that participants are already applying their newly learned skills in clinical practice or have thought about how they would apply them.

Conclusions: Results suggest PREPARE for Autistic adults is perceived as highly feasible, acceptable, and appropriate, can be carried out with good completion rates, and significantly improves residents' knowledge about autistic adults. Next, we will make refinements to the training and conduct a waitlist-controlled study among residents measuring self-efficacy, attitudes and beliefs, and knowledge about providing care for autistic adults.



401.004 "Like Two Wolves in My Brain:" Descriptions of AuDHD on X (Formerly Twitter)

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Background: Research suggests that 40 to 70% of Autistic people have ADHD (Hours et al., 2022; Rong et al., 2021). Traditional research has treated autism and ADHD as separate conditions. The concept of "AuDHD," a colloquial term for the overlap between autism and ADHD, has recently gained attention in online Autistic communities. Craddock (2024) describes AuDHD as "more than the sum of its parts; a thing in and of itself" just like purple is more than blue plus red. The concept of AuDHD has important implications for clinicians and researchers. X (Formerly Twitter) offers opportunities for exploring new concepts, especially from marginalized groups whose own descriptions of their experiences have tended to be limited in academic literature.

Objectives: The goal was to better understand AuDHD by exploring tweets of people who publicly identify as having it.

Methods: An advanced search of X was conducted using the phrase "AuDHD is" with dates from 10/15/2021 to 10/15/2024, resulting in 479 public tweets. Each tweet was assessed to determine whether the author identified as having AuDHD. Sometimes this was clear from the tweet (e.g., "my AuDHD") or the author's bio. If the bio only mentioned autism or ADHD, other public tweets were explored. When the author's AuDHD status could not be determined, the tweet was removed, resulting in 374 tweets. The steps of thematic analysis described by Braun & Clarke (2006, 2023) were used to explore the content of the tweets and the overall themes.

Results: Five major themes were generated: **1) AuDHD as a set of paradoxes:** (e.g., routine versus novelty, intense focus versus "going down rabbit holes," needing rules versus wanting freedom). Some described these paradoxes as "painful," but if managed properly, the combination of opposite traits was described as potentially helpful (e.g., intense focus helps with in-depth study, while novelty-seeking helps with switching tasks). **2) "The best thing that ever happened:" the importance of identification and diagnosis:** individuals described the benefits of knowing that they have AuDHD and difficulties associated with not knowing. **3) "Perpetually drowning:"** people described executive functioning problems and difficulties with activities of daily living that they related to AuDHD, as well as struggles finding the right medications. **4) "I'm home:" Community as creating and validating identity:** people discussed how other AuDHDers helped them accept themselves while they felt rejected by other groups, **5) "A Wild ride:"** individuals shared examples of how their AuDHD-related curiosity and interests gave them pleasure.

Conclusions: AuDHD is described as a unique identity, separate from ADHD and autism. Researchers and clinicians should attend to how autism and ADHD interact, rather than focusing on only one or the other. Placing an emphasis on identifying AuDHD early and helping people find community is key. Although many AuDHDers recognize the benefits of their neurotype, they also describe ways in which it can be disabling in certain contexts. Future research should include AuDHDers in exploring assessment practices and interventions, including ways to modify environments to maximize the benefits of AuDHD while helping people overcome the challenges.



401.005 "Multiple Masks Weigh Us Down": A Qualitative Exploration of Autistic Intersectional Performativity

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Background: Performativity refers to how people appear, behave, and communicate to conform with dominant societal norms. Autistic masking encompasses the conscious and implicit ways that autistic people perform as non-autistic. Autistic masking is associated with health detriments, including elevated suicide risk. Multiply marginalized autistic community members report engaging in intersectional performativity, e.g., masking their autism and “passing” as cisgender. However, studies to date have mostly focused on autistic masking in isolation, sans intersectional analyses. Researchers have yet to empirically explore autistic intersectional performativity experiences and their subjective health implications.

Objectives: To explore how autistic people experience intersectional performativity and its health impacts, via the narratives of autistic participants with multiply marginalized identities.

Methods: For this qualitative study, the principal investigator (presenting author) conducted semi-structured narrative interviews with 10 autistic participants. Interviews focused on participants’ experiences of autistic masking and gender, sexual orientation, and racial/ethnic performativity. Participants were purposefully sampled for a range of relevant multiply marginalized autistic identities (e.g., autistic and transgender). Inclusion criteria were: 1) English language fluency; 2) 18 years or older; 3) lives in the United States; and 4) formally diagnosed or self-identifies as autistic. Self-identified autistic participants were included given formal diagnostic disparities among multiply marginalized autistic populations. The principal investigator and an external autistic coder employed thematic and narrative analyses on the data. To increase rigor, they discussed and resolved all coding differences. Both further drew from and reflexively examined their insider positionalities as multiply marginalized autistic researchers.

Results: 3 major themes were identified: 1) The Intersectional Nature of Autistic Performativity; 2) The Necessity and Consequences of Autistic Intersectional Performativity; and 3) Urgent Needs for Research and Resources. Participants described their experiences of autistic masking as deeply interconnected with their gender, racial/ethnic, and sexual orientation performativity. Many recounted incidents wherein they had to engage in intersectional performativity (e.g., simultaneously masking autism, passing as cisgender, and “code-switching” as White) to avoid violence (e.g., during police encounters) resultant from overlapping oppression (e.g., ableism, transphobia, and racism). Participants reported their intersectional performativity as necessary for basic survival, but as highly draining and health detrimental. Finally, participants indicated urgent needs for increased autistic intersectional performativity research and resources tailored for multiply marginalized autistic communities.

Conclusions: Study findings initially elucidate the complex and health-impactful nature of autistic intersectional performativity. This performativity may bear both advantages (e.g., increased safety) and detriments (e.g., poorer health) for multiply marginalized autistic people. As masking by itself is associated with negative outcomes, we recommend that researchers further examine autistic intersectional performativity and its health implications. Such scholarship would help address the present dearth of autistic intersectional performativity literature and resources.

401.006 "My Brain Works Fine. It's a Great Brain. It Does a Lot of Great Things." Examining Autistic Individuals' Metacognition As It Relates to Learning in School

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Background: Educational institutions have historically been inequitable for neurodivergent students (e.g., Mueller, 2021). Schools and educators use generalized labels for students (i.e., “autism”) that activate standardized, intensive therapy, rather than individualized interventions. Few educators draw on students’ self-awareness of their own learning which has increasingly shown to be effective in predicting both emotional well-being and academic learning outcomes for neurotypical and neurodivergent individuals (Arguedas et al., 2016; Demetriou et al 2020; Roberts et al., 2016). Some argue that autistic children’s metacognition is less developed than their neurotypical peers, and thus they have less self-awareness of their own learning needs (Grainger et al., 2016); there is a need for research that combats this assertion and centers first-person autistic student perspectives.

Objectives: The purpose of this study was to understand autistic students’ metacognition and self-awareness in the school context. We will consider how these views relate to those of teachers and peers and the ways that this self-awareness relates to learning in school.

Methods: We interviewed 19 autistic adolescents and adults between the ages of 16 and 43 who reported being diagnosed by age 12.5 years, on average. Participants were invited to take part in interviews via video conferencing, audio, or asynchronous methods. Interviews were analyzed using a reflexive, thematic approach.

Results: Three themes emerged from qualitative analysis. First, autistic students have a strong, well-developed self-awareness of how they learn in the school setting. For example, one respondent noted, “I am continuously learning every day about myself. I think that it's obviously a good path for me to understand that here's what I end up wanting. Here's what I need. Here's what I need to say in order to get what I want...” Second, there is often a mismatch between the messages autistic students get from their teachers and peers and their own understanding of themselves. One respondent noted, “I was a top-performing student, but I think my teachers and staff always focused on me being quiet and awkward rather than being successful at other things.” Third, autistic students have had to develop this self-awareness or metacognition as a means of adapting and coping with an environment not built for them. Autistic students reported having to develop a keen sense of their own learning needs and preferences, including their sensory and mental health needs, and their social communication preferences because the school environment was not accommodating.

Conclusions: Findings suggest that teachers and school staff should recognize autistic students’ metacognition and empower students to share these insights with their teachers. To quote one interviewee, “even back in kindergarten and first grade, had I been asked, “Is there a way to make this easier?” I could've given them seven different ways that would've helped.” Consistent with the goal of presuming competence, educators should engage with their students in problem-solving around their needs, with the expectation that autistic students are self-reflective about their learning. Collaborating with students may engender more effective learning environments for them and their autistic peers.

401.008 "You Can't Change Certain Aspects of Who We Are": Autistic Adolescents' Perspectives and Experiences with Behavioral Interventions

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Background: Behavioral interventions (BIs) are commonly used to teach new skills to autistic children. Despite their popularity and empirical evidence, they have received considerable pushback from autistic advocates who highlight that these interventions are not neurodiversity-affirming and can cause harm due to emphasizing compliance and “normalization” (i.e., encouraging behaviors perceived as more neurotypical). While these critiques are primarily found on non-academic forums, preliminary empirical investigations with autistic adults echo such concerns. However, hearing from younger individuals who have recently or are receiving BI is also crucial.

Objectives: This study aims to elicit perspectives on common BI goals, practices, and procedures from the point of view of autistic adolescents who have participated in BI.

Methods: Ten semi-structured interviews with autistic adolescents (age 13-17) were conducted. Questions were asked about adolescents’ experiences with BI and their perspectives on intervention goals, practices, and different support strategies and components of intervention models. Interviews were recorded, transcribed, and analyzed using reflexive thematic analysis.

Results: Five themes were generated: 1) Compliance-focused intervention is triggering; 2) Quality of life goals are important; 3) Accommodations over normalization; 4) Messages of Ableism; 5) Importance of nuance and individualization. Statements related to the first theme generally related to negative experiences. One participant noted that being “forced to do something not preferred” or comply with demands was not helpful. Statements categorized into the second theme related to skills that were seen as important (e.g., communication, self-advocacy), and participants connected them to larger outcomes (e.g., making friends, independence). One participant said, “Those are good goals because they will teach you to—you know—communicate and advocate for yourself. When you become an adult, communication is extremely essential in your daily life.” The third theme related to providing individuals accommodations instead of focusing on teaching them to be more “normal.” Participants mentioned environmental modifications as positive intervention tools but advised not to aim to change the individual. The fourth theme showed up in multiple ways. Some participants indicated that goals may be necessary for the good of those around them (e.g., “Yeah, because when people have an emotion change, it can be distracting to others.”). Others noted that people should be less ableist (e.g., “You can’t change our certain interests, or how we have a strong aversion to a certain thing. And you sort of just have to accept that about someone”). Finally, most noted that goals and intervention strategies should be individualized.

Conclusions: This analysis provides valuable insight into how autistic adolescents view BI. Themes generated from these interviews could be helpful for professionals as they attempt to address issues identified by autistic individuals and create more neurodiversity-affirming support. Specifically, intervention should focus on quality of life over compliance and providing accommodations instead of emphasizing “normalization.” Additionally, given that there is considerable nuance in *when* and *how* goals should be targeted, practitioners should be sure to individualize support. Finally, it is crucial to consider potential messages of ableism that may be implied in BI and determine how to replace these with more neurodiversity-affirming messages.

401.009 First Impressions Matter: Investigating Children's Biases Toward Autistic Peers

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Background: Many autistic individuals face social challenges which may partly stem from their interaction partners, especially when biases toward autistic people are present. Research has shown that non-autistic adults and adolescents often display strong implicit and explicit biases towards autistic children and adults. These biases can surface after very brief exposure (less than 10 seconds) to autistic people and tend to persist over time. Since educational interventions have proven effective in reducing autism-related stigma, it is essential to gain a better understanding of when and how negative perceptions form in children to better address and mitigate them.

Objectives: This study investigated whether school-aged children have negative first impressions of school-aged autistic children.

Methods: Thirty-seven non-autistic children aged 5-12 years ($M=8.19$, $SD=1.98$; 15 Male, 22 Female) viewed brief (~10 seconds) videos of 10 autistic and 10 non-autistic children speaking about their hobbies. Following each video, participants rated the child’s traits (e.g., awkwardness, likeability, etc.) and their behavioral intentions towards the child (e.g., willingness to live near the stimulus child). Parents of the child raters filled out questionnaires regarding the child’s social competence (Multidimensional Social Competence Scale), and demographic information. Children’s IQ was assessed with the Wechsler Abbreviated Scale of Intelligence, 2nd Edition, Full-scale 2.

Results: Autistic children were rated less favorably overall ($F(1,36)=6.06$, $p=0.019$, $\eta_p^2=0.066$). There was also a significant interaction between video stimulus (autistic or non-autistic) and trait/behavioural intention item ($F(5,39,193.85)=2.54$, $p=0.026$, $\eta_p^2=0.144$). Specifically, autistic children tended to be rated as more awkward ($p=0.003$), more aggressive ($p=0.016$), and less likeable ($p=0.030$), but the child raters did not demonstrate less willingness to interact with the autistic children depicted in the videos. Overall autism bias was not related to age, IQ, sex, or social competence.

Conclusions: Children as young as 5 years old demonstrated negative first impressions of autistic children’s traits, regardless of the rater’s age, sex, IQ, or parent reported social competence. However, we did not find evidence of biases in behavioral intentions toward autistic children. These findings are consistent with previous research showing that autistic individuals are often perceived as more awkward and less likable than their non-autistic peers. This is concerning, as the perception of autistic children as more awkward or aggressive may contribute to their being viewed as an “outgroup,” potentially leading to increased bullying and social alienation.

The finding that negative biases emerged in children as young as 5, after only brief exposure, highlights the need for early educational interventions to improve perceptions of autistic individuals. Future research should aim to pinpoint which specific traits of autistic children contribute to these negative perceptions as they can then be targeted in educational interventions. Although these negative judgements were confined to perceptions of autistic children’s characteristics and did not influence behavioral intentions, this distinction highlights the importance of fostering both understanding and acceptance of autistic traits. By developing more effective educational tools to promote neurodiversity awareness and appreciation, we can work toward reducing the stigma surrounding autism and fostering more inclusive environments for all autistic people.

401.010 "the Best School Environment for Me": A Qualitative Exploration of Autistic Student’s Perspectives on Supporting Participation at School

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Background: Despite a significant body of research related to inclusive education, widely available resources, and the availability of professional support, current practices are not meeting the needs of autistic students or their educators to enable participation of autistic students in mainstream schools. Existing research primarily represents the perspective of non-autistic researchers, clinicians, school administrators and teachers, rather than prioritizing children's perspectives on what they would find supportive at school. Shifting approaches to capture the perspective of autistic students might be key to advance understanding of how to best support autistic students.

Objectives: This in-depth exploration of the experiences of autistic children at school aimed to: (1) explore autistic students' perceptions of what created the optimal environment to support their participation at school, and (2) prioritize autistic children's perspectives and thoughts as central to understanding their experiences.

Methods: The conceptual framework of relational ethics guided this study as we endeavored to generate data *with*, not *for*, autistic children. Within this paradigm, a collective case-study approach was used, with each case anchored by an autistic student. A variety of creative methods were used to help autistic students share their thoughts and experiences, including interviews, photo-elicitation, photovoice, beans and pots, write-draw-tell, researcher field notes, and participant observations. In each case, researchers attempted to garner experiences of successful and unsuccessful participation experiences in the school environment. Data were analyzed first within and then across cases through an iterative process of reflexive thematic analysis.

Results: Participants included four autistic students (ages 9-11 years; grades 4-6, 75% male; all co-diagnosed with ADHD; 3 with full/shared educational assistant) enrolled in mainstream education (i.e., not segregated or specialized programming beyond IEP). Each participant used spoken language, of varying sophistication, to communicate. Even though we did not use the words belonging or connection during data collection, our participants overwhelmingly emphasized that *Belonging and connection are necessary for a positive school experience*. This overarching theme anchored two themes that reinforced that the 'best school environment' was one in which students' felt that they were accepted for who they are as they are, and where they felt seen, heard and valued without judgment and experienced connection with others. Theme 1, *Autistic students deserve to feel psychologically safe at school*, reflected the importance of their relationship with their teachers, influence of bullying, and support for different ways of learning. Theme 2, *Sensory experiences at school impact my ability to engage and participate*, reflected the extent to which the physical school environments were overstimulating and benefits of having student-driven (as needed) regulating breaks in calm spaces.

Conclusions: We anticipated learning about environmental, academic and/or task adaptations that would help autistic students participate better at school. However, our data suggested that the best school environment for autistic elementary students is one in which they feel a strong sense of belonging and connection with others, including feeling both psychologically and physically safe in the sensory and social environments. Findings can be used to shift how inclusion is envisioned and enacted in schools.

401.011 A DEEP Dive into the Health Perceptions of Mothers with Autism Spectrum Disorder: A Hermeneutic Phenomenological Study

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Background: In the field of autism, the perceptions and experiences of mothers regarding their health and well-being remain less visible in the literature as compared to the children's health. These mothers are the family warriors playing multiple roles in the family while taking care of their children with autism spectrum disorder (ASD).

Objectives: This qualitative study aimed to investigate an in-depth understanding of these mothers using Ricoeur's hermeneutic phenomenology. **Methods:** The researcher interviewed fifteen participants with at least one child with ASD in person and audio-taped Zoom sessions using semi-structured questions.

Results: Two environmental themes were (a) nonsupport to support and (b) stillness to rumble. Three phenomenological themes were (a) flood of emotions, (b) self-talk, and (c) me-time. The study's findings illustrate the perceptions of mothers of children with ASD regarding their health, contributing factors, and mothers' perceived barriers or positive methods that helped them maintain good health.

Conclusions: The stories of these mothers have provided awareness of the experiences lived by these mothers and the challenges that mothers face playing multiple roles in the families while taking care of their children with ASD and managing time for self-care. The findings highlight the immediate need for community interventions to develop programs that provide support to these mothers so that they can take care of their mental and physical health. This study also emphasizes the urgency of support networks for mothers to improve their overall health outcomes.

401.012 A Mixed Methods Analysis: Autistic Adults Describe Facilitators and Barriers to Autistic Community Connectedness

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Background: Prior literature has framed the unique value and benefit of concepts such as ‘autistic infrastructure’ and ‘autistic community’ (Ryan Idriss, 2021; Bagatell 2010). Autistic people report greater comfort in socializing and easier communication with each other (Crompton et al., 2020). Autistic identity and internalized stigma have been linked to autistic community connectedness in prior literature (Botha et al., 2022). However, little is known about specific barriers and facilitators that autistic adults experience related to autistic community connectedness.

Objectives: This study used a mixed-methods approach to understand how autistic adults are involved with the autistic community and what barriers and facilitators are described in relation to autistic community connectedness. Comparisons between qualitative reports of barriers and facilitators were assessed in relation to measures of internalized stigma about autism and autistic identity.

Methods: 10 autistic adults in the United States (21-63 years, $M=36.1$; 50% cisgender women; 50% trans or non-binary, 100% white/non-Hispanic; 70% formally diagnosed) completed a brief questionnaire and a 1-hour chat-based qualitative interview. The qualitative interview involved open-ended questions eliciting information about their experiences with the autistic community. Transcripts were evaluated via thematic analysis to uncover reoccurring themes of facilitators and barriers. Code frequencies were calculated per transcript as both a total number of times a barrier or facilitator was coded (including repeated codes) and as a number of unique codes present in the transcript. The brief questionnaire included an autism specific internalized stigma scale (Botha & Frost, 2018) and the Autism Spectrum Identity Scale (ASIS positive difference/spectrum ability subscales; McDonald, 2017).

Results: Autistic adults engaged in the autistic community in a variety of ways, most frequently participants reported having autistic friends/peers (7/10), and engaging with the autistic community online (6/10) and asynchronously (i.e., books, blogs; 6/10). Participants identified several factors (facilitators) that led to becoming or staying involved in the autistic community. Most commonly they described increased self-acceptance or exploration (7/10), support with common challenges (7/10), similar social styles (5/10), and finding people with shared interests (5/10) and through another role (e.g., as a parent, teacher, therapist, researcher; 5/10). Several factors that made it difficult to initiate or sustain involvement with the autistic community (barriers) were also described by participants. Common themes included misinformation online or in autistic spaces (6/10), internalized stigma (6/10), interpersonal challenges (4/10) and masking (4/10). Exemplar quotes of facilitators and barriers are included in Table 1. Correlations between qualitative (frequency) and quantitative measures (Table 2) showed that internalized stigma was correlated with fewer facilitators ($r = -.731, p = .016$) and greater barriers ($r = .790, p = .007$) identified during qualitative interviewing. More positive autistic identity correlated with greater identification of facilitators, but not barriers, during interviewing ($r = .652, p = .041$). Correlations were non-significant between internalized stigma and autistic identity.

Conclusions: Participants described a range of experiences relative to autistic community involvement. Descriptions of facilitators and barriers may inform future work supporting community connectedness. Internalized stigma and autistic identity may be important to consider related to supporting autistic community connectedness.



401.013 Fostering Self-Advocacy: Parent Perceptions of the Impact of This Is Me (TiME) for Transition-Aged Students with Autism and Other Intellectual/Developmental Disabilities

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Background: Self-advocacy is a critical skill for transition-aged students with autism and/or intellectual and developmental disabilities (I/DD) – especially those with co-occurring communication challenges – as they prepare to navigate new environments in post-secondary education, vocational, and community settings. Fostering self-advocacy in this population leads to greater independence, increased engagement in decision-making, and improved long-term outcomes, including higher rates of employment. This is Me (TiME) is a customized, electronic transition tool developed by speech-language pathologists to mitigate losses of key information during transitions, and to assist students to more independently communicate their strengths, needs, and preferences across postsecondary settings. This strengths-based tool encourages direct student participation to the greatest extent possible. The present study addresses a gap in the literature by focusing on parent perspectives on the impact of TiME, building on prior research which demonstrates that TiME assists novel adults in understanding students' support strategies.

Objectives: To 1) identify parent/caregiver perspectives on TiME's impact on students, and 2) determine whether parents who mentioned self-advocacy as a key benefit of the tool were more likely to indicate intent to share the tool broadly as part of students' transition processes.

Methods: Researchers conducted a thematic analysis of interviews with 26 parents/caregivers of students with I/DD and/or autism (ages 15-22 years; 10:16 Female:Male; 11 White, 10 Black/African American, 3 Asian, 1 Multiple Races, 1 Hispanic/Latino(a)), attending non-public special education school. Thematic analysis of transcripts was based on methods described by Clarke & Braun (2021): 1) Lead authors engaged in data reduction by independently reviewing the data corpus and labeling statements that pertained to the primary research questions. 2) Authors met regularly to organize quotes and generate themes. Differing opinions were resolved via consensus. 3) After finalizing the coding system, lead authors revisited all transcripts to formally code them using the agreed-upon codes and made modifications as necessary. 4) The entire research team met to discuss the coding system, themes, and subthemes. 5) Lead authors concluded the analysis by identifying quotes that best represented each theme/subtheme. Social validity interviews were also conducted with 15 students who were able to provide meaningful feedback on the tool.

Results: Key themes identified indicate that parents/caregivers perceived TiME to: 1) support students' interactions with novel adults by reducing the burden of communication, 2) facilitate students' autonomy and independence, 3) personalize and humanize students, and 4) increase students' self-confidence and self-awareness. Preliminary analysis further suggests that parents who valued the self-advocacy of TiME were also likely to mention their intent to have students share TiME with potential employers, adult service providers, and/or other novel adults involved in students' post-school transition process.

Conclusions: This study enhances and supports prior literature by capturing parents/caregivers' perspectives on TiME's impact. Both parents and students were nearly unanimous in their enthusiasm for the tool's potential to promote self-advocacy and communicate key information about support needs and strategies using a strengths-based approach. Responses to TiME showcase the potential for assistive technologies to promote self-advocacy and more seamless transition.



401.014 A Quantitative Analysis of Clinician Evaluation Results Following Training on the Safety Planning Intervention Tailored for Autistic Individuals

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Background: A growing body of research dedicated to suicide risk screening, assessment, and interventions adapted for autistic people fills a critical knowledge gap to prevent premature death in this high-risk population. This is responsive to the autistic community's priorities for mental health research and practice (Benevides et al., 2020). Yet, clinicians have reported that the Safety Planning Intervention, effective for non-autistic people, feels less acceptable for use with their autistic clients (Jager-Hyman et al., 2020). Aligned with recommended adaptations (Schwartzman et al., 2021), the Safety Planning Intervention Tailored for Autistic Individuals (SPI-A) is designed to leverage autistic clients' strengths and preferences. To deliver the SPI-A, clinicians attend a training co-developed and co-led by autistic people, including those with lived experience of suicidality. Clinicians must then pass a competency evaluation consisting of open-ended questions about roleplay videos of a therapist and autistic client creating an SPI-A together.

Objectives: The present study measures the success of the SPI-A training by analyzing clinician pass rates for the evaluation.

Methods: The evaluation included a total of 11 questions, with the first eight questions scored separately from the last three. Questions assessed clinician knowledge of communication strategies for use with autistic clients (e.g., "What change could the clinician make to improve communication with Kai?") and application of SPI-A core components and considerations to increase the chances a client will use their safety plan (e.g., "Once Kai's safety plan is complete, what are three things Dr. Smith can do to maximize the likelihood that Kai will use their safety plan when needed?"). Team members independently scored deidentified responses using a standardized rubric that awarded up to two or three points, depending on the question, based on the inclusion of key words, phrases, and concepts specific to each question. A consensus scorer resolved any discrepancies.

Results: 277 clinicians that see autistic clients in neurodevelopmental diagnostic, outpatient mental health, primary care, and medical specialty clinics in four United States healthcare systems completed the evaluation. To pass, clinicians had to score at least 13 out of 16 points on Part 1 and at least 6 out of 7 points on Part 2. About 84% of clinicians passed on their first attempt ($n = 233$). On average, clinicians scored 14.01 points ($SD = 2.03$), or 88% ($SD = 12.70$), on Part 1 and 6.38 points ($SD = 0.88$), or 91% ($SD = 12.50$), on Part 2. The pass rate for Part 1 was 85.6%, slightly lower than the 89.2% pass rate for Part 2.

Conclusions: The results suggest that most clinicians successfully integrated the strategies for communication with autistic clients with the steps to create an SPI-A that the client is likely to use. This is a core tenet of the training – the importance of the clinician and client collaborating to ensure the safety plan is relevant and useful when clients are in crisis. In combination with prior analyses demonstrating improved clinician attitudes, self-efficacy, and knowledge from pre- to post- SPI-A training, this is suggestive of the training's success.

401.015 A Strength-Based Review of Current Autism Research

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Background: The neurodiversity movement has led to a shift in how autism is understood, emphasizing differences as unique strengths rather than deficits (Bottema-Beutel et al., 2021). Despite increased societal acceptance, autism research often continues to describe autistic individuals from a deficit-based perspective. This review aims to assess the extent to which contemporary research aligns with a strength-based approach, focusing on the representation of autistic individuals, the terminology used for comparison groups, and the relevance of research findings to autistic people's quality of life (Happé & Frith, 2020).

Objectives: This review aims to evaluate how current autism research integrates a strength-based perspective by examining the descriptions of autism, the labels used for comparison groups, and how findings are discussed in relation to autistic individuals' quality of life. It also seeks to determine how often researchers focus on individual strengths, motivational styles, and differences relevant to the daily lives of autistic individuals.

Methods: A scoping review framework guided by the JBI Scoping Review template was used to conduct this study. A systematic search of articles published in 2023 was conducted using articles published in the Autism Research Journal Issue of 2023 (16). Studies were included if they were empirical, published in peer-reviewed journals, and focused on participants with an autism diagnosis. Each article was rated on three dimensions: Life Improvement, Comparison Group Description, and Pathologizing Autism, using a 0-1 scale, with 1 aligning with strength-based approaches and 0 meaning the absence of strengths approaches/leaning towards deficit. Rayyan software was used for data management.

Results: Preliminary findings from eight studies indicate limited adoption of a strength-based perspective in autism research. The average scores were as follows: Life Improvement ($M = 0.22$, $SD = 0.41$), Comparison Group Description ($M = 0.66$, $SD = 0.38$), and Pathologizing Autism ($M = 0.31$, $SD = 0.44$). These results show that while most research is shifting towards a strength-based perspective, implementing specific necessities that make up strength-based research, such as how research can impact the quality of life of autistic individuals, needs to be improved.

Conclusions: The findings underscore the need for a paradigm shift in autism research towards a more strength-based approach. While some studies show progress in using respectful terminology and focusing on the quality of life, many still rely on deficit-based frameworks. Future research should prioritize interventions that aim to improve life satisfaction for autistic individuals and use language that reflects autism as a difference, not a deficit.

401.016 A Survey on Sensitive Language Use in the Autism Community in Singapore

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Background: The language we use in describing autism has an integral role in shaping its social perception and understanding. International literature, primarily from western countries, has illustrated diverse preferences for language including that for identity-first language (IFL) (e.g. autistic person) versus person-first language (PFL) (e.g. person with autism). The ongoing debate between PFL and IFL is shaped by cultural, medical, and advocacy perspectives. While PFL continues to be widely used in formal settings, there is a discernible shift toward IFL, particularly among autistic individuals and advocacy groups who view autism as an integral part of their identity rather than a condition. Singapore is a developed small city-island nation located in Southeast Asia with a multicultural population of 6.03 million people. The ethnic composition of Singapore residents comprises 74.2% Chinese, 13.7% Malays, 8.9% Indians, and 3.2% Others. English is the official language used in schools and at the workplace. Given the country's multicultural background and Asian cultural setting, coupled with English fluency, we postulated that there would be a preference for PFL among caregivers and medical professionals and an IFL preference among autistic individuals. **Objectives:** The primary aim of this study was to understand preferences regarding language use within the autism community in Singapore. **Methods:** An anonymous online survey was sent out to adults on the autism spectrum, their caregivers, and professionals working in the field of autism. The survey comprised questions related to terms to describe autism, its symptoms, and areas of need. Respondents were asked to rate each term/phrase from 1 (uncomfortable/I do not like this term) to 7 (very comfortable/this would be my preference). **Results:** 229 individuals answered the survey (185 (80.7%) females, ethnic distribution reflective of national distribution). Respondent types comprised 29 (12.7%) autistic individuals (AI), 63 (27.5%) caregivers/relatives (CR), and 137 (59.8%) professionals (P). Examples of preferred terms (mean $\pm$ SD Likert score) when describing autism included autism rather than autism spectrum condition/disorder (5.82 $\pm$ 1.51 vs 3.96 $\pm$ 2.02, $p<0.001$), special interests rather than obsessions (5.54 $\pm$ 1.67 vs 3.01 $\pm$ 1.99, $p<0.001$), and challenging behaviours rather than problem behaviours (4.45 $\pm$ 1.91 vs 2.63 $\pm$ 1.77, $p<0.001$). There were multiple significant differences in language preferences between respondent types (AI, CR or P), but much less so between respondent gender, ethnic group, or age group. For example, AI did not prefer 'symptoms' of autism, or 'person with autism/ASD', whereas CR/P rated them much higher. **Conclusions:** While some language preferences in the Singapore population appear similar to those in Western populations, we need to be particularly cognizant of and sensitive to varying preferences between those with lived experience versus professionals. Improved use of terminology by considering cultural and demographic factors can facilitate better inclusion and acceptance of neurodiversity. Future research can deepen our understanding of the impact of language on identity, inclusion, and mental health in the autism community. Broadening the scope of respondents to include more children, non-verbal/speaking autistic individuals, and those from diverse racial, ethnic, and socio-economic backgrounds which are often underrepresented is critical in fully understanding the implications of language use.

401.017 A Synthesis of Caregiver-Implemented Ndbis for Culturally and Linguistically Diverse Children on Autism Spectrum
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Background: Caregiver-implemented Naturalistic Developmental Behavioral Interventions (NDBIs) have proven effective in enhancing social communication skills in autistic children. However, the majority of research focuses on English-speaking, moderate-high income, and white caregivers, highlighting the need to address cultural and linguistic diversity in these interventions. **Objectives:** The purpose of this synthesis is to examine the effectiveness of caregiver-implemented NDBIs (CI-NDBIs) for autistic children from various cultural and linguistic backgrounds. To understand NDBI implementation by caregivers of autistic children, this synthesis aims to address the following research questions. **Research Question 1:** Are culturally adapted CI-NDBIs effective for improving caregiver implementation of core strategies? **Research Question 2:** What cultural adaptations have been implemented to address the needs of families from diverse cultural and linguistic backgrounds, and do these align with the recommendations for culturally adapting interventions? **Methods:** A systematic literature search was conducted that included several methods. First, an electronic database search was conducted using the following four databases: Education Source, ERIC, MEDLINE, and PsycINFO. The cultural adaptation checklist was derived from Lee et al. (2023) to examine seven domains: language, persons, content, goals, methods, context, and process to see whether the studies met the cultural needs of participants from diverse cultural and linguistic backgrounds. **Results:** The synthesis includes 10 studies from six countries, showing that these interventions improve autistic children's social engagement and communication, reduce parental stress, and enhance intervention fidelity and validity. **Conclusions:** While efforts have been made to study culturally adapted interventions for autistic children, much progress is still needed. The findings highlighted the importance of further research on cultural adaptations to improve the effectiveness of NDBIs for diverse populations. Specifically, the discussion emphasized the need for developing diverse assessment tools and integrating NDBI skills into daily routines, rather than focusing solely on play-based activities. Future research on caregiver-implemented NDBIs should prioritize cultural adaptations that consider the linguistic, contextual, and cultural backgrounds of participants, with an emphasis on collaboration with community partners. Moreover, comparing culturally adapted interventions with traditional implementations is essential for identifying the specific elements of cultural adaptations that contribute to more significant outcomes.

401.018 A Systematic Review of Psychosocial Interventions to Reduce Parenting Stress and Strain Among Caregivers of Autistic Children
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Background: Parents of autistic children experience high levels of parenting stress, which has a maladaptive transactional relationship with child emotional and behavioral problems. Most autism-specific interventions focus on modifying child behaviors, with parenting stress included as a secondary outcome, if at all. Previous research on interventions to specifically reduce parenting stress is mixed, and wide heterogeneity in study design and intervention modalities makes it difficult to parse apart which elements of interventions are effective at reducing parental stress.

Objectives: The aims of the review were to: a) examine the specific intervention ingredients that have been utilized in interventions aimed at reducing parenting stress/strain, and b) determine the efficacy of parent-focused interventions in reducing parenting stress/strain and discuss factors that may impact the efficacy of interventions.

Methods: A thorough database search of empirical articles evaluating parent-focused interventions designed to reduce parenting stress or strain among parents of autistic children was conducted. Inclusion criteria included a) publication in a peer-reviewed scientific journal, b) an intervention was implemented and tested, c) participants were parents of autistic children up through age 18, and d) parent stress/strain/burden was a primary outcome and was evaluated using a validated measure during the pretest and posttest timepoints (at minimum). Studies that included direct therapeutic involvement with the child by a professional and studies that had parent variables as a secondary outcome were excluded. Articles that met the inclusion criteria were reviewed and relevant data was extracted. Data extracted included demographics, study design, session format (in-person/virtual/hybrid), intervention modality (group/individual/mix), length of sessions and overall intervention duration, intervention components, measures used, analytic plan, and results.

Results: The search yielded 37 articles which met inclusion criteria and were included in the review. The interventions varied widely in terms of format, study design, and the therapeutic elements included. Group-based interventions were most common (19), followed by individual (13) and interventions with a mix of group and individual sessions (5). The most commonly used therapeutic element was psychoeducation (used in 21 interventions), followed by behavior management strategies (16), cognitive/coping strategies (15), relaxation/mindfulness/stress reduction techniques (14) and support/discussion with other parents (14). Thirty-one of the 37 interventions reported at least a partially significant reduction in parent stress/strain. Study settings were diverse, with 16 countries represented.

Conclusions: Due to heterogeneity in study settings, it is difficult to draw broad conclusions about the effectiveness of specific intervention components. The pattern of results suggests a potential hierarchy of needs based on the existing resources, where parents are in their journey, and areas of need in the community in which the intervention is implemented. For example, psychoeducation and social support may be more impactful for parents from low-resource areas or parents of newly diagnosed children, whereas cognitive/coping strategies or relaxation/mindfulness training may be more appropriate for parents who have already had those more basic needs met. Researchers and clinicians providing interventions should consider the culture and needs of the community of interest and work with parents to determine whether an offered intervention will fit with their unique needs.

401.019 A Vignette Based Study of the Effect of Dehumanizing Autism Research on Neurotypical Peoples Attitudes Towards Autistic People

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Background: Dehumanization can involve a denial of human unique traits (those which separate us from robots) and human nature traits (those which are said to separate us from other non-human animals) (Haslam, 2006), infrahumanization (the denial of more complex emotional states (Leyens, 2002)), or overt dehumanization whereby a group of people are considered literally less evolved (Kteily, et al 2017).

Autism research has been said to be dehumanizing (Botha, 2021; Gernsbacher, 2007; Rose, 2020), and previous mixed-method research showed that autism researchers have a propensity towards dehumanizing autistic people, in particular denying agency, subjectivity, action, and complex emotion. Non-autistic adults have been shown a propensity towards denying autistic people human unique traits, thus displaying an animalistic dehumanization of autistic people. Little research to date, has focus on research as a potential source of this dehumanization which helps to form or sustain these negative attitudes.

Objectives: Considering this, the aim of this research was to identify whether dehumanizing rhetoric in autism research influences the attitudes of non-autistic adults towards autistic people.

Methods: Vignettes were created based on peer-reviewed autism research, with a particular aim towards creating a vignette based on dehumanizing autism research, and a vignette based on more humanizing peer-reviewed research and administered to 149 neurotypical people in the US and the UK, who were 18+ with participants recruited through prolific. Participants were paid roughly £9 an hour. Any mentions of autistic people or autism were redacted from the vignettes to prevent triggering pre-existing biases. These vignettes were administered in a repeated measures design, and participants were asked to rate measures of human uniqueness, human nature, infrahumanization, and overt dehumanization. We included a manipulation check to identify if anyone could identify the group. The study was pre-registered. The study was piloted with 10 participants to ensure the vignettes were interpretable.

Results: The targets in the dehumanizing vignette were rated as having lower human nature traits ($t(148) = -4.02, p < .001$), lower human unique traits ($t(148) = -1.92, p < .02$), lower down the ascent of human scale demonstrating overt dehumanization ($t(140) = -13.3, p < .001$), lower complex secondary emotion capability compared to both primary emotion capability ($t(148) = 6.10, < .001$), and the secondary emotion capability of the humanizing vignette ($t(148) = -9.35, p < .001$) – an effect that was not seen in the humanizing vignette for differences between primary and secondary emotions ($t(148) = .178, p > .05$). Most participants did not guess who the vignettes were about, but content analysis of the manipulation control check further illustrates the dehumanization, with participants wondering whether the information in the dehumanizing vignette was “even human”.

Conclusions: These results point towards there been a potential translation dehumanization from research to public attitudes. Future research should replicate the study newspaper mention of autism research which tend to be the translation tool between the academy and the public.

401.020 Achieving Competitive Integrated Employment through Industry-Aligned Robot Operator Training and Certification for Adults with ASD Receiving Lanterman Act Services in California

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Background: Successfully deploying robots in automation and advanced manufacturing is critical for the U.S. economy, yet it experiences a shortage of skilled workers. Individuals with ASD have not been sufficiently employed in robotics despite possessing skills such as attention to detail and tolerance of repetition.

Objectives: A 6-week industry-aligned training program was developed and pilot-tested at a community college to prepare fourteen (14) adults with ASD ages 18 to 40 years old who had a high school diploma or a GED certificate for entry level robot operator jobs.

Methods: North Los Angeles County Regional Center facilitated outreach and recruitment, and provided employment support to the participating Lanterman Act services-eligible adults with ASD. Based upon the Uniquely Abled Project's model (<https://uniquelyabledproject.org>), a technical training program for adults with ASD was developed and carried out at College of the Canyons (COC), a community college in north Los Angeles County. The training consisted of the robotics curriculum in two modes of presentation, standard and in 'plain language'. A comprehensive industry-aligned robotics curriculum combined the Tooling U / Society of Manufacturing Engineers (SME) and Universal Robots (UR) content and provided an entry-level foundation for jobs in automation and advanced manufacturing. A soft-skills training and professional preparation component taught by an employment services agency was also part of the program. Prior to the full implementation at COC, elements of the curriculum were piloted with five participants with ASD who learned to carry out increasingly complex hands-on programming tasks with a UR10e robotic arm. Family support groups were held twice during the training to share family members' experiences and discuss strategies to support the trainees.

Results: All 14 trainees completed the program and 13 (93%) achieved industry-standard certification in Tooling U / SME and UR content and hands-on skills. Despite securing certifications, 5 trainees who sought employment and job placement services post-program did not secure employment due to geographic distance from available jobs and limited number of local companies offering entry-level robot operator jobs. Nine remaining trainees chose to participate in an additional 12-week training course in computer numerical control (CNC) machining. Of these, 7 (78%) secured a position: 5 were hired in full-time entry-level jobs and 2 gained an apprenticeship placement anticipated to lead to permanent employment. Post-program, the trainees who secured employment or apprenticeships developed new friendships and gained confidence in their abilities, leading to an improved quality of life.

Conclusions: Adults with ASD have significant capabilities to learn and be certified in comprehensive industry-standard knowledge base in robotics, with 13 out 14 trainees completing the program with Tooling U / SME and UR certifications. Having completed the fast-track robot operator training and additional CNC machining training, 7 (50%) trainees gained full-time employment or apprenticeship positions in advanced manufacturing. The employed trainees developed social skills that resulted in friendships and increased social confidence. Adults with ASD have demonstrated a significant potential for competitive integrated employment in automation and advanced manufacturing. Industry collaboration is needed to increase access to high-wage jobs for adults with ASD.

401.021 Adaptation and Piloting the Caregiver Skills Training (CST) Program in Western Province, Sri Lanka

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Background:

The World Health Organization launched the WHO Caregiver Skills Training (WHO CST) program, designed for caregivers of children aged 2 to 9 years. Initially developed in English, the CST includes evidence-based interventions to support both children's behavior and caregiver skills. The CST needed to be translated and adapted to local languages for implementation during the NAMASTE project in Sri Lanka (www.namastesl.com), and we developed a Sri Lanka-specific CST package based on this requirement. The adaptation goals are to ensure the program content is understandable, culturally acceptable, and relevant to regional participants.

Objectives:

To describe the process of adaptation and piloting to assess the feasibility of the CST program in Western Province, Sri Lanka

Methods:

Adaptation and piloting were done as an iterative process: the adaptation process began with the translation of CST materials by a panel of experts in both language and technical aspects, followed by a review by a Translation Committee. The translated documents were used in focus group discussions carried out with the participation of 12 caregivers of children with developmental delays and 45 healthcare professionals involved in the care of children with autism and Neurodevelopmental conditions (NDDs). The participant guides were modified based on input from caregivers, while facilitator and home visit guides were adapted using feedback from the healthcare professionals. The developed guides were piloted in a group including 10 caregivers, 2 facilitators, and 2 observers. The guides were finalized using data from the focus group discussions, the pilot phase, and the observer notes from the CST master trainer and special facilitators. We used deductive thematic analysis based on the Bernal theoretical framework (Bernal et al., 1995).

Results:

Feedback from caregivers and other stakeholders highlighted the need for several enhancements such as the lack of appropriate Sinhala words for certain English words (ex: feedback) and some symbols being unfamiliar in the Sri Lankan context (ex: a teacher would usually be shown wearing a sari in Sri Lanka). Pilot results indicated that participants found the CST program acceptable and relevant to their needs. However, they suggested specific improvements, including shortening the duration of group sessions, increasing the frequency of home visits, and incorporating more practical sessions. Caregivers noted that the delivery of the CST pre-pilot was satisfactory, but stressed the importance of selecting a specialized trainer for CST delivery—preferably someone with maturity and knowledge about children.

Conclusions:

The findings of this study suggest that the CST program in lower- and middle-income countries should be expanded and subjected to additional evaluation in realistic community environments.

401.022 Adapting the City to the Specific Sensory Needs of Autistic People: A Participatory Research Approach

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Background:

Cities are spaces in which our senses are particularly engaged: vehicle noise, light reflections on glass surfaces, illuminated signs, food odors and more.... For people with atypical neurological or sensory functioning, such as autistic individuals, the intense sensory stimulation present in urban environments can make cities overwhelming, limiting their autonomy and quality of life.

Objectives:

The aim of this study is to identify the micro-designs of public space that are favorable and unfavorable to people with autism, based on their experiential knowledge.

Methods:

During the initial phase, this participatory project was designed by a consortium of researchers, autistic people, clinicians, and local authority representatives, all of whom were involved in decision-making throughout the project's stages. After receiving ethical approval, the first stage consisted of semi-structured interviews conducted with 20 autistic adults and 20 professionals who work with them on a daily basis (e.g., specialized educators, psychologists). Participants were asked to express their experience of the city, based on photographs of the urban environment (streets, crosswalks, benches). In the second stage, five design thinking workshops were held with local authority staff (road planning, accessibility), organizations, and autistic people, to present the results and foster the collaborative development of solutions, using the various expertise, to make the city more accessible.

Results:

Overall, urban designs of cities are often a significant source of fatigue, physical discomfort or pain, anxiety, and even distress for autistic people. However, micro-designs modifications in public spaces can improve their experience autonomy. Findings showed that sidewalks should be sufficiently wide, with clear traffic-flow rules and indicators, visually-defined boundaries with the roadway, shaded, and not cluttered on the ground. Crosswalks should follow a standardized structure to facilitate identification and use. Vehicles and bicycles' speeds should be reduced. Finally, the incorporation of quiet areas, plants, or water features (fountains, streams) can improve the urban experience for autistic people. The presence of dogs was also identified as an area of interest for some autistic people and warrants further exploration.

Conclusions:

Reducing sensory stimuli to those useful for interaction with urban environments can help limit sensory overload. Physically structuring public spaces to account for visual function deficits and vestibular particularities, along with the creation of recuperation areas through increased natural elements, and clearly defined public space usage rules would improve the autonomy of autistic people. Only a participatory approach involving the voices of autistic people and professionals can gather this type of information, which comes under the heading of user expertise. Future perspectives include testing the effect of these micro-adaptations on the behavior and well-being of autistic people during their regular walk but also better characterizing the neurovisual and vestibular disorders that have an impact on the urban experience of autistic people.

Cities are rich in stimuli that are often poorly adapted to the atypical functioning of autistic people. However, simple solutions can be implemented to enhance walkability, autonomy and overall well-being for neurodivergent individuals in urban environments

401.023 Addressing Latino Disparities in Autism Via Culturally Responsive Support Groups

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Background: Persistent racial and ethnic disparities in obtaining an autism spectrum disorder (ASD) diagnosis and services have been documented for Spanish Speaking (SS) Latino children and other racial/ethnic minorities (Luelmo, Kasari, & Fiesta Educativa Inc., 2021). SS Latino children with ASD from Spanish-speaking homes face a myriad of unique challenges and inequities in education and healthcare. For example, when SS Latino children are diagnosed, they are more likely to have co-occurring intellectual disability. Following diagnosis, SS Latino children and their parents receive fewer evidence-based treatments and less medical specialty care than non-Latino White counterparts (Zuckerman, 2020). The goal of this abstract is to describe the outcomes of a research project that developed and evaluated autism support groups for SS Latino parents of autistic children when delivered by culturally and linguistically responsive facilitators.

Objectives: 1) Examine feasibility and acceptability of SS facilitator led autism support groups 2) Identify parental benefits and perceived barriers of autism support groups 3) Understand parents' experiences in participating in autism support groups via exit interviews

Methods: 13 SS Latino parents of children with ASD (ages 2-19) were recruited from two ongoing Spanish-language autism support groups. Families participated in virtual support groups facilitated by a SS Latina speech-language pathologist and SS Latina parent facilitator. One support group met weekly for 60-minute sessions over the span of 2 ½ months (10 sessions). A second support group met once a month for 60-minute sessions, for a total of 10 months (10 sessions). Both groups provided parents with education on autism basics, service navigation, developing routines, sleep, bilingualism, and self-care. Parents completed empowerment and social support measures at pre and post time points with the option of completing an exit interview regarding their experiences in the support group. Paired samples t-tests were used to evaluate changes in parents' self-efficacy and social support during group participation. Exit interviews were transcribed and coded by bilingual speakers using thematic analysis.

Results: Parents reported high satisfaction with the virtual caregiver groups (M=94.6%). Additionally, parents indicated significantly higher self-efficacy supporting their child after participation in group (p=0.08). Qualitatively, participants noted that the presence of a SS Latina facilitator and other SS Latino parents was important and fostered cultural identity and support. Parents revealed that having sessions in Spanish facilitated their learning and connection to other parents. Despite having children with different needs, parents found shared experiences helpful in anticipating future challenges, navigating institutional systems, and advocating for appropriate autism related services.

Conclusions: This study highlights the need to address disparities in autism care for SS Latino families by developing culturally responsive autism support groups. Findings following exit interviews and post study measures revealed parental increased knowledge regarding ASD service navigation and accessibility. Additionally, parents reported high satisfaction with virtual Spanish led groups and emphasized the need for more accessible and culturally responsive care in other settings and across the autism lifespan.

401.025 All Stakeholders Engaged in Research Together (ASSERT): Envisioning Future Research

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Background: Too often in the autism and intellectual and/or developmental disabilities (IDD) community is research being done for them, but without them. This is particularly more common for those with higher support needs. Recently, a paradigm shift has begun to occur that calls for the intentional and equitable engagement of all stakeholders to be involved in research. However, tailored approaches are needed to ensure equitable engagement and collaboration among different stakeholders, most importantly individuals themselves in the autism and/or IDD community.

Objectives: The objective of this study was to build capacity within the autism and more broadly IDD community to foster engagement and knowledge on patient-centered outcomes research (PCOR) and develop future research responsive to the needs of a diverse community.

Methods: Stakeholders (n=52), including autistic adults, individuals with IDD not on the spectrum (e.g. Trisomy 21, Spina Bifida, Tourette Syndrome), clinicians, caregivers, and researchers, engaged in an online bidirectional learning community (All StakeholderS Engaged in Research Together/ASSERT) twice monthly for six months through the Project Extension for Community Healthcare Outcomes (Project ECHO) model. Sessions lasted 90 minutes and included: Introductions, Topic overview, Small group breakout sessions, Larger group share, and Lightbulb moments. Anonymous baseline surveys were completed by all participants (n=52) to determine previous experiences in research and the extent to which they felt valued, heard, and trusted in the research process. Following each of the twelve sessions, participants completed an anonymous survey to assess changes over time. Pre/post results were matched on an individual and stakeholder level. A regional advisory board (n=15) consisting of autistic and/or IDD individuals, as well as other stakeholders met quarterly to provide oversight to the project. Participants were recruited using snowball sampling through national networks.

Results: Results of the twelve pre- and post-session surveys were analyzed using R statistical software. Due to the non-parametric nature of Likert scale surveys and the relatively small sample, a Wilcoxon signed-rank test with continuity correction was employed to assess overall significance of pre/post session survey responses based on paired observations. Further Wilcoxon tests were conducted to compare significance between groups (researchers or non-researchers). Significance was observed (< .05) for each of the questions from pre/post session surveys. Pre-session results showed "slight confidence" and "very little confidence", whereas participants after undergoing the ASSERT online community shifted towards "very confident" and "highly confident" responses. Survey constructs targeted concepts such as "understanding informed consent", "identifying types of research", "knowing ways to share (disseminate) research", "Understanding what patient-centered means", and "co-creating research together", among others. Other survey metrics showed stakeholders felt heard (99.4%, N=329), valued (99.4%, N=329), and meaningfully engaged (96%, N=329).

Conclusions: Outcomes of this project included enhanced capacity building among autistic and IDD individuals and other stakeholders through multidirectional learning using an ECHO model. As a result, all individuals expanded knowledge and awareness of ways to build inclusive research that can position our team of patients and stakeholders towards future research to improve outcomes for autistic and IDD individuals.

401.026 An Example of Co- Developing Tools to Support Neurodivergent Needs and Promote Person- Centred Approaches in Autism Research: The Intellectual Disabilities and Autism Working Group

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Background:

Only 6% of UK research participants have an Intellectual Disability (ID), despite 9 in 10 autistic people and their families expressing they want to take part in research (Autistica. (2020); Autistica, n.d.). Participating in research can be a frightening experience for neurodivergent people with different communication and sensory needs that are not well accommodated for by traditional research practices. Therefore, more should be done to cater for these specific needs of neurodivergent participants in research settings, thus addressing current gaps in representation. We have established a participatory working group (WG) known as the ID & autism WG (IDA WG), which brings together stakeholders and researchers with the goal of co-producing tools to better support neurodivergent needs in research.

Objectives:

To address communication barriers that may prevent research engagement, we have co-developed a Research Passport specifically targeted at autistic persons with ID. The objective of the Passport is to allow the participant to communicate his/her needs and preferences prior to their research visit. Researchers can then effectively plan the visit as well as engage in open supportive discussions with the family, caretakers or participant around comfort and involvement. Implementation of the Passport in research settings moves us towards a more person-centred research approach for people with complex support needs. In this way, their needs are prioritised to enhance engagement and promote superior data quality.

Methods:

An initial version of the Research Passport was co-created by a sub-group of members from the IDA WG, combining aspects of existing available resources in autism and ID respectively (Ashworth et al. 2020, Kidney & McDonald, 2014). We then shared a draft version with the wider IDA WG for feedback on content and structure before a beta version was ready for piloting with research participants. The beta version of the Research Passport was subsequently translated into Spanish for use by colleagues in Madrid. Autism representatives were included in every stage of the design and piloting of the passport, ensuring this project was co-produced from start to finish.

Results:

The Research Passport is currently being piloted within studies at King's College London and The Instituto de Investigación Sanitaria Gregorio Marañón, Madrid. Researchers are collating open-ended feedback from participants and families/caretakers on the content, structure, utility, and perceived helpfulness of the Passport. Anecdotal feedback from researchers on the same aspects are also being recorded. Over the next few months, we hope to collate this information to further refine the tool.

Conclusions:

Our Research Passport for persons with autism and ID is currently available online as a printable document for researchers or allied professionals. Tools such as this, can provide valuable support not only for participants and their families/caretakers, but also for researchers who want to accommodate a more diverse range of needs in their research studies. We hope that by designing and distributing tools such as the Passport, we can promote a more person-centred approach to conducting research that enables those with complex support needs to be better represented in research settings.

401.027 An Exploratory Study of Inclusive Practices within the Scottish Police Force

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Background: It is not uncommon for an autistic person to come into contact with the criminal justice system (CJS), either as a victim (eg Lindblad & Lainpelto, 2011) or a suspect (Woodbury-Smith & Dein, 2014). Therefore it is necessary that the Police have relevant training, knowledge and awareness of autism and the associated behaviours to allow for inclusive practices and work under an appropriate neurodivergent framework. There is a dearth of research about the interactions which Scottish police currently have with autistic people, and international findings cannot be generalised to police forces with different training and organisation (Gibbs & Haas, 2020; Slokan, 2019).

Objectives: The present study builds on the survey method used by Crane et al. (2016) within the Scottish policing service. Additionally, it elevates the autistic voice in the production of knowledge by appreciating the experience of both autistic people and police officers (Bagatell, 2010; Milton, 2014a).

Methods: Three online surveys (one for police, one for autistic adults, and one for caregivers) were produced to elicit data about experiences of autism and policing. Most questions had forced multiple-choice options but open-ended text boxes were included throughout for participants to elaborate on their responses. The content of the surveys was similar, but questions differed where appropriate to match the participant group (e.g. only autism community members had to confirm their clinical diagnosis and only police were asked for their perspectives on training needs). The surveys probed the following topics: (1) Demographic Information, (2) Nature of Police/ Autistic Encounters, (3) Autism Diagnosis Disclosure, (4) Meeting Autistic Individuals' Needs.

Results: 44% of officers found that meeting the communication needs of autistic individuals difficult when conducting interviews, with little knowledge of aspects such as sensory difficulties. Overall, only 35 % of officers were satisfied with how they had worked with autistic individuals. Officers cited lack of skills, training, which is often only given to those who are high ranking, and awareness as barriers to inclusive practice, along with inappropriate facilities and time constraints. When a disclosure of the individual's autism diagnosis was made to a police officer, 100% of officers reported that this 'always' or 'sometimes' happened prior to, or during, first contact. The autistic individual's diagnosis was most frequently disclosed by the autistic individual's parent/ caregiver (always = 21.9%; sometimes = 78.1%) or by themselves (always = 6.7%; sometimes = 80%). Autistic adults and caregivers were most unsatisfied with treatment on first encounter (41.2% and 70%) and the explanation they received about the investigation process (41.6% and 72.8%), but autistic adults were mostly satisfied with their treatment by police interviewers (57.1%). A thematic analysis of the open text data revealed themes of Identifying & understanding autism, Catering for needs, Adequacy of training and Mistrust of Police.

Conclusions: The study highlighted a need for appropriate training to be given to all Scottish Police Officers regardless of rank in order for the development of police strategies for effective engagement and inclusion of autistic individuals within the Scottish CJS.

401.028 An Investigation of the Views of Parents of Autistic Students Who Have Experienced School Exclusion

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Background:

Autistic students experience higher levels of school exclusion than their neurotypical peers (Adams, 2022; Guldberg, Wallace, Bradley, Perpa, Ellis & MacLead, 2021). School exclusion has an adverse impact on autistic students' future educational and social outcomes, rendering them disempowered and isolated.

Objectives:

The aim of the current study is to explore the views of the parents of autistic students who have experienced school exclusion in secondary schools in the UK.

Methods:

We conducted semi-structured interviews with 16 parents of autistic students (aged 12-17 years) regarding their children's school experience which led to school exclusion and other forms of school non-attendance. Using Frasier's (2004) seven phases of narrative analysis, we found seven subthemes that dominated through 80 narratives that we constructed.

Results:

Seven subthemes were compared for commonalities and grouped into four categories: Downward Spiral, Breakdown of the School placement; School non-attendance, and Positive Outlooks. Through narrative analysis, we found that despite the struggles their children experienced in secondary schools, the parents recognized their children's strengths and were hopeful regarding their children's futures.

Conclusions:

This study has found that inflexibility of school environments and school staff often leads to school exclusion of autistic children. The complexities of secondary school social and academic expectations contribute to deterioration of mental health of autistic students. In addition, late diagnosis was recognized as another contributing factor that made the school life of autistic students exceptionally difficult. This study has important implications for educators and policy makers regarding listening to autistic community to better engage autistic students in education which will positively impact their future prospects.

401.029 Analyzing and Studying Videos from an Autistic Infancy during Autistic Adulthood

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Background: I am an autistic adult who was born in 1988. From birth to 18 months of age, I was a participant in a research study that was conducted by Mitchell Batavia, who was a graduate student at the time (who would eventually obtain a Ph.D. in Physical Therapy/Pathokinesiology) studying typical infant development. Using myself as a case study, I was filmed from 1988 to 1990 as a part of his research, which chronicled my development in infancy, and included interviews with my parents, who shared observations about my development with Mr. Batavia while he conducted his research. When Mr. Batavia was studying my development, he was under the impression that he was studying a typically developing infant. Unbeknownst to him, I was actually displaying telltale signs of autism from birth (though to be fair, those signs were not widely known by autism professionals back then). Two years later, I was formally diagnosed with autism at the age of 3. 28 years later, in adulthood, I converted the video footage that was filmed by Mr. Batavia into a digital format. When viewing this footage with today's knowledge of autism development in early childhood, it clearly shows that I was displaying telltale signs of autism from birth.

Objectives: To share clips from this footage, display how the symptoms I displayed in infancy were not acknowledged by my parents and the researcher at the time of filming, and describe how the symptoms displayed foreshadowed many issues I have lived with as an autistic person throughout my life. My ultimate goal is to continue to share this video footage in order to support further autism research in early childhood. This presentation will present the footage in the style of the TV show "The Wonder Years."

Methods: I have shown these videos to professionals and researchers in the field of autism, while at autism conferences across the United States, via formal presentations, networking events, and personal communications while at those autism conferences. I have also shared copies of these videos to autism professionals, with the hopes they can be studied further.

Results: Every professional and researcher in the field of autism I have shown clips of this video footage to, in the present day, has been able to identify telltale symptoms of autism, from the first video that was filmed shortly after birth to the final video that was filmed when I was 18 months old.

Conclusions: Although diagnosticians are currently not encouraged to diagnose autism in children until they are at least 2 years old, a growing amount of research has proven that many autistic individuals start displaying symptoms of autism and/or telltale signs of developing autism from birth. Many of these symptoms can predict the issues autistic people may face later in life, and video footage of infants who were diagnosed with autism later in life routinely demonstrate that telltale signs of autism often occurred at birth or in infancy.



401.030 Applying the Principles of Health Literacy and Social Media Literacy to Autism and Neurodiversity Messages on X (Formerly Twitter)

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Background: Social media is a powerful means by which “real-time” data can be collected to gauge what people are talking about (Ohme et al., 2023), especially when it comes to “hot topics” like autism and neurodiversity. Autism is a lifelong neurodevelopmental condition which the Neurodiversity Movement recognizes as an essential byproduct of the neurological differences inherent in humanity (Kapp, 2020). Health literacy describes how people understand, utilize, and disseminate health information in basic, interactive, and critical ways (Nutbeam, 2000). Social media literacy (SoMeLit) is a recently developed framework that describes the requisite content and competencies for making sense of one’s social media engagement (Cho et al., 2024). Adding to emerging research examining autism-related discussion topics on social media (Edwards et al., 2024; Kim et al., 2022), this study applies the principles of health literacy and SoMeLit to the examination of messages pertaining to autism and neurodiversity on “X” (formerly Twitter).

Objectives: This study sought to explore what X users are talking about regarding autism and neurodiversity, and to interpret these findings through the lenses of health literacy and SoMeLit.

Methods: A total of 11,978 messages were collected from X between January-March 2024 using the Postman Twitter API v2 Recent Search “Get” endpoint (Postman & X, 2024). Keywords were a combination of “autism” or “autistic” or “asd” and “neurodiversity” or “neurodivergent” or “neurodiverse.” After data cleaning, 10,653 messages were analyzed using SAS Text Miner 15.3 (SAS Institute Inc., 2023) for topic modeling, resulting in four, five-word strings. Each string was manually inspected to translate the findings into user-friendly topics.

Results: The four topics generated by SAS are delineated in Table 1. The most prolific topic pertained to 1.) making sense of what “neurodivergent” means and how this relates to autism, including general statements about what neurodivergent and autistic people are like and allusions to experienced stigma. The other topics were 2.) hashtag campaigns, 3.) merchandise advertising (with a subset of messages discussing autistic children, not merchandise), and 4.) attempts to spread disinformation and obtain deceptive charity funds via “news” headlines.

Conclusions: Topic 1 messages and the Topic 3 subset of messages about autistic children suggest users’ attempts to understand autism and neurodiversity through questions, statements, and the sharing of lived experiences, actions that reflect interactive health literacy (Nutbeam, 2000) and SoMeLit’s “Evaluation” competency (Cho et al., 2024). Likewise, Topic 2 hashtag campaigns and Topic 3 merchandise advertising messages represent other ways to promote the visibility of autism and neurodiversity, reflecting critical health literacy (Nutbeam, 2000) and SoMeLit’s “Contribution” competency (Cho et al., 2024). The disinformation of Topic 4 could be viewed as a “test” of users’ functional health literacy (Nutbeam, 2000) and SoMeLit’s “Analysis” competency (Cho et al., 2024). Importantly, this study did not measure the accuracy or impact of messages, or users’ awareness of SoMeLit content domains (Self, Medium, Reality; Cho et al., 2024). It is essential that practitioners and researchers aim to equip the public with knowledge about autism and neurodiversity to foster individuals’ health and social media literacy.



401.031 Are Child Social-Emotional Competencies Protective in the Relation between Social-Emotional Behavior Problems and Parenting Stress in Children with Autism Characteristics?

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Background:

Caregivers of autistic toddlers report greater parenting stress and mental health challenges than those raising non-autistic toddlers (Barroso et al., 2018; Schnabel, 2020). Further, autistic toddlers demonstrate elevated social-emotional behavior (SEB) problems and delays in SEB competencies compared to non-autistic toddlers (Reid et al., 2020). Caregiver parenting stress is associated with elevated SEB problems and delays in SEB competencies (Baker et al., 2003; Davis & Carter, 2008). Among caregivers raising autistic toddlers, SEB competencies can act as a protective factor in the relation between SEB problems and parenting stress (Huang et al., 2014). We examine the contributions of SEB problems and competencies to caregiver distress and caregivers' stress about interactions with their toddlers.

Objectives:

We hypothesize that SEB competencies will moderate the relation between BITSEA problem scores and parent distress and caregiver relational stress among caregivers and toddlers with autistic characteristics.

Methods:

Children (16-32 months) in Part C Early Intervention (EI) with social communication delays and their caregivers (n=208) participated in an ongoing community-based Hybrid Type I implementation/effectiveness trial of Caregiver Implemented Reciprocal Imitation Teaching. Caregivers identified children as non-Hispanic White (n=73), Black (n=39), Asian (n=11), Multi-racial (n=28), Hispanic White (n=32), or unknown (n=25). At baseline, caregivers completed the Brief Infant-Toddler Social and Emotional Assessment (BITSEA; Briggs-Gowan & Carter, 2006), a nationally normed screening tool for 12–36-month-olds, which was administered to assess SEB problems and SEB competencies. The Parenting Stress Index (PSI) (Abidin, 1990) is a widely used measure of parenting stress. Two scales are included in this report: Parenting Distress subscale (e.g., "I feel trapped by my responsibilities as a parent") and the Parent-Child Dysfunctional Interaction subscale (e.g., "my child smiles at me much less than I expected").

Results:

Results of a linear regression predicting to PSI relational stress indicated significant unique main effects for SEB problems and SEB competencies as well a significant interaction effect ($R^2 = 0.27$, $F(204) = 5.23$ $p = .23$). The model predicting to PSI parent distress indicated a significant main effect for SEB problems, no main effect for SEB competence, and a significant interaction effect ($R^2 = 0.11$, $F(204) = 8.74$ $p = .03$). To understand the clinical significance of the interaction, the levels of the two parenting stress measures were examined across four groups: No "Of Concern" BITSEA scores, "Of Concern" for problems only, "Of Concern" for competence only, "Of Concern" for both problems and competence. Caregivers with no "Of Concern" and "Of Concern" problem scores only showed similar levels of caregiver relational stress; however, "Of Concern" competencies and "Of Concern" scores for both impacted caregiver relational stress. In the model predicting to caregiver distress, SEB problems only appeared to increase distress when SEB competencies were also "Of Concern." (See Figure). Findings were replicated among toddlers who received an ASD diagnosis.

Conclusions:

As hypothesized, SEB competencies moderated the relation between SEB problems and both parenting distress and caregiver relational stress. These findings are consistent with competencies playing a protective role in the relation between child behavior problems and parenting distress, and relational distress.

**401.032 Asert: A Promising Model for Advancing Support for the Autism Community**

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Background: There are a range of adverse outcomes across the life course associated with an autism diagnosis, including lower quality of life scores, higher rates of comorbid physical and mental health conditions, and a significantly reduced life expectancy among autistic individuals compared to those without autism. Increasing community support and engagement, including access to resources, services, and employment and training opportunities may mitigate these adverse outcomes. For the past fifteen years, the Autism Services, Education, Resources, and Training (ASERT) Collaborative has been working to identify the needs of autistic individuals across Pennsylvania and improve access to quality resources, services, and data to support the autism community across the state. ASERT is a unique collaboration that brings together academic institutions and state government to develop practical research projects and community-focused efforts to support people on the autism spectrum, their families, and providers.

Objectives: To support the diverse needs of the autism community, their families, and support staff by implementing a diverse array of strategic goals, evaluation efforts, and major initiatives across Pennsylvania, with the potential for ASERT to serve as a model program for other countries or states.

Methods: ASERT collects and analyzes data through a variety of methods. First, ASERT maintains a statewide Resource Center that provides direct connections with the autism community and responds to inquiries in real time. Age, county of residence, role, and reason for inquiry are recorded on an ongoing basis and satisfaction surveys are collected from individuals who contact the Resource Center. Second, the ASERT website is continuously updated with the latest news, events, and training opportunities. Website analytics, including number of visitors, pageviews, sources, location, and top pages, allow for constant monitoring and quality improvement. Third, ASERT provides a variety of trainings for self-advocates, parents/caregivers, professionals, and the general community. Data is collected on reach and satisfaction with trainings.

Results: Since September 2019, over 6,000 people have been assisted through the ASERT Resource Center, including individuals from all counties within Pennsylvania, and over 470 individuals residing outside of the state. Of the 218 respondents to the satisfaction survey, over 90% agreed or strongly agreed that the Resource Center staff and resources were helpful, and they were likely to call the Resource Center again. Since September 2019, over 1.1 million unique ASERT website visitors have viewed resource pages over 2.4 million times. Visitors to the website have come from over 200 countries and territories across the world, and all 50 US states. Since 2015, ASERT has trained over 30,234 people across Pennsylvania and conducted over 260 virtual and 616 in-person training events.

Conclusions: ASERT has reached thousands of autistic Pennsylvanians, families, and support professionals through ongoing programming, resources, and training opportunities. Results indicate a promising practice model with the potential to be replicated and adapted in other states to fit unique needs for the broader intellectual and developmental disability (IDD) community. Future evaluation efforts could be focused on understanding the impact of this model on knowledge, attitudes, and beliefs among individuals, families, and providers.

401.033 Ask Me What I Think: Exploring Autistic Middle and High School Student's Satisfaction with School Services

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Background: Given the increasing number of autistic students served in schools (OSEP, 2024) and documented challenges for students in middle and high school (Hedges et al., 2014), there have been increased efforts to understand the quality of services for this age group (Kraemmer et al., 2019). Despite initiatives to increase access to high quality services (Roberts & Webster, 2020), few researchers have focused on the development of methods to understand autistic students' perspective on the services they receive in school and their overall satisfaction with services.

Objectives: We aim to provide insights from the community informed co-design of a student-specific assessment and present autistic middle and high school students' reflections on satisfaction with school services.

Methods: We engaged in a community-partnered iterative co-design process to develop a student-specific assessment including two focus groups with autistic teens (n=7) and their caregivers (n=2) and advisory board consisting of autistic young adults (n=2). Autistic youth co-designed definitions, developed visual representations of the constructs, renamed the survey to "How Can We Support You?" and tested the tool to evaluate usability. Participants were compensated \$200. Then, autistic middle and high school students (n=34) participated in pilot testing of the survey. Participants were 67% male and 79% white (average age=13.1, average grade=7.4). The survey took approximately 15 minutes to complete, and participants were compensated \$20 for their completion. Although the "How Can We Support You?" survey has questions related to support received in school and areas of need, this presentation will focus on the autistic youth's response to seven questions related to satisfaction with school services.

Results: The seven satisfaction questions used a Likert scale from 1 (Strongly Disagree) to 5 (Strongly Agree). The item with the highest mean score was "I think my teachers listen to my needs" (M=4.12). This was closely followed by "I am satisfied with the teachers who provide supports for me at school" (M=4.00). The statements "I think my teachers are qualified to help students like me," "I think my teachers know how to work with me," and "I think my teachers know how to support me" were rated with mean scores of 3.97, 3.76, and 3.74, respectively. The two lowest-rated items were "The different types of supports offered at my school have helped me," and "I am satisfied with how many different types of supports are offered at my school for me," which received mean scores of 3.68 and 3.59, respectively. Overall, the average satisfaction score across all seven items was 3.84 which indicates general agreement with the statements.

Conclusions: Providing opportunities for autistic students to voice feedback on the services they receive in school is essential to ensure the relevance and impact of these supports. Lower scores related to the effectiveness and variety of available support suggest that continued work is needed in the ongoing assessment of student needs and implementation of practices that effectively address these areas. The co-design and pilot findings point to the utility of the "How Can We Support You" survey for assessing student satisfaction.

401.034 Associations between Autistic Traits and Parental Differential Treatment

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Background:

Numerous studies have shown that parental differential treatment (PDT), or parental favoritism, has negative implications for healthy development including depressive symptoms, challenges in sibling relationships (Jensen et al., 2013), and externalizing behaviors (Rolan & Marceau, 2018). While PDT has been studied as a whole, much is still unknown about why parents may favor their children in specific ways (Jensen et al., 2023).

Objectives:

The current study sought to identify autistic traits that may elicit parental differential treatment (PDT). Because of the multifaceted nature of autism, findings from this study have the potential to provide insights to parents about how they may be treating their children differently, based on their child's unique set of autistic traits/behaviors.

Methods:

Participants (recruited via Amazon Mechanical Turk) completed a survey assessing their experiences of parental differential treatment and their own autistic traits using the Autism Quotient (AQ) measure (Baron-Cohen et al., 2001). Participants were young adults ages 18-29 (*M age* = 25.4; 57% Female, 43% Male; 73% White, *n* = 739) who resided in the U.S. and had at least one living sibling.

Results:

Using regression analysis, we examined PDT across six domains (conflict, time, affection, perceived favoritism, communication, and financial support). Independent variables included five domains of autistic traits (deficiencies in social skill, communication, attention switching, attention to detail, and imagination) and demographic controls. Results revealed that participants lower in social skills or higher in attention to detail, per the AQ measure, received less favored treatment in comparison to a sibling in some domains (conflict). In contrast, participants with more challenges with imagination received relatively favored treatment in other domains (affection, financial support, being liked more, and communication).

Conclusions:

Our findings suggest that certain autistic traits are correlated with specific types of parental favoritism. Discussion will focus on these trends and their implications for familial relationships. As there is growing evidence for the significance of autistic behaviors and identifying as autistic, over a clinical autism diagnosis, our study provides evidence that these behaviors do influence family relationships in different ways. As autism is a spectrum and can present itself in many ways, using our findings parents may be able to identify their autistic child's autism profile and how they may be prone to favor/disfavor that child according to it.

401.035 Attitudes Toward Medicinal or Recreational Marijuana Use in the Autism Community

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Background: In preparation for a clinical trial investigating the safety and efficacy of marijuana to reduce anxiety in adults with autism, we conducted three stakeholder focus groups to learn more about attitudes related to marijuana as a potential treatment. Marijuana is generally perceived as harmless and is currently available without restriction. However, negative health effects of chronic usage are well documented (Bedillion et al., 2022). Marijuana use has escalated dramatically with legalization, making it second only to alcohol in abused drugs (SAMHSA, 2022). As marijuana is easily obtained by adults and can be used as a method to self-medicate, it is important to learn the thoughts of key stakeholders representing the autism community.

Objectives: This is an observational study to explore the attitudes of key stakeholder groups representing the autism community on marijuana recreational use and as a treatment.

Methods: To avoid possible bias introduced by knowledge of the autism research center that is conducting the clinical trial, an independent research group recruited and conducted informed consent for participants in three stakeholder focus groups: 1) Caregivers of people diagnosed with autism (n=15); 2) Young Adults aged 18-30 diagnosed with autism (n=11); and 3) Healthcare Providers (licensed psychologists, BCBA's, Occupational Therapists, Aesthetic Technician, SLP's, and founders/managers of agencies) who regularly serve people with autism (n=15). Stakeholder groups were split in half and two focus groups were conducted for each stakeholder group. The independent research group worked collaboratively with the autism center to develop a list of questions to address: 1) challenges associated with ASD, 2) medication and treatment options, 3) marijuana and 4) marijuana as a treatment option.

Results: Participants in all groups expressed favorable or neutral opinions about the legalization of marijuana, indicating calming effects, potential to reduce anxiety, improve quality of sleep, and appetite, favoring natural treatments over synthetic, pharmaceutical treatments. They also believe these positive effects can increase quality of life. Groups also expressed concern about the limited research on long-term effects (on cognition and overall health) as well as limited evidence for therapeutic benefits. They were also concerned about limited quality control of marijuana products (THC percentage, strains, dosage). Caregivers also expressed a concern related to autism-related communication challenges because it may be difficult to report undesirable side effects. Quotes in Table 1.

Conclusions: Stakeholders are in favor of natural treatments vs. synthetic treatments and believe that marijuana-based products have the potential to be beneficial, but more research and regulatory control of ingredients are needed. Unique insight from the caregiver group was that it is difficult to find medical professionals willing to work with autistic individuals, and that commonly professionals try to treat various symptoms without considering the person's greater needs. The health care professionals group also shared insight that they see in their fields that professionals refuse to work with those in the autism community, which shows the need to bridge this gap to better treat individuals with autism.



401.036 Autism ALERT: Exploring the Experiences of Families Working Toward Autism Evaluation and Diagnosis with Family Navigator Assistance

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Background: Family navigation holds promise for reducing stressors and facilitating early autism diagnosis; however, little is known about how navigation impacts families' experiences of autism diagnostic assessment.

Objectives: To understand the family experience of telehealth autism navigation, and to explore mechanisms by which navigation improves access to care.

Methods: This project evaluated Autism ALERT, a pilot site-randomized trial of family navigation for children with autism symptoms. 50 families participated from 7 Oregon primary care clinics: 30 families were assigned to telehealth family navigation as the intervention arm, and 20 families were assigned to information-only as the control arm. Families in both arms completed 2 self-administered surveys: on enrollment (baseline) and after 6 months. Surveys consisted of standardized scales used to assess Family Centered Care (FCC), Care Coordination (CC), Shared Decision Making (SDM), Autism Knowledge, Family Empowerment, Family Stress, and Parenting Stress, and (in the intervention arm) Navigator Satisfaction. For data analysis, we summarized the change in each score from baseline to 6 months (change in mean/change in proportion) using intention to treat, comparing intervention vs. control arms. We calculated p-values using the Generalized Estimating Equation (GEE) difference-in-difference models. Finally, we summarized Navigator Satisfaction with descriptive statistics.

Results: Of the 50 families enrolled in Autism ALERT, 48 completed the baseline survey (96%) and 36 (72%) completed the 6-month survey. Child participants were 17% female, 39.6% Latino, 85.1% English speaking and 56.3% White. Families in the intervention arm experienced non-significant increases in FCC (14.3% increase in the intervention vs 1.7% increase in the control arm; $p = 0.56$), CC (2.4% increase vs. -5% in the control arm), SDM (19% increase vs. 11.7% increase in control arm; $p = 0.743$), and Autism Knowledge (61% increase vs. 50% increase in the control arm; $p = 0.49$). Changes in family empowerment (-1.41 in the intervention arm vs. -1.23 in the control arm; $p = 0.849$) family stress (-0.66 in the intervention arm vs. -0.45 in control; $p = 0.802$), and parenting stress (2.09 in the intervention arm vs. 1.83 in control arm; $p = 0.80$) were similar in both groups. Finally, 70% of intervention families felt satisfied or highly satisfied with all aspects of family navigation.

Conclusions: A majority of families had high satisfaction with family navigation and non-significant positive effects were observed for FCC, CC, SDM, and autism knowledge for families engaged in family navigation compared to the information-only control group. Although results are limited due to sample size and self-reported nature of survey-based data collection, this pilot study suggests beneficial aspects of telehealth navigation for families. Interestingly, family navigation did not seem to decrease family/parenting stress or family empowerment during the journey to an autism diagnosis. This suggests other factors contributing to stress and empowerment not directly addressed by family navigation. Future larger studies could provide more information on mechanisms which contribute to the success of family navigation for families seeking an autism diagnosis.

401.037 Feasibility & Acceptability of UC Leadership Academy for Emerging Disability Rights Leaders: Review of Pilot Program
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Background: Recent appeals for targeted research and training in self-advocacy and policy skills underscore the necessity of elevating the voices of individuals with intellectual and developmental disabilities (IWIDD), including autism, as required by the Developmental Disabilities Assistance and Bill of Rights Act of 2000 (DD Act; Public Law 106-402, 106th Congress). In response to this need, UCLA Tarjan Center UCEDD and UC-LEND held their inaugural UC Leadership Academy for Emerging Disability Rights Leaders (“Leadership Academy”) in Spring 2024.

Objectives: This study assessed the feasibility and acceptability of a novel Leadership Academy to teach IWIDD skills related to disability policy and self-advocacy.

Methods: The Leadership Academy was a 10-week program in which 10 IWIDD met virtually for two-hour weekly sessions. Based on a previous needs assessment and feedback from IWIDD, curriculum focused on disability policy (e.g., history of disability rights in America, introduction to government) and self-advocacy skills (e.g., advocacy and testifying, storytelling). The program culminated in a leadership showcase in which fellows presented on their advocacy topic. Upon completion of the program, participants answered questions related to each session’s curriculum and provided ratings for the content and skills taught. Feasibility was evaluated based on retention rates, attendance, and survey completion.

Acceptability was measured through participant satisfaction surveys and qualitative responses in their application and showcase presentation.

Results: Nine fellows graduated the program, including six who self-identified as autistic (mean age = 27, SD = 7.4). Results indicated high feasibility, with 90% retention rate and 66% survey response rate. Moreover, 77% of participants attended greater than 80% of the sessions. Participants reported positive experiences with the program, with 100% of respondents indicating they *agreed* or *strongly agreed* that they gained knowledge about relevant advocacy topics, improved in their introductory self-advocacy skills, and that the structure and presentations of the program were effective and helpful.

Additionally, qualitative review of the autistic fellow’s applications suggested that 45% of respondents were interested in *self-advocacy in the workplace or classroom* and 36% of respondents were interested in *learning leadership skills as a means of supporting their community*. In survey responses of autistic graduates, 50% expressed interest in learning more about *current disability rights activities and opportunities* and 50% reported interest in *self-advocacy in the workplace or classroom*. Moreover, the session *Advocacy in Practice* was ranked “most helpful” by 83% of respondents.

Conclusions: Findings suggest that the pilot Leadership Academy is both feasible and acceptable, providing a strong foundation for future programming. Results highlight the importance of teaching IWIDD skills related to disability policy and self-advocacy. Future programs should consider including additional topics related to *current/ongoing advocacy events* and/or *advocacy in practice: self-advocacy in the workplace and classroom* which may enhance the program’s effectiveness in meeting self-advocates’ needs.

401.038 Autism Diagnosis: Where Is It Happening, with Whom, and Why?

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Background: In the US, a formal autism diagnosis by specialty mental health (SMH) clinicians trained in autism assessment is needed for access to condition-specific services. However, there are long waitlists for SMH diagnostic evaluations, reflecting limited SMH workforce availability. The American Academy of Pediatrics supports primary care provider (PCP) autism diagnosis as a means of accelerating access to autism care; however, it is unclear how widespread this practice is in the US, or whether access to PCP diagnosis is equitable.

Objectives: Use a national dataset of Medicaid/CHIP insurance claims to assess the frequency of PCP versus SMH diagnosis of autism in early childhood, the association of child sociodemographic and neighborhood factors with PCP versus SMH diagnosis, and whether the COVID-19 pandemic impacted rates of PCP diagnosis.

Methods: Using Transformed Medicaid Statistical Information System Analytic Files (TAF) from 14 states with sufficient claims volume and complete data, we conducted an exploratory retrospective cohort analysis of children ages 1-5 who were first diagnosed with autism between 2017 and mid-2020. Taxonomy codes and claims for well-child visits captured different provider types. Diagnosis by provider type (i.e., PCP vs. SMH) before and during the COVID-19 pandemic was compared according to patient (i.e., age, sex, race and ethnicity) and geographic characteristics (urbanicity, state). Restricting to pre-COVID data, we then explored factors associated with a PCP diagnosis using Ordinary Least Squares (OLS) regression models including state-fixed effects.

Results: PCP diagnosis varied by state, ranging from 14.5% in North Dakota to 49.8% in Nevada, and by race and ethnicity, ranging from 22.3% for Black children to 32.9% for Hispanic children (Figure 1). Among children who received an autism diagnosis before (n=21,368) and during (n=1,883) COVID, 25.7% and 22.9% were diagnosed by a PCP as opposed to a SMH provider, respectively. The first few months of COVID show early signs of a negative diagnosis trend for both PCPs and SMH providers, but more data is needed to understand diagnosis patterns and variation since the start of COVID. In an adjusted OLS model (Figure 2), we found that compared to white children, children with Hispanic ethnicity were more likely to be diagnosed by a PCP versus an SMH provider (4.65 percentage points, 95% C.I. 2.1p.p. - 7.21p.p., p < 0.001).

Conclusions: This study suggests that over 1/5 of Medicaid- and CHIP-enrolled children ages 1-5 receive an autism diagnosis from a PCP rather than a specialty provider. Even so, there is substantial variability in PCP diagnosis rates by state. We also observed that Hispanic children were significantly more likely than white children to be diagnosed by a PCP versus a SMH provider. Additional research will include TAF data from 2020-2021 to better understand diagnosis trends before and during COVID and describe how to reach children who need an autism diagnosis more equitably.



401.039 Autism Intervention in Mexico-U.S. Border Cities: Examining Providers' Training, Challenges, and Services.

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Background:

Autism varies globally, with significant differences in identification, access to intervention, and policies across countries (de Leeuw et al., 2020). In Mexico, the prevalence of autism remains uncertain, given that the most recent data is a decade old (Fombonne et al., 2016). Existing studies have shown that caregivers are typically the first to raise concerns with professionals when seeking diagnosis and services (Montenegro et al., 2022). However, there is a gap in understanding the training of Mexican professionals to work with autistic children and provide services in a Mexico-U.S. border city.

Objectives:

This study aims to explore 1) the educational background and professional experience of early intervention autism providers in Mexican border cities, 2) challenges these providers face when supporting families, and 3) the scope of service provided and interactions with transborder populations.

Methods:

Participants included Mexican psychologists (n=9), child psychologists (n=1), special education teacher (n=1), and school psychologist (n = 1; N = 12, Mean age = 29) through purposeful and snowball sampling. Inclusion criteria included 1) working in a Mexican border city and 2) working with at least one autistic child. Participants completed a consent form, a demographic form, and a semi-structured interview via Qualtrics. Inductive thematic analysis was performed using the Dedoose software.

Results:

Using a convergent parallel design, the study evaluated providers' experiences using surveys and semi-structured interviews (Creswell, 2014). The analysis generated four main themes: 1) Notable gap in autism-focused training in university-level education in Mexico. Ten participants reported not receiving specialized autism training during their undergraduate and graduate studies, and all sought additional certifications from international sources such as Europe, the U.S., or other Latin American countries. 2) Providers highlight the challenges faced by the Mexican government and mental health systems, such as the high costs and waiting periods ranging from 1 week to 6 months for services. Providers complete a socioeconomic assessment to offer families free therapy sessions, psychoeducation, school support, and materials. 3) A range of both evidence-based practices (EBP) and non-EBP were provided, including ABA, play therapy, speech therapy, occupational therapy, sensory therapy, art therapy, recreational therapy, equine therapy, and music therapy. All providers reported working with American families, adapting to caregivers' cross-border travel needs, and offering English-language resources. However, providers expressed frustration with the U.S. health system's lack of flexibility, particularly in allowing Mexican providers to complete school rotations to better support their clients.

Conclusions:

There is a critical need for autism-specific training in Mexico. Access to services is heavily influenced by socioeconomic factors, creating disparities in service delivery. Despite these challenges, autism providers in Mexico are highly motivated to meet their clients' needs by adapting their therapy practices. The services provided in a border city reflect a mix of EBP and non-EBP, shaped by resource limitations but also highlighting innovative approaches in binational settings.

401.040 Autism Terminology Preferences in a Large United States Sample

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Background:

How researchers should talk about autism and its diversity is controversial. Numerous studies investigate community preferences regarding English-language autism terms, but results are inconsistent, possibly reflecting sampling differences (Archibald et al., 2024).

Objectives:

To examine autism terminology preferences in a large USA sample.

Methods:

5382 autistic people and parents of autistic people (464 autistic parents, 1683 autistic non-parents, and 3235 non-autistic parents, from 4724 families; 1616 male, 3534 female, 232 nonbinary/nonconforming/other; $M_{age}=41.24$), recruited from SPARK Research Match, rated liking and offensiveness of autism terms (e.g., “autism”), heterogeneity terms (e.g., functioning levels), and person terms (e.g., “person with autism”). Bayesian probit multilevel models analyzed group- and term-based rating differences, accounting for nesting within families. Marginal predictions were compared across items/groups, based on 95% highest-density credible intervals.

Results:

Autism (Fig. 1): “Autism” was more liked and less offensive than other terms. The term “autism spectrum development” was liked least, but “autism spectrum condition” was most offensive. “Autism spectrum disorder” and “...development” were less liked by and more offensive to autistic parents and autistic non-parents than to non-autistics.

Heterogeneity (Fig. 1): “Autism with low/high support needs” was relatively well liked and offensive compared to alternatives. “Profound autism” was least liked and most offensive. Heterogeneity terms were usually liked more, and always statistically rated as less offensive, by non-autistic parents relative to both autistic groups. However, “autism with high/low support needs” was liked more by autistic and non-autistic parents compared to autistic non-parents, and “autism with/without intellectual disability” was liked more by non-autistic parents than autistic people who were not parents. Most heterogeneity terms, except references to support needs or intellectual disability, were more offensive to autistic parents than autistic non-parents.

Person (Fig. 2): “Person on the autism spectrum” and “person with autism” were statistically most liked overall, and the former was least offensive; however, both autistic groups rated them as less liked and more offensive than non-autistic parents. “Person diagnosed with autism,” “person who has autism,” “person with autism spectrum disorder,” “person who is autistic,” and “autistic person” were slightly less liked overall, but “autistic person” was more liked and less offensive in both autistic groups than among non-autistic parents; non-autistic parents preferred the three terms including “with.” “Person suffering from autism” was least liked and most offensive.

Conclusions:

Participants showed varied preferences, but they – especially autistic participants – apparently disliked many clinical terms and heterogeneity terms, with simple and neutral-valanced terms such as “autism” and references to support needs. The terms “profound autism” and “person suffering from autism” were especially disliked. These results provide insight into terms that should be avoided by researchers/clinicians, but although the sample is large, it is not representative of the autism community in the USA or internationally. Only 107 participants reported intellectual disability diagnoses, and only 1113 were Hispanic/Latine/Spanish, non-White, or mixed-race. Further directions include investigating diversity of terminology views and their relation to sociodemographic factors and neurodiversity movement awareness/support, which will provide more nuanced insights.



401.041 Autistic Adults and Caregivers' Perceptions and Usage of Cannabis: A Mixed Methods Qualitative Study

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Background:

In the United States, cannabis was initially identified as medicinal. The criminalization and stigmatization of cannabis, beginning in the 20th century, resulted in limiting access to illicit channels and relatively little research on the use and impacts of cannabis. With legal access to cannabis expanding through state medical and recreational policies, autism been identified as a qualifying condition for medicinal cannabis in some states, including Pennsylvania. Little is known about how cannabis is perceived, used, and accessed in the autism community. In Pennsylvania, despite parental advocacy in 2017 to make autism a qualifying condition, less than one percent of medical cannabis patients use the diagnosis to access cannabis.

Objectives:

This study used surveys and interviews to 1. describe autistic adults' and caregivers' opinions and perceptions of cannabis, 2. characterize behaviors, decisions, and usage around cannabis within this population, and 3. better understand this population's motivations and barriers to accessing medical cannabis.

Methods:

A total of 119 autistic adults, 52 caregivers of autistic individuals, and 9 autistic caregivers completed a survey that included questions about attitudes and behaviors related to cannabis, as well as demographic information. All participants were Pennsylvania residents. From this sample, a subset of 19 participants who were actively using cannabis were selected to participate in follow-up interviews to better understand their experiences with and perspectives on cannabis use.

Results:

We found that caregivers generally believed that cannabis was age-inappropriate for their minor children. Participants reported that few medical providers addressed potential risks or benefits of cannabis use. Most autistic adults (82%) had used cannabis at least once. Preliminary findings from the interviews indicated that participants generally had positive impressions of cannabis. They used cannabis to help with common co-occurring conditions, such as anxiety and chronic pain. Some participants said they used cannabis for autism-specific challenges, such as to help them cope with sensory sensitivity and overstimulation. For some participants, cannabis use supported functioning in daily activities, including eating, sleeping, socializing, and focusing on tasks. Most participants did not use autism as their qualifying condition for receiving medical cannabis, instead often opting to use anxiety or PTSD. Race and class also shaped access and use – many low income and/or participants of color used informal means, such as dealers or friends, to obtain cannabis, or they purchased cannabis from neighboring states where recreational cannabis use is legal.

Conclusions:

Recommendations related to cannabis policies and legalization, cannabis programs, and the need for clinical trials involving autistic individuals are discussed.

401.042 Autistic Psychiatrists' Experiences of Recognising Themselves and Others As Autistic: A Qualitative Study

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Background: Diagnosis of autism falls under the remit of psychiatry and is currently based on externally observed differences from a perceived norm. Recognition that psychiatrists could be autistic is recent. Embodying such differences may inhibit recognition that one is actually different from the majority. Alternatively, autistic strengths such as enhanced pattern recognition may aid self-recognition. Psychiatrists are the second largest specialty group in Autistic Doctors International (ADI), an online community of autistic doctors.

Objectives: To explore experiences of autistic psychiatrists in relation to recognising themselves and others as autistic.

Methods: A qualitative study using loosely structured interviews and interpretive phenomenological analysis.

Results: Eight autistic, senior psychiatrists based in the United Kingdom were recruited from "ADI Psych" a psychiatry specific subgroup of ADI. One had a childhood diagnosis, two were diagnosed as adults; the remainder self-identified as autistic. Three themes were identified.

Theme 1: Recognising oneself as autistic. Recognition of autism followed diagnosis of their children or encounters with autistic patients, with one participant reporting that "*these are my people*". Barriers to self-recognition included lack of autism training, deficit-based diagnostic criteria and stereotypical views of autism.

Theme 2: Recognising autistic colleagues. Recognising that they were autistic led to the realisation that many colleagues were also likely autistic, particularly those in neurodevelopmental psychiatry.

"Looking around psychiatrists there are those that are clearly autistic and... usually pretty involved in neurodevelopmental disorder."

Theme 3: Not recognising autistic patients. All participants reported the ability to quickly recognise autistic patients, and to develop good rapport easily, once aware of their own autistic identity. Difficulties recognising patients as autistic occurred prior to self-recognition when they shared autistic characteristics and experiences.

"Well, we all do that don't we, meaning I do that so therefore obviously everybody else does... my benchmark for what's 'normal' is me."

One participant reflected on a long career in academic clinical practice, and involvement in development of diagnostic tools still used today. His lack of awareness had potential implications for the validity of instruments developed, as some items apparently lacked specificity.

"I remember arguing about rating scales... this question seemed quite inappropriate because.. someone like myself could say 'yes that's me' therefore it wasn't really a good one for picking up autism."

Conclusions: Autistic psychiatrists face multiple barriers to recognising that they are autistic. Lack of such self-recognition may have negative implications for the validity of assessment processes and may impede diagnostic accuracy with autistic patients. We acknowledge that a minority of our participants had an official autism diagnosis. The accuracy of self-identification in psychiatry is a contentious area, particularly in relation to autism. However, our participants were psychiatrists whose clinical roles involve autism diagnosis. Membership of "ADI Psych" involves scrutiny by other psychiatrists and acceptance within the group offers community confirmation when the group consists of psychiatrists who regularly diagnose autism. Self-recognition and disclosure by autistic psychiatrists may be facilitated by reframing the traditional deficit-based view of autism towards a neurodiversity-affirmative approach, with consequent benefits for autistic patients.



401.043 Autistic Student-Driven Priorities for Belonging in Higher Education.

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Background: Increasing research investigates belonging in Autistic post-secondary (PS) students, exploring facilitators and barriers, experiences of belonging, and the impact of specific support services.^{1,2,3} However, many Autistic students report feeling a lack of belonging, which is associated with poorer academic and social outcomes in PS settings. *Belonging*, characterized by acceptance and value from others across social contexts, is argued as imperative for maintaining academic success and motivation.⁴ Evidently, PS institutions must make systemic changes to address prevailing inequities and promote Autistic student belonging, as highlighted by Neurodiversity advocates and allies.⁵ However, few researchers have asked Autistic students for their perspectives on institutional changes to promote their belonging, despite increasing calls for the importance of participatory autism research and utilizing this knowledge to serve Autistic communities.⁶

Objectives: This qualitative analysis aims to amplify Autistic PS students' perspectives in shaping institutional change to enhance their sense of belonging on campus. Specifically, it seeks to answer: (1) What changes do Autistic students identify as essential for fostering a greater sense of belonging at their institutions? (2) What priorities should institutions focus on to create more inclusive and supportive environments for Autistic students?

Methods: The Belonging Questionnaire (TBQ) was developed using a participatory approach and included short and long-answer questions to explore the university experiences of Autistic students. Nine long-answer questions provided in-depth insights into belonging on campus, emphasizing social, environmental, and accessibility factors. Eligible participants were self-identified Autistic individuals who had completed at least six months of PS education in Canada. This study focused on responses to the prompt: "What do you think universities should be doing to identify and build environments in which autistic students are welcomed?" Using reflexive thematic analysis⁷, responses were inductively coded into emerging priorities, then defined, refined, and organized into five key themes.

Results: The study included 27 Autistic adults with diverse racial, ethnic, gender, and sexual identities. We identified five priorities within their responses: (i) *Tailored Autism-specific services* to meet their unique needs, (ii) *Neuro-affirming Autism education* for faculty, staff, and students to foster understanding of Autistic ways of being, (iii) *Building an inclusive culture* through policy and outreach, with meaningful involvement of Autistic students, (iv) *Developing and supporting student groups*, both identity- and interest-based, to encourage social connections, and (v) *Ensuring sensory safety on campus*, including access to sensory rooms and regulation tools to create a more welcoming environment and enhance their sense of belonging.

Conclusions: This study emphasizes a disability justice-informed approach to amplify Autistic students' perspectives in shaping institutional change for greater belonging, aligning with calls for participatory research.⁸ The identified priorities - tailored services, neuro-affirming education, inclusive culture through policy and outreach, support for student groups, and sensory safety - reflect existing literature on the need for inclusive practices.⁹ However, a gap remains between advocacy and action. Closing this gap through genuine collaboration with Autistic students is key to creating supportive academic environments.



401.044 Autistic Women and Sustained Employment: Navigating Gender and Neurotypical Norms in Workplaces

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Background: Employment participation is promoted as a social determinant of health in prevailing public health discourses. However, sustaining paid work can be challenging for autistic women compared to non-autistic people and autistic men, even when they are highly qualified for the work. Many autistic women experience adverse social and mental health consequences as they 'work' to sustain employment. Little research exists about autistic women's workplace experiences.

Objectives: Our study examined how autism and gender intersect and impact on employment participation and workplace supports for autistic women in Ontario, Canada. We aimed to:

1. explore how work is experienced by autistic women from the perspectives of autistic women, employers, and employment support professionals;
2. examine the intersectionality of gender and autism and its impact on their workplace experiences and sustained employment; and,
3. explore what workplace accommodations and supports they found helpful and what were the implementation challenges and opportunities.

Methods: This qualitative study involved in-depth interviews with two groups of participants: 1) autistic women with paid work experience, and 2) employers or employment support professionals who had arranged workplace supports for autistic women. Reflexive thematic analysis methods (Braun & Clarke, 2021) were used to identify patterns in the data related to 1) gender, autism, workplace experiences and sustained employment, and 2) workplace accommodations and supports. Data sources were interview transcripts and the interviewer's post-interview reflective memos. Transcripts and memos were read and discussed by a subset of the research team to develop a coding scheme, then coded by a research assistant using NVivo software. Key themes were generated, reviewed and refined at regular intervals with the larger research team, which included researchers, trainees, autistic women advisors, and representatives from organizations supporting/employing autistic people.

Results: Ten autistic women and eight disability employment support/human resource professionals participated in the study. Navigating gender and neurotypical norms for workplace behaviours had consequences for sustained employment and the wellbeing of autistic women. Participants across groups discussed workplace challenges for autistic women including: navigating stereotypes and assumptions about autism based on child and male presentations, navigating expectations and conventions for gendered social behaviours, adapting to shifts in job roles and responsibilities; not noticing or engaging in cultural workplace practices; communicating with male supervisors; experiencing discomfort from physical and sensory environments; feeling overlooked in Equity, Diversity, Inclusion and Accessibility (EDIA) workplace initiatives; and experiencing marginalization and micro-aggressions by colleagues and superiors. Autistic women participants also discussed undergoing formal reviews and conflict management processes, taking leave-of-absences, being fired and leaving employment. Collective ideas for supportive workplaces included: structured, predictable tasks and responsibilities, clear expectations for roles and deliverables, access to mental health supports and formal mentors, accessible workspaces, and employer training on autism and neurodiversity-affirming workplaces.

Conclusions: Our research provides insights into autistic women's employment experiences, and highlights areas where improvements in workplace policies and practices can be made. These included greater attention to making workspaces gender- and neuro-inclusive and explicitly discussing gender, neurodiversity and mitigation of challenges and inequities experienced by autistic women in EDIA initiatives.

401.045 Filipino Generation Z College Students' Autism Knowledge Lack of Effect on Autism Stigma

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Background: Initiatives to reduce stigma included increasing people's knowledge of Autism, adhering to a segment of Turnock's theory (2022) of Autism Stigma which suggests that individuals with higher knowledge of Autism have lower stigmatization. Multiple studies conferred with this idea (Golson et al., 2022; Jones et al., 2021; Kitchin et al., 2021; Kuzminski et al., 2019; Sasson & Morrison, 2017; Underhill et al., 2019), while other studies challenged it, presenting alternative variables that might bear a more substantial influence (Gillespie-Lynch et al., 2017; Underhill et al., 2019; White et al., 2019). Further complicating debates on the relationship, even if awareness and knowledge of Autism is increasing especially in younger populations (Stronach et al., 2018; White et al., 2016), Autistic individuals and children still experience Autism Stigma today (Botha, 2021; Botha et al., 2020; Catubigan et al., 2023; Joseph & Delariarte, 2023; Lasco et al., 2022; Pascua & Dizon, 2022). While these findings provided valuable insights to the discussion, they were primarily derived from Western settings. With this, multiple gaps in the topic exist, namely the unclear relationship between Autism Knowledge and Autism Stigma, especially in younger populations, and information that considers non-Western contexts.

Objectives: Responding to the inconsistent findings regarding an individual's Autism Knowledge and its effect on their endorsed Autism Stigma, this study investigated whether Filipino Gen-Z College Students who had a better grasp of Autism endorsed less stigma against autistic individuals. Additionally, this study investigated whether Filipino Gen-Z College Students who were affiliated with autistic individuals presented an even greater grasp of Autism endorsed lesser stigma or not.

Methods: 126 respondents completed a survey disseminated through social media for this Cross-Sectional Explanatory study (Johnson, 2001). The survey asked Filipino Gen Z College Students, between the ages of 18 to 27 years old, to disclose their affiliation status and accomplish the Autism Spectrum Knowledge Scale General Population Version, Social Attitudes Towards ASD Scale, and Marlowe-Crowne Social Desirability Scale (Form C). Respondents with high social desirability were omitted. Data was analyzed through a Linear Regression and Moderation Analysis

Results: Findings suggested that respondents who were knowledgeable about Autism did not necessarily endorse lower stigma, $t = -1.46$, $\beta = 0.18$, $95\%CI: -0.63, 0.09$, $p = .14$. Likewise, respondents affiliated with an autistic individual did not present lower stigma, $t = -0.58$, $\beta = 1.31$, $95\%CI: -3.37, 1.83$, $p = .56$. Respondents also reported higher Autism Knowledge and Autism Stigma compared to past samples.

Conclusions: Results indicated that even with the understanding of Autism heightened, stigma remains a concern. This may reflect shared Autism-related information's technical symptomatology-base. The approach may have inadvertently highlighted disruptions and maladaptivity which may further endorse negative reactions and stigma towards Autistic individuals. With this, approaches to Autism inclusion do not necessarily need to anchor strictly on sharing technicalities. Instead, they can focus on a more holistic and nuanced presentation

401.046 Awareness and Stigma of Autism in Chinese Parents of Autistic Children

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Background:

Autism prevalence is on the rise in China (Sun et al., 2019). However, previous research around the globe has found that public in China have poorer knowledge about autism, including its causes, symptoms, and long-term consequences, than those in the Western countries (Harrison et al., 2023; Wei et al., 2022; Yu et al., 2020). Little is known about the level of autism knowledge among Chinese parents of autistic children specifically, although Leung et al. (2023) commented that Chinese parents may not be as sophisticated as their Western counterparts in recognizing the features of autism. Lack of autism knowledge may result in delayed diagnosis, elevated parental stress and poor psychological well-being (e.g., Zaki et al, 2016). Thus, it is crucial to understand the autism knowledge in Chinese parents of autistic children and the underlying demographic factors influence the level of such knowledge. Our findings can shed light on the direction of intervention for Chinese parents of autistic individuals (e.g., provision of workshops to enhance autism knowledge).

Objectives:

The current study aimed to examine the level of autism knowledge in Chinese parents of autistic children and compared it to the standard of adequate autism knowledge established in Harrison et al. (2017) and to identify factors that contributed to autism knowledge. We hypothesized that Chinese parents of autistic children have lower level of autism knowledge than the public in western societies, but their knowledge may vary with family demographics.

Methods: 98 parents of autistic children (88 females; Mean age=40.80; SD=5.12) completed the demographic questionnaire and Autism Stigma and Knowledge Questionnaire (ASK-Q; Harrison et al., 2017) which includes four sub-scales: Diagnosis, etiology, treatment, and stigma. On average they earned USD3800- 6400/month and attained sub-degrees.

Results: Chinese parents of autistic children, on average, demonstrated adequate autism knowledge on all four sub-scales (Table 1). Parents' age was negatively correlated with treatment scores ($r=-0.241, p=0.019$). Children's chronological age and age of autism diagnosis were negatively correlated with parents' diagnosis scores ($r=-0.238, p=0.018$; $r=-0.333, p=0.002$; respectively). There was no significant difference in autism knowledge between mothers and fathers. Non-working parents scored lower in the stigma sub-scale than working parents ($F=6.26, p=0.014$). There were significant and positive associations between levels of education and scores on treatment as well as stigma ($F=4.03, p=0.005$; $F=5.76, p<0.001$; respectively). Similarly, family income showed positive correlations with scores on diagnosis, etiology and stigma ($F=2.72, p=0.035$; $F=3.11, p=0.019$; $F=3.025, p=0.022$; respectively). Figure 1 displays ASK-Q across various levels of education and different family income brackets.

Conclusions: Chinese parents in general score higher than those of participants in Harrison et al. (2017). However, there are individual variations in the parents' knowledge about and stigma toward autism and those variations can be accounted for by some of the family demographics. Workshops on enhancing autism knowledge are particularly useful for parents with lower income and education level.

**401.047 Battle of the Bots in Autistic College Student Survey Research**

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Background:

Fraudulent responses which intentionally provide false, irrelevant, or inaccurate data (Meade & Craig, 2012; Nichols, 1989) have become an increasing problem in autism research -- particularly for studies with public recruitment, financial compensation for participants, and/or online data collection. The nascent body of literature on fraudulence offers few suggestions for implementing piecemeal countermeasures of unmeasured effectiveness that struggle to keep pace with the digital and methodological evolutions that have accelerated the infiltration of fraudulent data.

Objectives:

In this paper, we introduce a multidimensional typology of countermeasures and outline ways to streamline their implementation. We then reference three successive waves of data collection in an ongoing study about autistic undergraduates to: demonstrate the scale of the threat potentially posed by bots and frauds; provide explicit examples of how dozens of countermeasures can be deployed; and present initial evidence of their effectiveness.

Methods:

Following wide-ranging recruitment for our Wave 1 survey (e.g., websites, newsletters, social media) we quickly detected an influx of responses, many of which were completed within five minutes and had fake email addresses. We began implementing rudimentary countermeasures thereafter (e.g., required ".edu" email addresses, reverse coded items, ReCaptcha challenges). After 3 months, 6,477 surveys were started and 1,437 were completed. We ultimately concluded only 6.6% of started surveys and 31.9% of completed surveys were legitimate (n=430).

For Wave 2 a year later, we deployed 21 distinct types of countermeasures (e.g., screener, URL tracking, "honey pot" item) across 4 domains: Deter, Prevent, Track, and Detect. Our eventual fraud detection spreadsheet included 44 individual indicators of potential fraud, 38 of which were automatically calculated and aggregated into 4 summary scores which in turn yielded a provisional assessment of legitimacy [auto-reject, presumed-legit, or unclear] based on a 12-branch decision tree. All except the auto-rejected cases received an additional one or two rounds of human review by members of our research team before any final determination of legitimacy was made.

Results:

Although our survey link was clicked approximately 4,000 times, our preventative efforts brought the number of started surveys down from 6,477 in Wave 1 to only 1,526 in Wave 2; 334 of those failed the screener and 287 did not make it through the main survey, yielding 904 completed surveys. Ultimately, 33.4% of started surveys and 56.3% of completed surveys were deemed legitimate (n=509), a dramatic improvement over the prior year.

Wave 3 data collection is occurring in fall 2024 with even more countermeasures in place; results from this wave will be ready to present by conference time.

Conclusions:

Combating the threat of bots and frauds is fraught with challenges, complications, and compromises as researchers navigate tensions between ethics, equity, effort, and evidence. Implementation of countermeasures is limited by various types of capacity: technological, researcher knowledge and skill, time, and resource requirements (Godinho et al., 2020). However, our study demonstrates that proactive, coordinated, and comprehensive efforts to combat fraud can improve efficiency and accuracy in autism research.

401.048 Beyond the Surface: Investigating Ptss in Caregivers of Adults with Ndd

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Background:

Caregivers of adults with neurodevelopmental disorders (NDD), particularly in Singapore, experience significant emotional and psychological distress, often exhibiting posttraumatic stress symptoms (PTSS). This study builds on prior research, exploring how the caregiving environment, behaviors of individuals with NDD, and cognitive responses contribute to the development of PTSS in caregivers. There is a gap in research regarding caregivers in multicultural, non-Western settings, which this study seeks to address.

Objectives:

The study aims to quantify the occurrence of PTSS in caregivers of adults with NDD in Singapore. Specific objectives include investigating the relationship between caregiver burden, coping strategies, and PTSS, while examining the moderating roles of cultural beliefs and caregiver burden. It also explores the mediating role of caregiver cognition in the development of PTSS.

Methods:

A quantitative, exploratory research design was employed. Participants were 45 primary caregivers of adults (aged 19 years and older) with NDD receiving treatment at Singapore's Institute of Mental Health. Data were collected via validated self-report questionnaires, including the PTSD Checklist for DSM-5 (PCL-5), Modified Overt Aggression Scale (MOAS), and Coping Strategies Inventory-S (CSI-S). Descriptive statistics, correlation, regression, moderation, and mediation analyses were conducted using SPSS version 29.

Results:

Preliminary data indicated that 11.1% of caregivers met DSM-5 criteria for PTSD, with 6.7% meeting the PCL-5 cutoff for PTSS. The most reported PTSS symptom was intrusive thoughts (82.2%), followed by arousal and reactivity (77.8%), while avoidance was least reported (42.2%). Aggressive behaviors of NDD individuals correlated significantly with caregiver PTSS ($p < 0.05$). The caregivers' adult children exhibited significant behavioral challenges, with 53.3% of caregivers identifying physical aggression as the most traumatic caregiving event, followed by verbal aggression (22.2%). Event rumination and intrusive cognition significantly mediated the relationship between aggressive behaviors and PTSS, explaining 53.3% of the variance. Coping strategies were also examined, with disengagement coping (e.g., avoidance, denial) found to significantly predict both trauma symptoms and caregiver burden ($p < 0.01$), while engagement coping (e.g., problem-solving, seeking support) did not significantly mitigate these outcomes. Disengagement coping strategies were associated with higher PTSS and greater caregiver burden. Caregiver burden moderated the impact of aggressive behaviors on PTSS, with higher burden levels exacerbating the trauma impact.

Conclusions:

This exploratory study highlights the significant psychological impact on caregivers of adults with NDD in Singapore, particularly regarding aggressive behaviors and PTSS. Cognitive processes, such as intrusive rumination, play a crucial mediating role, suggesting the need for targeted cognitive-behavioral interventions. The moderating effect of caregiver burden underscores the importance of support structures to alleviate burden and mitigate trauma impact. Future research should expand sample sizes and explore the cultural and societal influences on caregivers, and the coping mechanisms employed to manage the stressors associated with their roles to understand caregivers in non-Western settings.

401.049 Biology, Language, and Ethics: Insights on Autism Genetics Research from Diverse Perspectives

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Background:

With the advancing understanding of autism genetics, there is a clear and pressing need for consultation with autistic constituents. The establishment of a dialogue allowing bidirectional information flow between autistic individuals, family members, and genetic researchers is anticipated to address ethical concerns, improve research quality, and ensure research goals are in alignment with community values. This is the mission of HEARD (Healthy Engagement in Autism Research Dialogue). By engaging experts in the field, we have aimed to clarify misconceptions and promote a nuanced understanding of genetic influences on autism. By bringing together diverse perspectives, we are equipped to answer the question: What does this research mean for the autistic community?

Objectives:

To report results from the first year of HEARD discussions and engage the INSAR genetics research community in a dialogue about constituent priorities, the risks and benefits of current approaches in autism genetics research, and future research directions.

Methods:

Each structured monthly meeting begins with a presentation on a topic in autism genetics by a field expert, followed by a discussion that brings together diverse perspectives to contextualize the genetic findings. Recordings of the discussions were made and subsequently analyzed to identify common themes and key findings. Where relevant, primary literature is reviewed and integrated to support results.

Results:

Analyses yielded three categories of discussion topics: those pertaining to the biology of autism genetics, communication of genetic findings, and the ethical implications of this field of research. From the summaries of biological-focused discussions, we report contemporary insights into the roles of rare and common variation in autism genetics, the relationship between autism and co-occurring conditions, and the influence of common models of autism (discrete, continuous, composite, social construct) on genetic research. Areas of disagreement, such as the definition of autism and the utility of polygenic risk scores as a predictive tool in autism diagnosis, are highlighted. How autism research is communicated in research, media, and clinical settings is found to have profound impacts on the autistic community, including negative health outcomes, misinterpretation/misapplication of results, and negative self-perception. Consequently, we provide recommendations for value-neutral, inclusive language substitutes for commonly used value-negative terminology in autism genetics research. Lastly, we integrate perspectives of autistic individuals and family members to describe ethical concerns in autism genetics research, including perceived negative impacts on the autistic community and disparities between research objectives and community priorities.

Conclusions: From a year of structured discussions with experts and constituents, we have identified discordant perceptions of the biology, language, and ethical interpretations of autism genetics research. Here, we summarize the key findings and present specific recommendations for terminology and research objectives. We aim to engage the autism genetics research community in a respectful and informative dialogue. By challenging traditional models in autism genetics, we hope to facilitate autism genetics research that is inclusive of the diversity of autistic experiences.

401.050 COVID-19 Disruptions to Autism Care: A Brief Report on Unmet Needs and Access Barriers

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Background: Autism spectrum disorder (ASD) is a neurodevelopmental condition characterized by social communication and social interaction deficits, along with patterns of restricted and repetitive behaviors. To address these skill deficits and improve overall functioning, children with ASD require comprehensive services, including diagnostic assessments (Monteiro et al., 2016), early intervention (Choi et al. 2021; Gitimoghaddam et al. 2022), and a variety of behavioral and social interventions (Makrygianni et al. 2018; Wolstencroft et al. 2018). The COVID-19 pandemic had a profound impact on the delivery of services for children with ASD in the United States. Families reported difficulty accessing the services they needed (Srinivasan et al. 2021), heightened stress levels (Ferguson et al. 2021; White et al. 2021), and challenges obtaining educational support (Hurwitz et al. 2021). Additionally, it forced a shift towards telehealth, with mixed results regarding efficacy and accessibility (Ellison et al. 2021).

Objectives: To better understand how the pandemic exacerbated existing disparities in access to services, affecting an already vulnerable population, a needs assessment was critical for identifying the specific services required by children with ASD and their caregivers during the pandemic, as well as the barriers to accessing these services.

Methods: This study utilized a needs assessment to identify services sought by families with children with ASD under the age of 18, as well as the barriers they faced in accessing these services during the pandemic. A total of 27 caregivers of children with ASD ($M_{age} = 47.37$, $SD_{age} = 10.49$) participated in this study. A mixed method approach was utilized to while considering this small research sample size. First, descriptive statistics, including means, frequencies, and percentages, were generated to summarize findings for an overview of the responses. Second, the frequencies of services needed and the barriers were analyzed using descriptive statistics and content analysis for open-ended responses. Lastly, the relationships between the total number of services needed and the characteristics of both the caregivers and the children were analyzed quantitatively, using correlations, independent t tests and power analysis, and multiple linear regression with 1,000 bootstrapping repetitions.

Results: The most sought-after service for children with ASD was social skills training, needed by 59.3% of the families. Other frequently required services included speech therapy (51.9%), applied behavior analysis (ABA) therapy (48.2%), occupational therapy (48.2%), parent training and consultation (44.4%), and child psychotherapy (40.7%). In addition, the most frequently reported barriers to accessing services were preference for face-to-face interactions over online services ($n = 29$), limited availability of providers with expertise in ASD ($n = 19$), and child challenging behavior ($n = 18$). Lastly, multiple linear regression analyses revealed that child anger was a significant predictor of the number of services sought.

Conclusions: This study highlights the significant unmet needs for various essential services among children with ASD during the COVID-19 pandemic. The findings underscore the importance of addressing barriers to access, such as the limited availability of ASD-specialized providers and the challenges posed by child anger, to ensure that families receive the necessary support during times of crisis.

401.051 Caregiver Experiences with Autism Diagnosis in Children with Down Syndrome

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Background: The co-occurrence of Autism Spectrum Disorder (ASD) in children with Down Syndrome (DS) creates significant diagnostic challenges, with ASD symptoms often misattributed to DS, leading to delays in diagnosis and early interventions. While research on ASD in individuals with DS has largely focused on clinical and basic science perspectives, little attention has been given to caregivers' experiences, their interactions with healthcare systems, and the factors prompting further ASD evaluations. In Canada, research on ASD in children with DS and their families is limited. This study is among the first to explore caregiver perspectives on navigating the diagnostic process.

Objectives: Explore the experiences of caregivers whose children with DS have been diagnosed with ASD, focusing on the diagnostic journey, how they adapt to their changed lives and engage with healthcare systems.

Methods: Using a convergent parallel mixed-methods design, quantitative data were gathered through structured surveys ($n=21$), and qualitative insights were collected from semi-structured interviews ($n=11$). Participants were caregivers of children under 18 with confirmed DS-ASD diagnoses, recruited through Down syndrome associations, limiting the experiences by excluding families not connected to these groups. Those awaiting ASD assessments were excluded. Data was collected from March to June 2024, following approval from the University of Toronto's Research Ethics Board. Descriptive statistics were used to analyze survey data, while interviews underwent inductive thematic analysis.

Results: Participants were primarily from Ontario (86%), with smaller groups from British Columbia and Alberta. Caregivers described **confusion throughout the diagnostic process**, feeling "lost in the system" and "repeatedly dismissed" by healthcare professionals. Most shared that their concerns were "not taken seriously," with behaviors frequently attributed as "normal" or "typical" for a child with DS. ASD assessments were often delayed by years due to **reluctance among providers**, who felt "signs of autism could be similar to that of children with DS." For most, receiving ASD diagnosis brought emotional relief, helping them understand their child's behaviors and reframe expectations. Caregivers coped by building informal support networks, educating themselves through workshops and conferences, and establishing routines that minimized transition challenges. However, they faced ongoing challenges accessing tailored interventions and managing fragmented care. Quantitative data showed the **mean age of ASD symptom onset was 2.76 years** ($SD = 1.73$). Diagnoses occurred between **3 and 12 years**, with a **median diagnosis age** of 6 years. While most diagnoses were delayed - by about four years - a few children were diagnosed by age 4, these had a family history of ASD or intellectual disability, early regression, and access to specialized centers. Frequently reported early symptoms included repetitive behaviors (100%), speech delays/regression (90.5%), and sensory sensitivities (62%).

Conclusions: Children with DS face diagnostic delays for ASD, even though caregivers often recognize early developmental differences. Families experience emotional strain from fragmented care and highlight the need for tailored interventions, as current approaches rarely address DS and ASD together. These findings highlight the need for improved diagnostic frameworks and integrated care models that address dual diagnosis DS-ASD, with potential to shape clinical guidelines, interventions and healthcare policies.

401.052 Caregiver Psychiatric Symptoms, Assessment Delay, and Access to Supports for Children with Neurodevelopmental Conditions

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Background: Children with neurodevelopmental conditions, such as autism, typically present with many transdiagnostic needs which extend to the broader family unit. Caregivers of these children frequently encounter substantial barriers when seeking interventions and support services, which can lead to increased stress and negatively impact their mental health and well-being. There is also evidence that caregivers with poorer mental health may also experience longer delays in accessing services for their child, which may further impact their mental health. However, the mental health of caregivers is not typically assessed as part of standard clinical practice, despite recommendations and growing evidence advocating for such assessments. Additionally, there has been little research exploring the relationship between caregiver psychiatric symptoms and their assessment and support needs during a child's neurodevelopmental assessment.

Objectives: The aim of this study was to explore the relationship between caregiver psychiatric symptoms and child diagnostic assessment delays, as well as access and needs for supports at the time of diagnostic assessment.

Methods: This cross-sectional study reports on data from the Sydney Child Neurodevelopment Research Registry. Participants were caregivers of children attending a tertiary-level assessment service for a multi-disciplinary neurodevelopmental and diagnostic assessment, commonly for autism. Caregivers completed questionnaires asking about their current psychiatric symptoms (depression, anxiety, caregiver strain). Caregivers also provided information about intervention history and use of support services, for both the child receiving assessment, and for caregivers themselves. **Results:** Participants were caregivers of 187 children aged 1.63 – 16.58 years ($M=6.97$, $SD=3.76$, 72% male). Overall, 71% of children received a diagnosis of autism. Results showed that caregivers with elevated psychiatric symptoms had a one-year delay in accessing developmental assessments, compared to children of caregivers without elevated symptoms. This was despite there being no significant difference in the age at which caregivers first detected a developmental delay in children. Caregivers with elevated psychiatric symptoms also reported a greater desire for interventions and support services for themselves and their child, and increased difficulties when attempting to access these supports. Further, caregivers with elevated psychiatric symptoms reported more barriers when accessing services compared to caregivers without elevated symptoms. Caregivers with elevated psychiatric symptoms were significantly more likely to report problems with transport, increased time to coordinate care and a lack of knowledge about where to go or who to contact, as barriers which impacted their ability to access interventions.

Conclusions: These results highlight an important and likely complex relationship between caregiver psychiatric symptoms and access to assessment and support services for children with neurodevelopmental conditions, the most prevalent of which was autism. Caregivers with psychiatric symptoms have greater service needs for themselves and their child and report more barriers when trying to access these services. Results suggest elevated caregiver psychiatric symptoms provide a useful indicator for enhanced support pathways and specialised care.

401.054 Caregiver-Reported Character Strengths of Youth on the Autism Spectrum

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Background: Historically, autism research emphasizes the deficits and challenges of autistic people. However, more recent studies aim to highlight the strengths of people on the spectrum. While strengths-focused autism research continues to develop, existing literature on strengths and positive traits of people on the spectrum is still in its early stages. Character strengths are positive traits that influence thoughts, feelings, and behaviours and allow one to think about one's life more positively. The Values in Action (VIA) Classification of Strengths is the most widely known measure of character strengths, which identifies 24 character strengths grouped into six overarching values. Although the VIA classification has been widely used among a general population of parents to help identify their children's strengths, its use in autism research remains limited. While some studies have examined character strengths in autistic people using the VIA framework, no studies to our knowledge have directly used it to measure parent-reported strengths of youth on the spectrum.

Objectives: We administered a caregiver-rated version of the VIA Youth Survey (VIA-Youth) to explore caregiver-reported strengths of youth on the autism spectrum.

Methods: Twenty-five caregivers (M age = 42.4 years; 60% female) of youth on the autism spectrum ages 10 to 17 (M age = 11.9 years; nine identified as male, 15 identified as female, and one youth identified as non-binary) participated. Our cross-sectional survey included demographic questions, a measure of daily living skills (i.e., The Waisman Activities of Daily Living Scale [WAD-L]), and an adapted version of the 96-item version of the VIA-Youth Classification of Strengths. Data analysis involved calculating descriptive statistics, including total W-ADL scores and mean scores for the VIA-Youth's 24 strengths and six virtues. We conducted additional exploratory subgroup analyses to identify the top three character strengths for youth with different support needs and youth with communication differences.

Results: Overall, caregivers' top-rated VIA character strengths were Humility (i.e., accurately evaluates accomplishments; thinks well of themselves, but is aware of their mistakes) and Appreciation of Beauty and Excellence (i.e., notices beauty and/or skilled performance in the physical environment, skills and talents, or moral goodness); the lowest-rated character strength among their children was Leadership. Of the six overarching VIA values, Courage (i.e., can face adversity), Humanity (i.e., has caring relationships with others), Temperance (i.e., engages in habits in healthy ways, manages excess consumption), and Transcendence (i.e., finds meaning in life, feels connected to the larger universe) had the highest mean scores, while Wisdom and Justice had lower mean scores.

Conclusions: The findings of our study have important implications for autistic youth, their family members, and allies. Espousing a strengths-focused orientation that highlights positive traits is essential to fostering growth, opportunity, and flourishing among youth on the spectrum. Additionally, this work may encourage researchers and practitioners to prioritize character strengths to enhance services and supports for autistic youth and their families.

401.055 Challenges and Empowerment: Autistic Mothers' Experiences with Parenting and Societal Reactions

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Background:

Parenthood presents significant challenges, and for autistic mothers, these are compounded by a lack of support and societal misconceptions (McDonnell & DeLucia, 2021; Pohl et al., 2020). Autistic mothers frequently face prejudice, unsolicited advice, and ableism, complicating their parenting experience. Despite studies showing that 85% of autistic mothers find motherhood rewarding - experiencing similar levels of satisfaction, effectiveness, and parental stress as non-autistic (allistic) mothers (Lau et al., 2021; Adams et al., 2021) - they continue to face stigma and judgment. In response, the Female Autism Network of the Netherlands (FANN), a collaborative group of practitioners, researchers, and autistic women, sought to investigate the societal reactions faced by autistic mothers.

Objectives:

The objective of this study is to deepen understanding of the challenges autistic mothers face and advocate for a more inclusive and supportive parenting environment. By examining societal reactions, the study aims to raise awareness and encourage a shift toward empowerment and acceptance.

Methods:

FANN conducted an online survey to gather insights from 97 autistic mothers, all of whom had a formal ASD diagnosis. The participants had a mean age of 42.16 years (SD = 8.23), with an average age of autism diagnosis at 36.70 years (SD = 10.38). Only six mothers were diagnosed before the age of 18. The average number of children was 1.98 (SD = 0.96), with eight mothers having four or more children. A thematic content analysis was conducted to analyze the responses.

Results:

Autistic mothers reported that their children were a significant source of sensory stimuli, often leading to extreme fatigue. Many expressed fears about motherhood, including concerns about failing as a parent. Additionally, mothers frequently engaged in masking - concealing their fears and discomfort to cope, which often led to avoiding social situations.

Regarding societal reactions, many mothers noted a lack of response, largely attributed to their late autism diagnosis or reluctance to disclose their diagnosis. Dismissive remarks such as, "I don't think you have autism," or "Having a young family is tough for everyone," were common. Some mothers experienced judgment about their decision to have children, often being labeled as irresponsible, with comments like, "Do you even know what you're getting into?" Despite these challenges, some mothers did report receiving positive reactions alongside the unsolicited advice they encountered.

Conclusions:

Autistic mothers delivered a strong message about their lived experiences, emphasizing the need for increased awareness: "Most people don't understand what autism means in daily life." They also called for broader recognition that "Autism is not wrong or limited; it's just a different way of thinking." Moreover, they underscored their capability as parents, stating, "We are perfectly capable of raising children, especially autistic children."

The findings underscore the importance of listening to the needs of autistic parents, promoting greater understanding, and focusing on empowerment rather than condescension to support their parenting journey.

401.056 Family Support As a Protective Factor for Parenting Stress

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Background:

Many parents of young children with developmental delays report clinically high levels of parenting stress (Postorino et al., 2019). Importantly, higher rates of child behavior problems are correlated with increased parenting stress (Staunton et al., 2023). Early intervention often targets child challenging behavior in hopes of collateral effects on parenting stress (Kurtz et al., 2021). However, associations between parent-level and child-level demographic variables and parenting stress are not well understood. This study investigated the relationship between child challenging behavior, parent confidence, family support, child adaptive behavior, demographic information, and parenting stress in a sample of families with preschool-aged children with delays who were enrolled in a larger longitudinal randomized control trial of a parenting intervention.

Objectives:

1. Describe the relationship between child challenging behavior and parenting stress, after accounting for parent-level demographic information (e.g., income, maternal education, employment, family support), child diagnosis, and parent confidence in managing child challenging behavior.
2. Examine the role of family support in predicting parenting stress after accounting for parent-level demographic information (e.g., income, maternal education, employment), child challenging behavior, and parent confidence in managing child challenging behavior.

Methods:

Participants in this study included 181 caregivers (91% female, mean age= 32, $SD=7$) of children aged 30–36 months with developmental delay or disabilities (DD) enrolled in Oregon Parent Project: An RCT of Parent Training for Preschoolers with Delays (R01 HD059838; McIntyre, PI). Eligible children received early intervention services, had delays in adaptive behavior (standard scores between 45 and 75 on Vineland Adaptive Behavior Composite), were ambulatory, and did not experience major sensory impairments (e.g., deafness, blindness). Caregivers completed measures of parenting stress (Parenting Stress Index Short Form), parent confidence in handling child challenging behavior (Parenting Tasks Checklist), child behavior problems (Child Behavior Checklist), social support (Family Support Scale), and demographic information. Descriptive statistics and multiple regressions were used to analyze data.

Results:

Multiple linear regression was used to test if child challenging behavior, parent confidence in managing child challenging behavior, and family support significantly predicted parenting stress after accounting for demographic variables. The overall regression was statistically significant ($R^2 = 0.50$, $F(5, 169) = 35.42$, $p < 0.01$). It was found that child challenging behavior significantly predicted higher parent stress ($\beta = 0.39$, $p < 0.01$). It was found that parent ratings of support significantly predicted lower parent stress ($\beta = -0.16$, $p < 0.05$).

Conclusions:

Results suggest that for caregivers of young children with developmental delay or disabilities, there is a significant positive relationship between child challenging behavior and parenting stress. The key finding from this study was that after accounting for relevant demographic variables and child challenging behavior, parent ratings of support predicted lower parenting stress. Limitations include that all measures were parent self-report, and the Parenting Stress Index measures some overlapping information with the child behavior checklist. Future analyses will explore differences in intervention outcomes based on these baseline predictors of lower parenting stress.



401.057 Chinese American Parents' Experiences of Autism Diagnosis Process during COVID-19 and Their Family's Perceptions about Their Children's Disabilities: A Qualitative Study

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Background: Early diagnosis is crucial for early intervention in children with autism spectrum disorder (ASD); however, significant racial, ethnic, socioeconomic, and linguistic disparities persist in autism identification and access to services. Although existing studies highlight these disparities, there is a notable lack of research exploring the experiences and perceptions of Chinese parents regarding the ASD diagnostic process. The Chinese population is often underrepresented in autism research and frequently groups diverse Asian subgroups together, however, all Asians do not have the same cultural practices. The differences in autism history and the uniqueness of each Asian ethnic group provide a compelling reason to attempt to better understand Chinese American caregivers' perceptions and experience of the ASD diagnostic process.

Objectives: This study aims to examine: 1) the experiences of Chinese immigrant parents during the autism diagnosis process, and 2) their family's perceptions about their child's disabilities.

Methods: Six Chinese immigrant mothers of children with autism residing in the United States participated in 1 to 1.5-hour interviews conducted via Zoom.

Results: Five mothers noted that they first noticed their child's abnormal behavior through a lack of response to their name, while one noticed avoidance of eye contact. Initially, all six mothers attributed these concerns to limited social interactions due to COVID-19, delaying their decision to seek help. Language delay was the primary motivation for pursuing medical evaluation, with diagnoses typically occurring before age 3.

COVID-19 resulted in long wait times for a diagnosis, with one mother waiting up to a year. Some diagnoses were conducted online, raising concerns about their accuracy. None of the parents received explanations about autism, forcing them to research on their own, which further delayed access to services. One mother even sought a second diagnosis in China for confirmation. When discussing their children's conditions, all parents described their children's condition in terms of specific behavioral traits such as difficulty making eye contact, poor attention span, delayed language development, and extreme sensitivity to certain sounds. Four mothers acknowledged the unknown cause of autism, while one blamed environmental factors and another hoped for a cure. All mothers identified themselves as the primary caregivers for their autistic children and expressed feelings of being misunderstood by the children's grandparents and fathers regarding their caregiving efforts. They faced blame for not adequately caring for or educating the child, which they believed contributed to the child's autism or worsening issues. One mother mentioned that her husband and mother-in-law wished for another healthy son to carry on the family name.

Conclusions: This study offered valuable insights into the unique experiences, perceptions, and challenges faced by Chinese immigrant families. It highlighted how cultural beliefs and values shape Chinese immigrant parents' understanding of autism and their diagnostic journeys. The parents' varied emotional reactions to the diagnosis—ranging from disbelief and anger to rapid acceptance—underscore the need for tailored communication strategies that respect cultural sensitivities. Furthermore, the study identified the significant pressures experienced by mothers, informing service providers on how to better support parental well-being and improve family quality of life.

401.058 Clinician Conceptualization of Camouflaging (Social Coping) across Neurotypes and Mental Health Conditions

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Background:

Camouflaging (a.k.a. masking or social coping) is described as hiding neurodivergent characteristics (e.g., stimming behaviours) or adopting neurotypical social behaviours (e.g., adjusting eye contact). Little is known about how this concept is integrated into assessment and therapy delivered by clinicians, especially in the context of different neurotypes and mental health conditions with differences in social behaviour (e.g., Social Anxiety Disorder, SAD), sensorimotor behaviours (e.g., Tourette's Syndrome, TS; Attention-Deficit/Hyperactivity Disorder, ADHD), academic concerns (e.g., Learning Disabilities, LD), and emotional distress with social implications (e.g., SAD; Major Depressive Disorder, MDD).

Objectives:

Identify clinician conceptualization of camouflaging within assessment and therapy contexts across neurotypes (i.e., autism, ADHD, TS, LD) and mental health conditions (i.e., SAD, MDD) that show social differences.

Methods:

A mixed-methods survey comprising open-ended questions, multiple choice questions, and visual Likert scales was used to capture a) examples of camouflaging across neurotypes and mental health conditions and b) examples, tools and challenges of understanding camouflaging within clinical practice. Qualitative responses were analysed using thematic analysis.

Data collection is ongoing. So far, 27 clinicians participated. A majority (56%) of respondents were clinical psychologists (amongst social workers, registered psychotherapists, psychiatrists, pediatricians, behavioural therapists, and nurses) who have worked an average of 6.48 ± 7.51 years (range: 0-33). Most clinicians identified as women (88%) and were assigned-female-at-birth (85%), white (56%) and located in Canada (59%). This sample included neurodivergent clinicians, including those self-identified/diagnosed as autistic (15%, $n = 4$) or as having ADHD (33%, $n = 9$).

Results:

Among participants so far, 96% of clinicians have heard about the concept of camouflaging, endorsing a strong understanding of the concept (71 ± 22 out of 100, range 0-94). Bolded terms below indicate emerging themes from qualitative synthesis. Regarding autism, clinicians define camouflaging through examples of **adopted behaviour** (e.g., adjusting for social differences) and **hiding autism-related differences** (e.g., sensorimotor or social differences). It often has the purpose of **fitting into neurotypical environments**, can be **conscious** or **unconscious**, and has mental health **costs** (e.g., burnout). Clinicians also recognized camouflaging in the context of ADHD (63%), SAD (59%), LD (30%), MDD (30%), and TS (15%). Here, camouflaging is defined in terms of general and neurotype/condition-specific strategies (Figure 1).

Over 85% of clinicians were at least 50/100 confident in spotting camouflaging in assessment (64 ± 26 , range: 0-95) and therapy (64 ± 25 , range: 0-100). Clinicians commonly use a mixture of observation, direct inquiry, self-report measures (e.g., Camouflaging Autistic Traits Questionnaire), or building space for clients to self-report camouflaging in assessment and therapy. Accurate and direct measurement remains a key challenge in supporting clients who camouflage (Table 1).

Conclusions:

This ongoing mixed-methods study has identified camouflaging as an emerging construct which is partially integrated into current clinical practice but remains lacking in measurement and conceptual clarity. Limitations include self-selection bias from highly interested/neurodivergent clinicians. Future efforts include refining operationalization and measurement of camouflaging to facilitate clinical care across different neurotypes and mental health conditions.



401.059 Fragile Knowledge: A Computational Discourse and Sentiment Analysis of a Corpus of 60'000 Autism Research Abstracts

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Background: Autism research has been a rapidly changing field that has grown exponentially in the last few decades (Carmona-Serrano et al., 2021). Alongside a general increase in the volume of autism research there has been a growing scrutiny of autism research, for both quality and rigor. For example, autism research has said to have an issue with dehumanization of autistic people (Gernsbacher, 2007), questionable research practices (Poole, 2023), and the lack of harm measurement in intervention studies (Bottema-Beutel et al., 2021). However, its hard to get a full picture of the field given its rapid growth, fast-moving nature, and the density of the literature. Computational textual analysis, and computational discourse analysis has been used to understand attitudes towards autistic people in news media, by analysing large quantities of text in systematic ways – computationally. This type of analysis takes large amounts of information and operationalizes it using a mix of machine learning and human driven analysis. The ability to process hundreds of thousands of words makes it ideal for gaining an overarching understanding of the discourse, rhetoric, and linguistic framing of topics. Its important to understand rhetoric and discourse because the consequences of such construction are material and inform the reality of how minority groups are treated, including autistic people.

Objectives: Thus, the aim of this study was to use a computational textual analysis to model an overview of the field, to explore the rhetoric and conceptualization of autistic people, compared to non-autistic people, and to understand the sentiment with which autistic people are written about.

Methods: In this study we used computational textual analysis methods on a corpus of autism research abstracts ($N = 56829$). First, we conducted a sentiment analysis to identify the valence of the abstracts in how they talked about autistic people and whether this has shifted over time. Next, we used a Natural Language Processing method of identifying the most common Bigrams and Trigrams (which are commonly collocations of teams. These were hand-refined for meaningfulness by removing redundant collocations.

Results: Sentiment was predominantly negative and has not meaningfully changed over time. The collocations of words show a pervasive and particular focus that associates autism with childhood, and pathologizes it as disorder, dysfunction, focuses on co-occurring conditions and prioritizes biological research. Topic modelling supports this focus. Furthermore, non-autistic people were associated with more positive adjectives than autistic people, as well as more agency and power (for example with active verbs, instead of passively). Sentiment analysis between autistic and non-autistic people showed that autistic people were discuss with significantly higher disgust ($p < .01$), fear ($p < .01$), and anger ($p < .01$).

Conclusions: Meta-science about the field is important, including in how we as researchers construct and discuss autistic people. Computational methods are an ideal way for understanding the overview of the field, as well as for paying particular attention to linguistic and rhetorical constructions of autistic people and how it might shape the field.

401.060 Co-Regulation Among Hispanic and Non-Hispanic Mothers of Children with Autism Spectrum Disorder

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Background:

Co-regulation is an interactive process that occurs when parents assist their children in regulating emotional distress (Lobo & Lunkenheimer, 2020). Strategies used during parent-child interactions may influence a child's later ability to effectively regulate their emotional distress on their own (Robson et al., 2020). Children with Autism Spectrum Disorder (ASD) have more difficulties with emotional regulation, thus making successful co-regulation challenging (Valentovich et al., 2018). Studies evaluating interventions to optimize co-regulation between dyads are heavily based on non-Hispanic samples, rooted in Western cultural values.

Objectives:

Given that there may be co-regulation differences as a function of cultural values, the present study aimed to build on existing research by examining the relationship between co-regulation and cultural values of Hispanic mothers raising children with ASD. Specifically, this study explored *marianismo* (i.e., feminine gender role) and *familismo* (i.e., prioritizing family needs) and the quality of mother-child co-regulation.

Methods:

Twenty mothers completed the study questionnaire, which included demographics and the following measures: the Social Communication Questionnaire (Rutter et al., 2003) to assess ASD symptoms; the *Marianismo* Beliefs Scale (Castillo et al., 2010) to assess endorsement of traditional gender role expectations; Sabogal's Familism Scale (Sabogal et al., 1987) to assess familism values; and the Parent Stress Index – Short Form (Abidin, 1995) to measure parenting stress. Eighteen of the 20 mother-child dyads participated in a video recorded observational play-session, which involved three timed phases separated by untimed clean-up transitions (Figure 1). Mutual engagement states were coded so that higher scores of positive engagement indicated good co-regulation (e.g., dyadic enjoyment and attunement) and higher scores of negative engagement indicated poor co-regulation (e.g., dyadic negative affect and less attunement).

Results:

Results demonstrated that there were no significant differences in adherence to Hispanic cultural values between Hispanic and non-Hispanic mothers. *Familismo* did not predict lower parenting stress, but Hispanic mothers had higher parenting stress than non-Hispanic mothers. Hispanic mothers also had higher scores on the 'Family as a Pillar' subscale in the *Marianismo* Beliefs Scale compared to non-Hispanic mothers, suggesting that Hispanic mothers agreed more with beliefs that women are the main source of strength of the family. Although cultural values did not significantly predict co-regulation patterns, trending findings indicated a positive relationship between *marianismo* and positive engagement, and a negative relationship between *familismo* and positive engagement. Negative relationships were also indicated between *marianismo* and negative engagement, and between *familismo* and negative engagement. Possibly, *marianismo* and *familismo* scores may differentially predict mothers' interactions with their children.

Conclusions:

The present study contributed to existing research on co-regulation among minority families by examining co-regulation in a diverse sample of mothers of children with ASD and exploring its potential association with Hispanic cultural values (i.e., *marianismo* and *familismo*). Future directions include focusing on recent immigrants who may exhibit a heightened adherence to Hispanic cultural values compared to highly acculturated Hispanics. This work adds to the growing literature informing culturally sensitive practices when working with Hispanic families affected by ASD.



401.061 Collaborating for Change: Adapting an Autism Parent-Mediated Intervention for Spanish Speaking Latinos

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Background: Access to autism care is often challenging for Latino families due to barriers such as language disparities, stigma, limited availability of culturally competent providers, and socioeconomic factors. Research indicates that with appropriate support, parents can effectively implement intervention strategies and achieve positive outcomes. Involving parents as therapists enables cost-effective, individualized interventions that are easy to implement and generalize while also boosting parental efficacy. Additionally, parent-mediated interventions (PMIs) have been successfully utilized across various ethnic and minority groups, including Latinos. For low-income and marginalized populations, PMIs that are affordable, easy to implement, culturally adaptable, and not require a formal diagnosis help to close treatment gaps.

Objectives: The purpose of this study was to culturally and linguistically adapt the Spanish-version of the World Health Organization Caregiver Skills Training (WHO-CST) for a predominantly Spanish-speaking Latino-populated region in the United States.

Methods: The current study employed a community-based participatory research (CBPR) approach and utilized a phenomenological framework to assess the content and cultural relevance of the Spanish translation of the CST. Program materials were first forward translated to Spanish, then reviewed by four bilingual doctoral students, and finally revised by experienced translators. Once a harmonized Spanish translation was achieved, three 90-minute focus groups were held with Spanish-speaking and bilingual parents (n=18) of children diagnosed with autism spectrum disorder (ASD) to gather insights on potential modifications required to create a culturally responsive and linguistically suitable curriculum. Descriptive statistics were conducted to summarize participants' demographics. Data collected from the focus groups was analyzed using applied thematic analysis.

Results: 27.8% (n=5) of the children had co-occurring conditions, including Intellectual Disability (IDD) and Cerebral Palsy (CP). Of the children, 83.3% (n=15) were male, while 16.7% (n=3) were female. The children's ages ranged from 9 to 17 years ($\bar{x}$ =11.8; SD= 2.11). All caregivers in the study were mothers, and 72.2% (n=13) were bilingual, speaking both English and Spanish, while the remaining 27.8% (n=5) spoke only Spanish. Focus groups conducted resulted in significant adaptations to the Spanish translation of the CST, yielding different subthemes embedded in three main adaptations groups: linguistic, content and environmental adaptations. Findings highlighted the importance of verbiage use by professionals to avoid reinforcing negative stereotypes and to promote empathy and respect for how Spanish-speaking Latino parents perceive certain words. Furthermore, participants emphasized the value of *personalismo* which entails providers transmitting professionalism and warmth and highlights the importance of personalized attention and courtesy in interpersonal interactions.

Conclusions: Through community partnerships and consultations, the present study develops a culturally sensitive and linguistically appropriate version of the CST specifically for Spanish-speaking Latinos, enhancing the overall feasibility and accessibility of the program. Additionally, this study emphasizes the critical need to understand the linguistic and cultural backgrounds of end users before implementing or providing services within the autistic community. By highlighting the value of stakeholder input, the research demonstrates how collaborative efforts can lead to more effective interventions that resonate with unique experiences and needs of Latino families, ultimately promoting better outcomes for parents and children in autism care.

401.062 College Student Viewing and Ratings of Film and Television Representations of Autism

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Background:

Film and television productions can increase viewers' knowledge of autism; as audiences learn about the lived experiences of autistic individuals based on the storyline enacted during the production (Nordahl-Hansen et al., 2018a). Fictional portrayals of autism have been used effectively as an educational tool in clinical and professional development settings (Jerrentrup et al., 2018; Nordahl-Hansen et al., 2018b; Stern & Barnes, 2019). In contrast, other portrayals have perpetuated stereotypes and misinformation about autism (Dean & Nordahl-Hansen, 2021; Jones et al., 2022b), which can negatively impact the lived experiences of autistic people (Jones, 2022a; Orm et al., 2023).

Objectives:

This study examines the extent to which college students a) view films and television shows with autistic characters, and b) rate the authenticity of autistic portrayals.

Methods:

University students (n=91) completed a three-part survey, including a demographic survey, the Social Distance Scale (Gillespie-Lynch et. al, 2015), and the Autism Representation Survey. The Autism Representation Survey was designed for this study and used a multiple choice format to ask participants if they had watched part or all of recent film and television shows featuring fictional autistic characters (*As We See It* (Amazon; 2022), *Atypical* (Netflix; 2017-2021), *Cha Cha Real Smooth* (2022), *Everything's Going to be Okay* (Hulu; 2020), *Extraordinary Attorney Woo* (Netflix; 2022), *Heartbreak High* (Netflix; 2022), *Sesame Street* (Max; 2017-2024), *The A Word* (BBC; 2016-2020), *The Good Doctor* (ABC; 2017-2024)).

Results:

On average, participants had watched about two and a half shows (m =2.52, SD =1.69). For each show, participants reported watching a) the entire show or series, b) part of the film or series, c) only one or two episodes, d) trailers or clips, e) never. The most widely viewed shows were *Atypical*, (19.80% watched the full series and 14.30% watched part of the series), *The Good Doctor* (7.70% watched the full series and 20.90% watched part of the film or series), and *Sesame Street* (4.40% watched the entire series and 18.76% watched the part of the series). Participants rated the authenticity by selecting the three they deemed the most authentic portrayals of autism. Shawn Murphy from *The Good Doctor* (49.5%), Sam Gardener from *Atypical* (23.3%), and Julia from *Sesame Street* (20.9%) were selected most frequently. To examine stigma patterns in relation to participant authenticity ratings, Social Distance Scale composite scores were divided into "High Stigma" and "Low Stigma" scores. Chi-square tests revealed a significant relationship between high stigma ratings and the authenticity ratings of two female characters (Matilda and Julia). Participants with high stigma scores rated these two characters as less authentic than participants with low sigma scores.

Conclusions:

Participant ratings of autistic characters who are white, male savants as being more believable suggests that media overrepresentation of common autism tropes influence audiences' perceptions of autism. Participants with high stigma rated the character of Matilda as less authentic, which is surprising given that the character is played by an autistic actress. These exploratory results highlight the need to examine a possible bias in audience-perceptions of female or gender diverse autistic characters.

401.063 College Students' Explicit Attitudes, Experiences, and Impressions of Autism

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Background:

Academic success relies on interpersonal skills, such as assuming different roles, adjusting to social environments, and building social relationships (Hillier et al., 2017). Despite similar or higher academic engagement compared to their neurotypical (NT) peers (McLeod et al., 2019), autistic college students have lower graduation rates (Kitchin & Karlin, 2021). Autistic students are at risk for social stigma from non-autistic peers, leading to negative social interactions (Bailey et al., 2019). Hesitation to engage with autistic students may stem from a lack of awareness about ASD, influenced by personal attributes like experience with autistic people (White et al., 2016). Additionally, NT college students with more autistic traits themselves held more negative attitudes toward autistic students (Matthews et al., 2015; Wang et al., 2022).

Objectives:

NT students may perceive their autistic peers more positively when a diagnosis is disclosed (Wang et al., 2022). To better understand the predictive role of diagnosis disclosure and personal attributes, we utilized fictional vignettes to examine college student attitudes toward their autistic peers.

Methods:

Undergraduate students ($n = 438$; 74.2% women) at a public university read three vignettes about hypothetical college interactions. Two vignettes described a (labeled and unlabeled) autistic student; the third vignette described a NT student. Participants reported on their autism characteristics using the Broad Autism Phenotype Questionnaire (BAPQ; Hurley et al., 2006), their experiences with autism, and first impressions of the word “autism”. The questionnaires were scored per the scoring instructions, and the “first impressions” responses were qualitatively coded by two independent coders for positive, negative, and neutral valence.

Results:

Analyses revealed that women participants and those with more autism traits had more negative attitudes toward the unlabeled autistic student. Additionally, participants who had fewer autism traits as well as those who identified personally knowing someone with autism had less negative attitudes toward the labeled autistic student (Table 1). Valence analyses revealed participants who reported a negative statement when asked about the word “autism” had more negative affective attitudes toward the labeled autistic student compared to those who reported a positive statement whereas participants who reported a negative statement had more negative cognitive attitudes compared to those who reported a neutral statement (Figure 1).

Conclusions:

The present study expands on previous work examining attitudes and experiences of NT college students toward their autistic peers. Our results indicate the importance of experiences and diagnostic disclosure when considering college students’ perceptions of their autistic peers. Explicit impressions of autism were only related to attitudes when the participant was made aware of the character’s autism diagnosis. Supporting previous work, the fewer autism traits a participant had, the less negatively they felt toward both autistic students, and the less negatively they perceived the labeled autistic student. Future directions should further explore NT college students’ perceptions of autism in naturalistic settings, as participants’ responses to a fictional vignette may differ from their real-world beliefs and actions toward autistic people. Implications of this research include creating more inclusive college spaces for autistic students to succeed both academically and socially.



401.064 Community Perspectives of Sensory Underpinnings of Autistic Feeding Challenges

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Background:

Feeding challenges presenting as food refusal, restricted eating, avoidance of new or unfamiliar foods, and adverse mealtime behaviour are highly common in autism (up to 84%) and are nominated by caregivers of autistic children as amongst the most stressful of parenting issues (Leader et al., 2020). Sensory differences including over- or under-responding to common sensory stimuli may underpin autistic feeding challenges. In reports of autistic feeding challenges from families and clinicians, responses to the sensory quality of foods are often described as overly intense resulting in strong, aversive physical, emotional and/or behavioural reactions to foods. To date, however, there has been no comprehensive examination of the sensory underpinnings of autistic feeding challenges.

Grounding research on the lived experiences of the relevant community is an essential first step in any program of research. Understanding relevant lived experiences provides valuable insight into the expertise, capacity, and needs of the community. In this study, therefore, we sought the lived experience community perspectives on the contribution of sensory differences to autistic feeding challenges.

Objectives:

The objective of this research was to describe the perceptions of autistic adults and caregivers of autistic people (the lived experience community) of the significance of sensory contributions to autistic feeding challenges.

Methods:

Autistic adult (n=8) and carer (n=3) participants participated in one of three focus groups. All groups were run online and were facilitated by a member of the research team with at least one other member of the team in attendance. Community perceptions of the significance of sensory contributions to autistic feeding challenges were explored in the groups through sharing of summaries of literature and lived experiences. First, participants were encouraged to share their experiences via a semi-structure discussion guide. Second, a short presentation of the published literature to date on sensory underpinnings of autistic feeding challenges was given by the research team. This was followed by continued facilitated discussion to capture community reactions to presented literature and additional thoughts or priorities.

Each focus group was recorded, transcribed and thematically analyzed. Three members of the research team independently coded the transcripts for themes within and across participants. Final themes were developed through an iterative process of independent coding and group discussion until consensus was reached.

Results:

Sensory experiences were individualized across participants with many describing in detail their specific sensory responses. However, despite variability participants reported considerable overlap in their preferences and aversions in regard to the sensory properties of foods. Three primary themes were identified across participants: 1) consistency and predictability is essential for food acceptance, 2) sensory preferences drive food acceptance and refusal, and 3) autistic individuals adjust their eating and mealtime experiences to match their sensory preferences and daily regulation needs. Themes and subthemes will be covered in detail during this presentation.

Conclusions:

Findings from this study provide insight into the sensory underpinnings of autistic feeding challenges including both the individuality of sensory experiences and overlapping preferences related to the sensory properties of foods.

401.065 Conceptualizing and Measuring "Problem Behavior" in Early Intervention Autism Research: A Secondary Systematic Review and Evaluation

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Background: Some autistic children exhibit behavior that caregivers, clinicians, and researchers consider problematic, and that may negatively impact their quality of life (Sivathasan et al., 2024). However, there is little consensus about the types of behaviors that constitute a problem, and therefore should be reduced via intervention. In autism intervention research, behaviors labeled “problem behavior” range from inherently harmful behaviors such as aggression and self-injury, to non-normative but not harmful behaviors such as repetitive movements or adherence to routine. Reflecting the variety of ways that problem behavior is conceptualized, researchers also use a variety of measurement systems to assess this construct. Understanding how problem behaviors are conceptualized and measured in autism research is especially important because the presence of problem behavior is often used to justify intervention approaches that many autistic people find objectionable (e.g., punishment-based approaches) (Adams & Erevelles, 2017).

Objectives: We conducted a secondary systematic review of group-design, non-pharmacological intervention studies for autistic children up to age eight to explore researcher conceptualizations of problem behavior, and the measurement systems researchers use to assess problem behavior.

Methods: Studies were selected from a parent systematic review that included 289 intervention studies published prior to November of 2021, the most recent search date. For the secondary review, we located any study in our database in which specific behaviors were targeted for reduction or elimination; 102 studies met this criteria. A coding scheme was applied to these studies by two independent coders to determine: (a) whether reducing problem behavior was described as a purpose of the intervention, (b) the rationale for targeting behaviors for reduction, (c) how the behavior was conceptualized, and (d) how the behaviors were measured. We also consulted instrument manuals and relevant literature to summarize validity and reliability information for the ten most commonly used measures.

Results: Forty-seven percent of studies described reducing behavior as a primary or secondary purpose of the study and/or intervention, 33% gave a rationale for targeting behaviors for reduction, and 28% offered some conceptualization (i.e., gave a conceptual definition, listed examples, or described impacts) of the behavior(s) they targeted. Only 8% offered a conceptual definition. The most commonly used measurement systems were “off-the-shelf” instruments (i.e., at least some validation beyond inter-rater reliability), and were administered as parent reports. Of the ten most common instruments, only two were validated along six different validation dimensions in autistic populations. All but one full scale or subscale assessed behaviors that were either: (a) non-normative but not inherently harmful, or (b) a mix of inherently harmful and non-normative but not inherently harmful.

Conclusions: The construct of “problem behavior” is inadequately conceptualized in the context of intervention research for young autistic children, and assessed by instruments that are lacking across several dimensions of validity. Intervention researchers should provide clear definitions and rationales for targeting behaviors for reduction via intervention, and should develop refined measurement tools for assessing these behaviors in collaboration with the autistic community.

401.066 Consensus Recommendations for Usability and Acceptability of Mobile Health Autism Screening Tools

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Background:

Parents who have developmental concerns about their child may find autism screening tools online. Healthcare providers may also encounter these tools in practice. Online screening tools may improve autism screening through advanced technologies and improved connection to services. However, language, cultural, and technological barriers may impede equitable access to care.

Objectives:

Create consensus recommendations amongst parents, health and educational providers, and autistic adults for equitable design of autism screening apps and websites.

Methods:

We used consensus methodology to develop recommendations for improved online autism screening tool design. There was a total of 14 panelists: 2 pediatricians, 1 child psychiatrist, 2 tool developers, 3 early intervention providers, 3 autistic adults, and 5 parents of children with autism participated in a Modified Delphi panel. Some participants had multiple roles.

The panel included 3 asynchronous rounds of online discussion and voting using Slack (a collaborative communication software), and one live online Zoom videoconference. Participants received a multimedia summary (written summaries, videos, interactive polls) of research on screening tool usability/accessibility, and a list of 28 preliminary design recommendations from our prior research. Each round, participants suggested alternative or additional recommendations, and voted for recommendations. The recommendation list was iteratively revised and reduced. In the final voting round, recommendations were grouped into categories. A final consensus guideline was developed based on the discussions from the videoconference.

Results:

The consensus panel produced 19 final recommendations (Table 1), in 5 conceptual categories: transparency, equity, access, product design and user experience, and development process. There was a total of 50, 70, and 45 comments/suggestions during each asynchronous voting round respectively.

The top three highest ranked statements were “tools should directly link to sources of information about autism and/or community resources, and should allow parents to directly refer the child to child development programs (e.g. Early Intervention)”, “tool’s reading level should be 5th grade or less and should be easily understandable for parents with elementary level math education,” and “tools should be developed for the wide range and variability of behaviors, needs, strengths, and individual experiences associated with autism, including both children with high support needs and children with subtle, atypical, or inconsistent behaviors and presentation.”

Panelists prioritized recommendations that supported family familiarity with autism and systems of autism care. In particular, panelists expressed that tools need linked resources to information about autism and community resources, with an emphasis on local interventions and reputable resources.

Conclusions:

A multidisciplinary panel can translate research findings to actionable recommendations for tool developers for equitable autism screening. Direct input from individuals impacted by current autism screening guidelines can help create guidelines that reflect stakeholder experience.



401.067 Coping and Social Support Among Caregivers of Children Diagnosed with ADHD, Autism, or ADHD+Autism

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Background: Caregivers of children with neurodevelopmental differences, such as attention-deficit/hyperactivity disorder (ADHD) and autism, face unique stressors that may affect coping and access to social support. The compounding effects of behavioral difficulties and the high need for support (e.g., therapies/services) of some children with neurodevelopmental conditions can lead parents to becoming fatigued, which may impact their ability to effectively cope with caregiving demands. Additionally, there are mixed findings on how caregivers of children with ADHD, autism, or ADHD+autism access social support compared to caregivers in the general population. To best meet the needs of caregivers of children with ADHD and/or autism in child-rearing responsibilities, a deeper understanding of their potential strengths or buffers to stressors, including caregiver coping and social support, is needed.

Objectives: This study explored whether there are differences in caregiver coping and social support among caregivers of children with ADHD, autism, and ADHD+autism.

Methods: Data were obtained from the 2022 National Survey of Children's Health, a nationally distributed caregiver-report survey of child health and well-being. Participants were limited to caregivers of children aged 3-17 years ($M = 11.51$ years; 67% male) with a current autism diagnosis ($n = 5,906$). Caregiver coping was operationalized as how well the caregiver was "handling the day-to-day demands of raising children." Responses were dichotomized to "very well" and "somewhat well/not very well/not very well at all." Social support was assessed with the question, "During the past 12 months, was there someone that you could turn to for day-to-day emotional support with parenting or raising children?" Responses were dichotomized into "yes" and "no." We ran multiple binary logistic regressions with caregiver coping as the outcome in one model and caregiver social support as the outcome in the other model. The substantive predictor was caregiver group (ADHD+autism as the referent, compared to ADHD only and autism only). Covariates included child age, race, sex, co-occurring intellectual disability, co-occurring behavior problems, family income, and single parent household.

Results: Results indicated that, accounting for covariates, diagnostic group (ADHD, autism, ADHD+autism) did not significantly predict caregiver coping. Nonetheless, having a child with ADHD only was significantly related to caregiver social support ($B = .27, p = .006$) as compared to having a child with ADHD+autism. Caregivers of children with ADHD reported 1.30 times the odds of having social support compared to caregivers of children with ADHD+autism.

Conclusions: Our findings revealed that having a child with ADHD+autism was associated with a lower likelihood of having social support than having a child with only ADHD. However, diagnostic group (i.e., ADHD, autism, ADHD+autism) was not significantly associated with how well caregivers were handling the day-to-day demands of raising children above and beyond other factors. The results highlight that caregivers of youth with ADHD+autism may be at particular risk for lacking needed social support. Social support is amenable to intervention, and results should inform policies (e.g., increasing access to care) and practices (e.g., incorporating wellness of parents into treatment planning for their children) to optimize supports and functioning of caregivers of children with these neurodevelopmental conditions.

401.068 Correlations between Support Network for Autistic People, Levels of Support and Hours of Therapy According to the Mapa Autismo Brazil.

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Background: The Mapa Autismo Brasil - MAB (Autism Map Brazil) is the first Brazilian non-governmental data survey whose objective is to map the profile and sociodemographic characteristics of people diagnosed with autism in the country. The first stage of the MAB took place in the Federal District in 2023.

Objectives: This study aims to correlate percentage data collected in MAB Stage I regarding the existence of support networks by level of support and compare this finding with the number of hours of therapy reported by respondents.

Methods: The study used non-probability convenience sampling, aiming for a minimum of 382 participants. Data collection was carried out through an online survey from July to September 2023, with responses collected from autistic individuals or their guardians in the administrative regions of the Federal District, Brazil. The survey covered demographics, support levels, educational experiences and other relevant topics. 1,699 valid responses were obtained.

Results: The results obtained indicate that, regarding the level of support reported by the respondents, 56.15% were diagnosed at Level 1, 31.08% at Level 2 and 7.65% at Level 3, denoting an inversely proportional relationship with data from average age of diagnosis: Support Level 3, 4 years; Level 2, 5 years and Level 1, 12 years. Regarding the existence of a support network for autistic people, they responded that they had a support network in times of crisis or similar: 70.55% of autistic people Support Level 1, 61.74% of autistic people Support Level 2 and 44.62% Level 3, also observing an inversely proportional relationship between these variables. The research does not present sufficient elements to infer the reasons for this finding. One hypothesis is that, due to the complexity of care, it is greater as the need for support increases, requiring, proportionally, greater preparation, familiarity and time allocation, it becomes more difficult to have an effective support network for people with greater need for support. It was also found that autistic Support Level 3 people were the population group that had the highest percentage of 'not currently undergoing therapies', at 32.31%. Of those who undergo therapy and are classified as Level 3 of Support, only 13.85% do so for more than 10 hours per week and 20.77% between 5 and 10 hours per week. Would this reality be linked to the lower percentage of existence of a support network (44.62%) or the reasons for the lower number of hours of therapy in a population group that would need greater intensity and therapeutic density would be linked to other difficulties, such as issues financial?

Conclusions: The data obtained in the 1st stage of the MAB show greater vulnerability of Support Level 3 autistic individuals in relation to the support network, completion and length of therapy. The study provided an information-rich portrait of the population profile of autism and raised other questions relevant to understanding the fundamental singularities in autism related to support networks and the implications of their existence or not.



401.069 Creating a Caregiver Education Program with Chinese Caregivers of Autistic Children: A Community Engaged Process

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Background: Chinese caregivers face unique challenges when providing support for their autistic children. Despite a growing body of research highlighting the advantages of caregiver education for both autistic individuals and their caregivers, little is known about what Chinese caregivers of autistic children may want and need within caregiver education. If caregiver education were to be utilized to its full potential to mitigate service disparities; accessibility, sustainability, and acceptance decided by caregivers are critical. However, in many of the extant literature investigating effectiveness of caregiver education, caregivers are typically relegated to the role of passive recipients (i.e., study participants) rather than active contributors; and crucial aspects of caregiver education programs, such as content, modality, duration, and accessibility are determined by researchers. Furthermore, research emphasizes the development and utilization of culturally appropriate education materials for caregivers from diverse backgrounds

Objectives: This preliminary study aimed to address this gap by gathering perspectives and insights into the specific needs and preferences of Chinese caregivers of autistic children in the *pre-development stages* of creating a caregiver education program using a community-engaged approach. We conducted two-stages of focus group discussions with Chinese caregivers of autistic children: 1) before development of the caregiver education content using an interview guide and 2) after we had built two prototype video modules based on the first focus group discussions.

Methods: We invited 14 Chinese caregivers of autistic children to share their needs and perspectives on the content and delivery of a caregiver education program. The study employed a qualitative design, utilizing focus group discussions as the data collection strategy. Focus Group 1 was focused on the content participants would like to see in a comprehensive caregiver education program. After Focus Group 1 was completed, we analyzed the results and created two prototype education videos based on participant feedback. The prototype videos served as topic guides for the Focus Group 2 and focused on the delivery method the participants would like for a comprehensive caregiver education program.

Results: Three themes were identified from Focus Group 1: a) understanding autism from cause to intervention, b) learning behavioral principles and techniques, and c) support for caregiver mental health. Two themes were identified from Focus Group 2: considerations for accessible language and cognitive load, and the importance of case examples and modeling.

Conclusions: We integrated caregivers into the pre-development process of caregiver education materials and attempted to equalize the power imbalance between researchers/professionals and caregivers. The three identified themes related to the content of online caregiver education programs serve as a window reflecting a preliminary view of current services for autistic children and their families. Accessibility of information also emerged as a crucial factor for caregivers. This underscores the need to provide caregivers with definitions and the historical backgrounds of some of the medical or Western-originated terms to increase caregiver self-efficacy. Another notable finding was that the participants asked for increased modeling emphasized by the shortage of quality practitioners in autism intervention.

**401.070** Creating a Community of Support for Black Parents of Autistic Individuals

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Background: To date, autism literature has narrated the many barriers experienced by Black caregivers of autistic individuals as they navigate receiving care for their child. Some of these barriers include the stress and racial trauma that families face, including racial microaggressions from providers, racial discrimination, and challenges accessing resources and services (Onovbiona et al., 2023; Weitlauf et al., 2023). In addition, Black caregivers also report experiencing poor support from families and community members due to differences in beliefs about autism in their community (Drame et al., 2020; Onovbiona et al., 2023). Few interventions and services have leveraged Black cultural strengths, including social support, story-telling, and collective activities (Johnson & Carter, 2020; Kaiser et al., 2022). Indeed, Black caregivers of autistic youth call for more support: "I think we do need more of our own support groups because a lot of times when you get the diagnosis, your family isn't gonna rally around you" (Onovbiona et al., 2023; p.10).

Objectives: The present study explored if participation in a culturally-informed support group led to changes in caregiver empowerment and stress.

Methods: To address this gap, we piloted a 5-session virtual support group for caregivers raising Black autistic individuals ($N=7$) that incorporated storytelling, communalism, and collectivistic service-driven activities centered around better care for Black autistic individuals. Surveys and interviews were used to assess for changes in parental stress, empowerment, healing of racial trauma, and satisfaction of the support group.

Results: By the end of the support group, caregivers demonstrated significant reductions in parental stress, ($t(5) = 4.716, p = .003$) and gains in perceived empowerment ($t(6) = -2.230, p = .034$). Qualitative findings highlighted the areas of the support group that contributed to caregiver satisfaction (e.g., connection, solution-focused components). Time was noted as a prominent barrier.

Conclusions: The study provided preliminary evidence that utilizing a culturally responsive support group could reduce caregiver stress, increase empowerment, and promote racial trauma resilience among caregivers raising Black autistic youth.

401.071 Depressive and Anxiety Symptoms Among Parents of Autistic Children: Results from a Large Cohort in China

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Background:

Parents of autistic children are at an increased risk for depression and anxiety, with variations in risk observed across regions and cultures. However, evidence on the prevalence and correlates of these symptoms in parents of autistic children in China remains scarce.

Objectives:

This study aims to describe the prevalence and correlates of depressive and anxiety symptoms in parents of autistic children within a large Chinese ASD cohort.

Methods:

Children diagnosed with ASD were drawn from the Shanghai Autism Early Development study (2015–2023). Diagnoses were made according to the DSM-5 criteria and confirmed via the Autism Diagnostic Observation Schedule (ADOS). Depressive symptoms in parents were measured using the Patient Health Questionnaire-9 (PHQ-9), and anxiety symptoms were measured using the Generalized Anxiety Disorder 7-item (GAD-7) scale. A total score >4 on either scale indicated the presence of symptoms, while a score >9 indicated moderate to severe symptoms. Autism severity in children was measured by ADOS scores. All assessments were performed at the time of diagnosis. Spearman's correlation tests were used to examine associations between parental depressive and anxiety symptoms and children's characteristics.

Results:

The cohort included 2,091 eligible autistic children, aged 2–15 years (mean 4.7 years; 85.2% male). Among them, 960 parents (45.9%) reported depressive symptoms, with 298 (14.3%) experiencing moderate to severe symptoms. In a subsample of 518 children with data on both parents, 112 (21.6%) had both parents reporting depressive symptoms. A total of 1,047 (50.1%) parents reported anxiety symptoms, with moderate to severe anxiety present in 327 (15.6%) parents. In the subsample of 516 children with complete data on both parents, 130 (25.2%) had both parents reporting anxiety symptoms. More severe autistic symptoms and lower family income were significantly associated with higher levels of depressive symptoms (all $P < 0.001$), while children's sex and age at diagnosis showed no significant association with parental mental health.

Conclusions:

Parents of autistic children in this large Chinese cohort demonstrated a high prevalence of both depression and anxiety. Increased social support for these families could help improve their overall well-being.

401.072 Designing Targeted Trainings and Resources to Improve the Primary Care Experience for Autistic Individuals through Qualitative Stakeholder Feedback

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Background: A high-quality medical home is an essential component of care for patients with autism spectrum disorder (ASD) however, pediatric primary care providers (PCPs) do not receive enough training to adequately support these patients and families (Badgett et al., 2023; Hine et al., 2019; Todorow et al., 2018). To address this gap in provider knowledge and training, our team is developing ASD-specific learning modules that integrate electronic health record (EHR) templates for use in primary care visits. As part of our stakeholder-informed process, we conducted focus groups with adults with lived experience related to ASD care within primary care settings.

Objectives: Our objective was to inform the development of PCP-focused trainings and tools to improve healthcare delivery for individuals with ASD across the lifespan and continuum of care — specifically: 1) post-diagnostic care coordination, 2) special-education planning and advocacy, and 3) transition-age planning and resources — and to examine stakeholder's perceived barriers, facilitators, and contingent factors to the implementation of the proposed trainings and tools. Further, we sought to identify key moderators of success for implementation of the training and proposed practice recommendations.

Methods: Psychologists on the study team conducted two one-hour focus groups for each of three stakeholder groups: providers ($n = 8$), caregivers ($n = 8$), and self-advocates ($n = 12$) using a semi-structured interview guide (Hennink et al., 2019). The virtual focus groups were recorded, transcribed, and coded. A unique, hierarchical coding system was developed and refined based on preliminary transcript review. Three members of the team double coded the first manuscript to establish reliability and reach consensus on coding procedures. The study team used an iterative inductive-deductive qualitative approach to analyze the data and identify a list of themes and subthemes (Fereday & Muir-Cochrane, 2019).

Results: Stakeholders identified a range of distinct, yet interconnected barriers, facilitators, and contingent factors to the successful implementation of the proposed visit types, trainings, and tools. Barriers identified throughout the groups were primarily logistics and knowledge based. Provider “expert syndrome” also emerged as a key disadvantage in receiving quality primary care. The facilitators that emerged from the six focus groups centered around resource availability to both providers and caregivers. Self-advocates also highlighted facilitators such as accommodations in medical settings and the importance of including autistic perspectives in training development and delivery. Many contingent factors also emerged from these conversations, factors that could contribute to visits going well or poorly. Overarching themes for the contingent factors revolve around the importance of trust and acceptance in a primary care relationship.

Conclusions: The themes highlighted in this study will be used to refine our existing training curriculum, develop an accompanying implementation guide, and create EHR templates for PCPs to use during visits with autistic individuals and caregivers. Our ultimate goal is to package, disseminate, and test this system on a larger scale. If successful, this program could provide PCPs with critical skills related to ASD care, leading to expedited family engagement with intervention and transition supports.



401.073 Development and Evaluation of a Training in Autism and Multilingualism for Providers: A Mixed Methods Randomized Controlled Study

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Background:

Autistic children from heritage-language speaking homes (hereafter referred to as *multilingual autistic children*, in alignment with a strengths-based framework) are a historically marginalized population in the U.S. that would benefit from receiving tailored evidenced-based support from providers who implement culturally and linguistically affirming care. Previous research found that multilingual providers who support multilingual autistic children reported significant challenges, including the lack of translated resources and professional development (PD), which negatively impact their ability to provide high-quality multilingual care. This is a major area of inequity that needs to be further explored.

Objectives:

The purposes of the present mixed-methods study were to (a) gain a deeper understanding of the knowledge, experiences, and needs of behavior analyst leaders related to supporting multilingual staff, (b) measure the impacts of a one-hour asynchronous PD on providers' knowledge, self-efficacy, and attitudes related to supporting multilingual autistic children and the multilingual staff who support them, and (c) to understand how qualitative findings helped to develop an effective PD and how did the social validity data help to enhance our understanding of randomized waitlist control trial (RCT) results using meta-inferences.

Methods:

This study used an exploratory sequential mixed methods design to address the research questions. Phase one (P1) included qualitative data from focus groups and interviews to understand the needs and perspectives of behavior analyst leaders with experience supporting multilingual staff. P1 was analyzed using reflexive thematic analysis and a critical theoretical framework. Phase two (P2), a waitlist RCT, measured the effectiveness of a PD module tailored based on the needs and perspectives identified in P1. P2 analysis involved calculating composite scores across the three measures (i.e., knowledge, self-efficacy, and attitude scales) compared across groups (intervention and control) using MANOVA. Lastly, descriptive statistics from the social validity questionnaire were calculated, and open-ended responses were analyzed qualitatively.

Results:

In both P1 and P2, diverse behavior analysts from across the U.S. participated, including monolingual, multilingual, autistic, and non-autistic individuals. In P1, participants (N=14) reported experiences and needs that echoed those of multilingual behavior analysts from extant research (e.g., needing more bilingual support and training for staff). P1 findings were integrated to build the PD, resulting in careful attention to include needs reported by monolingual and multilingual behavior analysts. In P2, RCT results demonstrated a statistically significant increase in participants' (N=90) knowledge ($p = .007$) and self-efficacy ($p = .034$) after participating in the PD, but no significant changes in attitudes ($p = .095$). Finally, a joint display illuminates additional meta-inferences.

Conclusions:

Improving our understanding of the needs and experiences of professionals who greatly impact autistic children's learning environments is important for developing PD to promote equitable practices that honor diverse linguistic backgrounds. This study found that tailored PD could improve behavior analysts' knowledge and self-efficacy toward supporting multilingual autistic children, their families, and the professionals who support them. More research and PD are needed to improve autism providers' practices to increase autistic children's access to learning new or maintaining heritage languages.



401.074 Development of a Conceptual Model of Preference of Japanese Autistic Adults: Comparison between the Perception of Autistic Traits within the Medical Model of Disability and Neurodiversity Affirmative Approach

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Background:

Autism has been conceptualized within the medical model as a deficit or disorder, influencing the nature of support, interventions, and societal perceptions. This deficit-focused perspective has contributed to adverse outcomes of autistic individuals, such as stigma, diminished self-esteem, and mental health problems. Recently, the neurodiversity paradigm has shifted the perspective toward a social model, interpreting autism as one of many natural variations in neurodevelopment. While neurodiversity underscores the diversity of human neurodevelopment, it does not fully elucidate positive autism identity.

Objectives:

This study aims to develop a conceptual model based on the preferences of Japanese autistic adults to better interpret autistic identity within the framework of the social model. The ultimate goal of developing this conceptual model is to create a questionnaire that assesses autistic preferences. This questionnaire will enable clinicians, caregivers, parents, and others involved with autistic individuals to understand the autistic preferences a person has. And it facilitates the provision of appropriate and supportive interventions that are congruent with the preferences of the autistic community.

Methods:

The study collected data from twenty-nine Japanese adults with diagnosis of autism by a medical professionals. Participants completed an online free-writing questionnaire with eight questions, which are related to autistic traits as described in the DSM-5-TR. To interpret underlying meanings of the data, we employed the reflexive thematic analysis recommended by Braun and Clarke. An autistic individual was involved in the research discussion to verify the clarity and appropriateness of the questions, ensuring that the study was aligned with the perspectives of the autistic community.

To enhance the depth and appropriateness of the conceptual model, we plan to conduct follow-up interviews. We are recruiting twenty-two of the original twenty-nine participants from the online survey, and aim to develop an improved conceptual model, which will be presented at the poster session.

Results:

We generated three main themes ("homogeneity", "stability", and "concreteness") and twelve sub-themes. Under "homogeneity", participants expressed a preference for spending time with individuals who share similar characteristics or who understand their unique traits. The theme of "stability" included sub-themes such as avoiding multitasking, requiring specific stimuli for concentration, engaging in patterned behaviors, focusing intensely on one thing, and so on. The "concreteness" theme encompassed sub-themes like purposeful actions, a reliance on visible information, and the need for clear task instructions. These themes collectively contribute to a conceptual model that interprets autistic identity based on the preferences of Japanese autistic adults.

Conclusions:

In this study, we confirmed some characteristics of autism noted in the DSM-5-TR. However, we also revealed new aspects of autism that are not fully explained by conventional understandings. Specifically, while the DSM-5-TR highlights "persistent deficits in social communication and social interaction," many participants with autism expressed a preference for spending time with friends, partners, and colleagues at work. This suggests that autistic individuals may seek social engagement under conditions that align with their preferences. These insights contribute to a more nuanced interpretation of autistic identity.



401.075 Development of the Japanese Version of the Affiliate Stigma Scale for Autism

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Background: The stigma of autism is a significant social issue with an impact that extends from autistic individuals to their close relationships, hence requiring thorough attention. Affiliate stigma refers to when parents of autistic children internalize such stigma, often owing to blame or criticism regarding their children's condition (Mak & Kwok, 2008). Parents experiencing affiliate stigma are more prone to psychological difficulties and social isolation, and such stigma can lead to negative parenting behaviors toward children (e.g., Hutchison et al., 2016).

Objectives: This study aimed to develop a Japanese version of the Affiliate Stigma Scale, originally developed by Mak and Kwok (2008), for parents of autistic children.

Methods: A survey was conducted in August 2024 with parents of autistic children (ages 3–18 years) using an online questionnaire. The Japanese version of the scale was translated by the second and third authors with permission from the original creators, and back-translated by a native English speaker. All items were adjusted for relevance to individuals on the autism spectrum. The Japanese version of the scale comprises 22 items rated on a four-point Likert scale.

Results: Study 1 The scale's factor structure was examined using data from 578 participants (mean age = 43.55 years, *standard deviation* = 5.70) using an exploratory factor analysis with robust maximum likelihood and oblique rotation. Results revealed a 16-item, three-factor structure, as follows: Avoidance Behavior (*Cronbach's α* = .87), Negative Cognitions (*Cronbach's α* = .89), and Negative Emotions (*Cronbach's α* = .87; see Table 1). Although the original scale had a single-factor structure, the three-factor model was retained because of its improved interpretability.

Study 2 Using confirmatory factor analysis and a sample of 298 participants (mean age = 43.60, *standard deviation* = 6.01), this three-factor model was evaluated for goodness of fit. The model demonstrated acceptable fit to the data (CFI = .940, RMSEA = .075, SRMR = .046).

Conclusions: A three-factor structure was found to be optimal for the Japanese version of the Affiliate Stigma Scale, distinguishing it from both the original scale and the three-factor model (i.e., encompassing cognitive, emotional, and behavioral dimensions) proposed by Chang (2016). These divergent results may relate to the scale developed by Mak and Kwok (2008) being focused on intellectual disabilities and having been analyzed using the principal factor method, whereas this study targeted autistic individuals in a Japanese context. Future research should explore the construct validity, test-retest reliability, and predictive validity of the Japanese version of the scale.



401.076 Developmental Regression in Children with Autism: Insights from Parental Reports in Rural Eastern India

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Background: In rural India, Autism Spectrum Disorder (ASD) poses significant social challenges, often resulting in isolation and stigma for families. Limited access to community support hinders the development of vital social skills in affected individuals, worsening their difficulties. Understanding the prevalence and onset patterns of regression in ASD is essential in these areas, where healthcare and early intervention are scarce. Analyzing socio-demographic factors, birth history, and psychosocial events can help identify at-risk children and develop targeted interventions. This information can also inform public health initiatives and awareness campaigns, enhancing support for families impacted by ASD.

Objectives: This study aims to assess the prevalence and patterns of developmental regression in children with ASD while exploring potential correlations with socio-demographic factors and early life events. The findings will contribute to a better understanding of regression in ASD, informing clinical practices and future research directions.

Methods: We evaluated 188 children, aged 1-10, diagnosed with ASD based on DSM-5 criteria. The Modified Checklist for Autism in Toddlers (M-CHAT) was used for initial screening, followed by the Developmental Screening Test (DST) and Childhood Autism Rating Scale (CARS). Data were analyzed using SPSS version 22. In addition to the screening assessments, demographic data such as age, gender, birth history, and socioeconomic status were collected through parent interviews and questionnaires. Ethical approval for the study was obtained from the institutional review board, and informed consent was secured from the parents of all participating children before data collection.

Results: According to parental reports, 60.2% of the sample exhibited developmental regression, marked by the loss of both language and social skills. Among these children, 70% experienced regression before the age of 24 months, suggesting a critical window for intervention. No statistically significant differences were found in cognitive ability and autism severity between children with and without regression. Additionally, 25% of the children demonstrated a developmental plateau, where skills remained unchanged for an extended period. The study identified four distinct patterns of onset for ASD: pure delay, developmental plateau, delay with regression, and pure regression, with 15% of the sample classified under pure delay and 5% under pure regression, indicating the variability in symptom presentation among affected children.

Conclusions: The prevalence of regression observed in this study exceeds that of existing literature. The mean age of regression onset was found to be between 12-25 months, often preceded by medical or psychosocial events. Furthermore, these findings underscore the need for heightened awareness and early screening in pediatric populations to facilitate timely interventions. Addressing these regressions promptly could potentially mitigate their long-term impact on development and overall functioning.

401.077 Diagnostic Disclosure in Job Interviews: Experiences of Autistic Adults in Canada

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Background:

Previous research has found that many autistic adults are uncomfortable disclosing their autism diagnosis to others due to autism stigma and potential discrimination (Thompson-Hodgetts et al., 2020). Stigma towards autistic youth may decrease following diagnostic disclosure in school settings (White et al., 2020); however, few autistic adults disclose their diagnosis to employers or educators (Huang et al., 2022). Autistic adults face greater unemployment than non-autistic adults, possibly due to insufficient support in the workplace (Hedley et al., 2018). Challenges specific to the job interview process may also contribute to lower rates of employment among autistic adults (Whelpley et al., 2023), and it is theorized that diagnostic disclosure may act as a facilitator (e.g., improve accommodations) or barrier (e.g., increasing discrimination) to job interviews with autistic adults.

Objectives:

The aim of this study was to understand the experiences and perceptions of Canadian autistic adults regarding disclosure of their autism diagnosis during job interviews.

Methods:

Interviews were conducted with 23 autistic adults (11 male, 6 female, 6 gender expansive) age 19 to 59 years, over Microsoft Teams ($n=11$) or through typed responses on Qualtrics ($n=12$). Participants were recruited on social media and through Canadian autism service providers. The interview protocol was created with a community-based research team comprised of an autistic adult with related lived experience, a non-autistic psychologist with experience supporting autistic adults with vocational development, and three non-autistic researchers. Questions specific to diagnostic disclosure were asked to all participants, who provided as much or as little as they felt comfortable sharing. An Interpretive Phenomenological Analysis approach was undertaken with Braun and Clarke's (2006) thematic analysis procedure to inductively generate codes and themes from the interview data. Participants also completed the Autism-Spectrum Quotient (AQ) and a demographics questionnaire (see Table 1).

Results:

Seven themes were generated from the data: (1) Autism Stigma and Discrimination, (2) Disclosure Improves the Experience, (3) Be Selective with Disclosure, (4) Disclosure is Challenging, (5) Disclosing Traits, Not Diagnosis, (6) Disclosing out of Necessity, and (7) Disclosure is Not Important. See Table 2 for themes, subthemes, and descriptions of themes.

Conclusions:

The findings highlight the complex reality of diagnostic disclosure in job interviews for autistic adults. Certain participants viewed disclosure as necessary to explain their autistic traits (e.g., interpersonal challenges) and to get access to accommodations for the interview. Others indicated that they fear, or have experienced, discrimination because of their disclosure. Many participants indicated that they preferred disclosing specific traits or "preferences" (e.g., "I need clear verbal communication") or disclosing only to specific employers, though it was reported by participants that there are few acceptable opportunities to disclose their diagnosis in a way that felt comfortable. Employment service providers for autistic adults should consider both the potential benefits and risks of disclosure, and workplace training to reduce stigma and discrimination. This may provide a safer environment for disclosure and accessibility for autistic job applicants. Furthermore, normalizing interview accommodations (e.g., 1-on-1 interviews, receiving questions in advance) could reduce the need to disclose in an interview altogether.



401.078 Does Participation Matter: The Implications of Educator Participation in Virtual-Based Remaking Recess Coaching on Self-Rated Fidelity

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Background: Remaking Recess (RR) is an evidence-based practice (EBP) that supports autistic students' peer engagement at school (Kretzmann et al., 2015). Repeated trials of RR have found it improves social outcomes for autistic elementary aged youth (Locke et al., 2018; Shih et al., 2019). Although RR coaching typically occurs in person, the study team pivoted to virtual-based coaching and self-rated outcome measures during the COVID-19 pandemic to adhere to social distancing guidelines. Past studies suggest that online EBP coaching may be as effective as in-person coaching (Mallonee et al., 2017; Piffner et al., 2022), but may vary based on the online coaching design and complexity of the intervention (Olson et al., 2021).

Objectives: This study examined the relationship between educators' participation and engagement in virtual-based coaching and their self-rated RR fidelity. Previous RR studies have demonstrated that educators who received in-person RR coaching achieved an average of 83.5% self-rated fidelity (Locke et al., 2019), but it is unclear whether virtual-based coaching will achieve the same. We hypothesize that virtual-based coaching will support educators' learning of RR content and skills, and educators who are more participatory during coaching will have higher self-rated fidelity after coaching ends.

Methods: One hundred sixty-four educators (average age = 36.8 years, SD = 12.7 years; 76.2% female) from 44 elementary schools across the United States and Canada participated in RR. The ethnic breakdown was 40.2% Hispanic. The racial breakdown was 41.5% Other, 36.0% White, 13.4% Black, 6.1% Asian, 1.8% Multiracial, and 1.2% Native American. Educators received 60-to-90-min group coaching in RR over Zoom across 6 to 12 sessions. Educators were asked to self-rate RR fidelity at three time points in the study (baseline, midpoint, and exit). Educators received \$25 for each data collection time point. Six masked coders rated educators' participation in recorded coaching sessions at three time points - initial, middle, and final. The highest of the three participation ratings was used in the data analysis as it was the most accurate assessment of participation. Participation data coding is ongoing and will be completed by December 2024.

Results: We conducted a preliminary Spearman's Correlation on 52 of the 164 educators. The analysis revealed a moderate positive correlation ($r=.49$, $p=.001$) between educators' highest attained participation rating and their self-rated RR fidelity after coaching ended. Subscales of self-rated fidelity for the Transitions, In Vivo Social Skills, and Peer Conversations modules of the RR curriculum also were significantly correlated with educator participation scores.

Conclusions: Our preliminary analyses show a significant relationship between educators' coaching participation and their self-rated fidelity after coaching ends. While we recognize the limitations of virtual-based coaching and self-rated fidelity, these were necessary pivots due to COVID-19 restrictions that allowed us to disseminate and implement RR more widely. Additionally, the self-rated fidelity measure provided pivotal insight into educators' use and implementation of RR in the context in which autistic children are served (Locke et al., 2022). The results indicate future considerations around RR coaching structure to increase educators' confidence, fidelity, and application of the intervention.

401.079 Does Self-Compassion Moderate the Relationships between Loneliness and Depressive Symptoms in a Global Sample of Autistic and Non-Autistic Adults?

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Background: Self-compassion involves treating oneself with kindness, understanding, and support, especially during difficult moments in life. Neff conceptualized self-compassion as comprising six subdomains: mindfulness, self-kindness, common humanity, over-identification, self-judgment, and isolation. Research consistently demonstrates that cultivating self-compassion can improve mental health, psychological well-being, and emotion regulation in non-autistic samples. Emerging evidence suggests that actively cultivating self-compassion can have a positive impact on the mental health of Autistic adults. The next important step is exploring how self-compassion influences mental health by interacting with other relevant factors, such as loneliness, to identify the mechanisms of change. In Autistic adults, loneliness is positively correlated with depressive symptoms. Self-compassion may mitigate the adverse effects of loneliness by fostering a more supportive internal dialogue. Recent evidence from non-autistic samples supports this notion. Given how Autistic adults self-report higher levels of loneliness, investigating whether self-compassion can reduce the impact of loneliness on depression is a pressing area of research.

Objectives: To examine the moderating effect of self-compassion on the relationship between loneliness and depressive symptoms in a global sample of Autistic and non-autistic adults. It was hypothesized that both positive (mindfulness, self-kindness, common humanity) and negative (over-identification, self-judgment, isolation) aspects of self-compassion would moderate the associations between loneliness and depressive symptoms in both groups.

Methods: 416 Autistic ($M_{age}=41.14$ years, $SD_{age}=13.30$) and 104 non-autistic adults ($M_{age}=41.39$ years, $SD_{age}=12.27$) completed questionnaires assessing loneliness (Adapted UCLA Loneliness Scale), self-compassion (Self-Compassion Scale), depression (Patient Health Questionnaire-9).

Results: When controlling for demographic factors, negative self-compassion had a statistically significant main effect on depression in both Autistic and non-autistic adults ($\beta=.31$, $p<.001$ and $\beta=.42$, $p<.001$, respectively). Furthermore, the effect of loneliness on depression was statistically significantly moderated by negative self-compassion in non-autistic adults ($p<.001$). For non-autistic participants with low negative self-compassion (<1 SD), loneliness had a small effect on depression ($\beta<.22$). For those with an average level of negative self-compassion, loneliness had a moderate impact on depression ($\beta=.39$). As for those with high negative self-compassion (>1 SD), loneliness had a large effect on depression ($\beta>.56$). In contrast, self-compassion did not significantly moderate the relationship between loneliness and depression in Autistic adults; for this group, loneliness had a statistically significant main effect on depression ($\beta=.31$, $p<.001$). Positive self-compassion had no significant main effect on depression and did not moderate the relationship between loneliness and depression in either participant group.

Conclusions: Our findings show that self-compassion moderates the relationship between loneliness and depressive symptoms in non-autistic adults but not in Autistic adults. With the growing interest in understanding the loneliness experiences of autistic individuals, these findings have critical implications for the development of loneliness interventions to support Autistic adults. Specifically, self-compassion may not play an essential role in mitigating the deleterious mental health effects of loneliness.

401.080 Does the University Sensory Built Environment Meet the Needs of Neurodivergent Students, Including Autistics? an Exploratory Approach Using Multiple Case Study

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Background:

Education is key to individual and social advancement, economic growth, and human development. It affects our abilities, values, and perceptions. Acquiring academic knowledge is only one aspect of education. It develops diverse skills, including critical thinking, problem-solving, creativity, and communication (Paul & Suleman, 2005). In 2022, Canadian post-secondary institutions welcomed over 1.4 million students, including more individuals with disabilities from the neurodivergent and autistic community. Individuals with neurodivergence and autism process sensory information differently from the typical population. This difference in sensory processing leads to more stimulation when navigating non-accommodating environments (Kern et al., 2006; Lai et al., 2011). The built environment may evoke feelings of unpredictability, hostility, and fatigue (Ashburner et al, 2013). Neurodivergent students are less able to engage with academic activities because of the sensory environment at the university (Morgan, 2019).

Objectives:

To document the lived experiences of neurodivergent students, including autistic students, regarding the built environment's barriers to their academic participation.

Methods:

An autistic researcher conducted walking interviews and individual semi-interviews with eight neurodivergent students, including autistic students, enrolled in an undergraduate program. The interviewer inquired about the participants' experiences with the university's physical environment. The interviews were subjected to an inductive reflexive thematic analysis.

Results:

: Four primary themes were identified: lighting, vision, acoustics, and temperature. The participants indicated that the brightness, particularly due to the use of fluorescent lighting, flickering lights, or neon, constituted a barrier to their concentration and attention. Secondly, visual distractions, such as individuals moving around the table during small group work sessions or observing individuals outside the windows, and visual overload, such as the presence of numerous posters on the walls, were identified as negatively impacting attention in the classroom. Thirdly, noise, particularly in the classroom, cafeteria, and corridors, negatively impacted attention and comprehension of the task. These auditory disturbances include reverberations within the enclosed spaces, the sound of ventilation systems, and the voices of fellow students. Additionally, the temperature within the classroom, study hall, or cafeteria was frequently either excessively warm or cold, often causing discomfort. These sensory impediments, as reported by neurodivergent students, including autistic students, negatively impacted their on-campus experience, leading to feelings of anxiety, fatigue, a sense of inadequacy, or even burnout.

Conclusions:

Education must consider the needs of all students, including those from the autistic community, to facilitate their advancement. The study reveals the hurdles neurodivergent and autistic students encounter, especially regarding their educational environments. Barriers to neurodivergent and autistic students' learning include lighting, vision, noise, and temperature. They are more than mere inconveniences: they impede learning and wellbeing. To foster truly inclusive education, it is essential to adapt the built environment to create a learning-friendly campus for all. This requires increased awareness, specific accommodations, and collaboration between educational establishments and neurodivergent communities, including autistic community. By recognizing and responding to the unique sensory needs of neurodivergent and autistic students, we can enhance their academic experience and enrich the diversity and richness of contributions within the academic community.

401.081 Double Burnout: Exploring the Experiences of Autistic and Educator Burnout Among Autistic Educators in the United States

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Background:

Autistic educators have the unique position of experiencing teacher burnout in addition to autistic burnout. Autistic burnout, “*a syndrome conceptualized as resulting from chronic life stress and a mismatch of expectations and abilities without adequate supports*”, when compounded with teacher burnout can lead to further loss of skills affecting mental health, physical well-being, and job performance. Current research has examined autistic-specific stressors, increased reported ACE’s for neurodivergent individuals, and general experiences of autistic educators, without specifically addressing the intersection between autistic burnout and burnout experienced by educators. This lack of understanding about the relationship between autistic burnout and educator burnout can have dangerous implications for the mental health and wellbeing of autistic educators. Research shows that individuals experiencing autistic burnout are at higher risk for experiencing trauma and suicide, the second leading cause of death among autistic adults. No studies yet explore how autistic educator burnout compounds or affects that risk or how it affects an autistic educator’s physical health and well-being.

Objectives:

1. Promote the inclusion and participation of Autistic Community Partners by co-creating and co-producing research through emancipatory participatory research design.
2. Explore experiences of Autistic educators who have left the field due to Autistic burnout and educator burnout to understand the interaction and interconnection of the two phenomena on mental health and wellbeing.
3. Determine a set of recommendations to support Autistic educators’ mental health and wellbeing through preventing and reducing the negative impacts of Autistic and educator burnout.

Methods:

Through emancipatory community-based participatory research design, in collaboration with five Autistic Community Partners, the research team interviewed five Autistic educators who had left the field of education and identified as being sexually and gender diverse (SGD) about their experiences with burnout, flourishing, mental health, and quality of life. Reflexive and template thematic analysis were used to understand the differences between Autistic and educator burnout, barriers and facilitators to Autistic mental health and flourishing, and recommendations to support Autistic mental health. Six themes were co-constructed by the research team and then sent back to the Autistic educators for review and member checks.

Results:

Results indicate that Autistic and educator burnout are separate but intertwined phenomena that deeply affect the mental health and wellbeing of Autistic educators even after leaving teaching. Six themes indicated by Autistic educators included sensory experiences, people and interactions, agency, climate and culture, environmental factors and embodied Autistic identity.

Conclusions:

Recommendations provided by Autistic educators included rejecting neuronormative and heteronormative standards in education, creating neuroinclusive spaces that allow all educators to feel psychologically safe, and fostering spaces for Autistic flourishing within school environments. Future research can use these recommendations to explore sustainable ways to promote Autistic flourishing and mitigate barriers to educator mental health.

401.082 Early Evaluation of a Community Engagement Toolkit’s Effectiveness in Supporting Caregivers of Neurodiverse Children to Access Screening and Care in India

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Background:

Neurodevelopmental disorders (NDDs) are a significant global health concern, particularly in South Asia, which bears the highest prevalence of NDDs globally, contributing substantially to disability-adjusted life years. Early detection is crucial for bridging care gaps, supporting family adjustment, and maximising a child's developmental potential. The NAMASTE (Neurodevelopment and Autism research in South Asia Treatment and Evidence) program developed a community-engagement toolkit with nine multimedia materials to increase community knowledge of NDDs and enhance caregiver engagement with an NDD detection and care pathway in four districts of India, Sri Lanka, and Nepal. This paper presents insights from an early evaluation of the toolkit disseminated by non-specialist health and care workers (NHCWs) in North Goa and East Delhi, India.

Objectives:

This study aimed to:

1. Explore barriers and facilitators for NHCWs in distributing and using awareness posters, a child developmental milestone calendar, and an identification card during community screenings for NDDs.
2. Understand caregivers' experiences with the patient education materials provided at different stages of the NAMASTE program.

Methods:

A convergent parallel mixed-methods design was used, with data collected from 160 NHCWs who conducted NDD screenings and 120 caregivers who participated in screening questionnaires in East Delhi and North Goa. Purposive sampling was employed to gather qualitative and quantitative data through: (i) focus group discussions (n=12 NHCWs), (ii) semi-structured interviews (n=12 caregivers), and (iii) surveys (n=160 NHCWs, n=120 caregivers participating in NDD screening, and n=30 caregivers enrolled in the intervention). Data collection tools included self-designed surveys and interview guides.

Qualitative interviews and discussions were analysed using content analysis and quantitative data using cross tabulation analysis and descriptive statistics. The findings from the qualitative and quantitative analysis were compared and contrasted to corroborate the final set of interpretations for the study.

Results:

Preliminary results suggest that NHCWs encountered logistical barriers when distributing and using the toolkit materials during community screenings. However, they recognised their value in improving community knowledge about early childhood development milestones. Caregivers shared positive experiences of using the patient education materials. Many reported increased knowledge about early signs of NDDs and feeling reassured after an NDD detection. NHCWs expressed a need for continued training to use the toolkit effectively and caregivers requested additional materials in to further support their child's developmental progress.

Conclusions:

The early evaluation of the community-engagement toolkit within the NAMASTE program demonstrates its potential to enhance awareness and early detection of neurodevelopmental disorders among caregivers and non-specialist health and care workers in India. The toolkit materials improved caregivers' understanding of developmental milestones and increased their engagement with the detection-care pathway. However, barriers related to accessibility and the need for additional information were identified. Addressing these challenges will be essential for scaling the intervention and ensuring its effectiveness in diverse settings.

401.083 Echo Autism Hawai'i: Outcomes of a Pilot Program for Supporting Autism Providers in Family-Centered Care

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Background: As the prevalence of autism grows, the need for comprehensive support and services increases, especially in rural, remote, and underserved areas. In Hawai'i, disparities in access to services for racial and ethnic minorities, combined with the state's geographic isolation as an island chain, exacerbate these challenges. There is a pressing need for effective sharing of knowledge and resources for autism service providers across the islands.

Objectives: Project Extension Community Healthcare Outcomes (ECHO) has proven to be an effective model for disseminating best practices for various medical and mental health conditions. This pilot study assessed the feasibility and acceptability of applying the ECHO framework to deliver family-centered care didactics and resources to autism service providers across Hawai'i.

Methods: The ECHO Autism Hawai'i program was implemented with fidelity to the original ECHO model, incorporating minor adaptations for local needs. Four 90-minute Zoom sessions were conducted biweekly, each featuring a didactic presentation from an expert in the field, a de-identified case presentation by an ECHO member, and a group discussion. Sessions focused on key aspects of family-centered care, including Introduction to Family-Centered Care and Engagement, Early Childhood/Diagnostics, School-Aged Support, and Transition Age Services, addressing the diverse needs of families at various stages of care. Participants completed satisfaction surveys following each session, including feasibility and applicability, and a post-program survey evaluated the overall acceptability and perceived impact of the program.

Results: Twenty-two service providers participated in the pilot, including clinical psychologists, speech-language pathologists, early interventionists, and special education teachers, with an average of 13 participants per session. Surveys administered after each session indicated that participants consistently agreed that the strategies discussed were feasible and acceptable to implement and that their knowledge of the session topics increased. Participants reported that each didactic presentation was informative, engaging, and easy to understand. Post-program surveys revealed unanimous satisfaction with the program, with participants expressing that the ECHO Team created a supportive learning environment where participants felt comfortable sharing ideas. Additionally, most respondents strongly agreed that their knowledge of family-centered practices for autism had increased as a result of the program.

Conclusions: The ECHO Autism Hawai'i pilot program was well received, with participants highlighting its potential to bridge service gaps for autism providers in geographically isolated and underserved areas. Given its success, additional cohorts are planned for Fall 2024 and Spring 2025, with expanded participation as well as follow-up with the first cohort. Additional data will provide further insight into the program's impact, with updated findings to be presented at the time of the conference. This program represents a promising solution for overcoming service barriers in rural and remote communities.

401.084 Measuring the Specific Behaviors of Proficient Autism Advocates

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Background:

Newly diagnosed autistic individuals and their family caregivers face a long list of tasks and recommendations provided by the diagnostic clinician. If diagnosed in an autism center, the center may also have a support person to help families and individuals navigate these recommendations. However, with the expansion of clinicians with diagnostic capabilities due to best practice training by ECHO Autism comes additional need for navigational support systems. In 2022, ECHO Autism Communities (EAC) began a program to fill in this gap with trained autism advocates taking on the role of Connector in the ECHO Autism Community Connections (EACC) project. Connectors were selected from the ECHO Autism: Advocates (EAA) program due to their ability to support newly diagnosed individuals and their families. To allow for continued expansion and the maintenance of a symbiotic relationship across diagnostic, advocate, and connector programs, we realized a metric for evaluating the readiness of advocates was necessary. In 2024, we began the process of creating a rubric to assess the level of proficiency an advocate has reached. This rubric would provide guidance for growth to the advocate and a measure for placement in a connector role.

Objectives:

- Identify and describe the knowledge, skills, and specific behaviors of proficient advocates
- Develop a rubric for measuring advocate proficiencies

Methods:

A consultant outside the three programs, but familiar with EAC and the creation of evaluation metrics, performed a meta-analysis of existing advocate proficiency research and developed a focus group protocol. The consultant and lead author held three focus groups with constituencies who had direct access to autism advocates. The three groups were: expert hub team members of the EAA program, EACC Connectors, and EAC leadership. Following the focus groups, the lead author and second author independently coded transcripts using an inductive qualitative analysis approach to categorize proficiencies and extrapolate examples of manifest proficiencies. We then created a rubric prototype for initial review by focus group members; we also asked EACC referring clinicians to review and provide input from their perspective. Following results of these reviews, we will modify the rubric and test it. Quality improvement methodology will be utilized to guide any further adaptations necessary before implementation within the ECHO Autism: Advocates program.

Results:

The first rubric iteration included 12 specific proficiencies within 4 categories: Knowledge, Communication Skills, Professionalism, and Personal Development and Mentorship. Each proficiency in the rubric would be rated on a multi-point scale from not proficient to proficient, with not applicable for situations where examples to demonstrate proficiencies were not possible. We are still collecting data from reviewers but anticipate having more results to share during this presentation at INSAR.

Conclusions:

Through February 2025, the rubric will be tested in real-time. Quality improvement methodology will guide the process of modifying the instrument to ensure consistency and objectivity in measuring proficiency in EAA participants.

401.086 Empowering Women of Color through Family Echo: Autism – Addressing Disparities in Care and Broadening DEIA Initiatives

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Background: Families of children with autism are key members of care teams and often the primary coordinators for their child's treatment. Despite calls for interdisciplinary training and collaboration across medical, education, and community systems, families typically receive very little education and training in autism, care coordination, or team-based care. Family ECHO: Autism adapted the Project Extension for Community Healthcare Outcomes (Project ECHO) model to build the knowledge and confidence of families raising children and adolescents with autism. The series provides access to interdisciplinary subject matter experts from a learning health network, autism resources, resource coordinators, and community connectedness to build care and treatment knowledge of families. A notable addition to this initiative is the Empowering Women of Color sessions, specifically designed to address the barriers and disparities faced by families of color when accessing autism care.

Objectives: The Empowering Women of Color series within the Family ECHO: Autism program focused on the lived experiences of women of color, addressing the unique barriers they encounter in accessing autism services for their children, and providing skills to enhance family empowerment and advocate for equity in healthcare. The series aligns with Diversity, Equity, Inclusion, and Accessibility (DEIA) efforts by ensuring that marginalized communities receive the support they need to improve outcomes for their children on the autism spectrum. Series strives to

- Increase self-efficacy in knowledge and confidence to care for children with autism.
- Build confidence in women of color to overcome barriers in managing care and treatment for children with autism.
- Connect to resources.

Methods: Sessions were developed in collaboration with a robust panel of women of color including mothers and professionals in autism. The existing Family ECHO Autism subject matter experts supported this effort. The sessions, conducted in two parts, provided participants with skills to navigate disparities in care and connected them with subject matter experts, peers with lived experience and resources. Interactive case discussions, and live Q&A segments promote a collaborative learning environment.

Results: From April 2020 to March 2024, the Family ECHO: Autism series engaged over 18,000 participants from 73 countries and all 50 U.S. states. Over 7,500 participants attended live sessions. Sessions are delivered in multiple languages with 93% of participants identifying themselves as mothers. Participant satisfaction is high, with an 86% approval rate, underscoring the program's success in addressing autism-related disparities for families of color. The Empowering Women of Color sessions led to a significant increase in participation among Black or African American families, rising from a standard attendance of 14.7% to 46.5% in the inaugural session.

Conclusions: The Empowering Women of Color series demonstrates how a targeted, culturally responsive approach can bridge the gaps in autism care and support DEIA initiatives within under-resourced communities. By broadening the reach of the Family ECHO: Autism platform, this program fosters empowerment, providing families of color with the tools to advocate for their children's care. Further expansions are planned to enhance outreach and support for more diverse populations, contributing to a more equitable healthcare landscape for all families impacted by autism.

401.087 Engaging Individuals with Lived Experience of Autism and Intellectual Disability to Create Community Awareness for Promoting Early Identification and Uptake of Intervention Services: A Scoping Review

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Background: Community-based health surveillance for early detection and intervention of neurodevelopmental disorders (NDDs) like autism and intellectual disability has increasingly received prominence in public health research. Community-based programs allow for more diagnostic opportunities, however, lack of awareness of child development, social support, and standardized practices in care pathways delay autism diagnoses and access to early intervention services. In response, research involving and engaging the community is important to facilitate trust, improve quality and access to care. There are programmes and synthesised literature on community engagement and involvement in intervention development for NDDs. However, there is no synthesized knowledge of practices to involve the lived experiences of autistic individuals and their caregivers in conceptualizing community awareness through the unique lens of autism specifically for promoting early detection and improving the uptake of services.

Objectives: This scoping review will aim to report on the community-engaged and/or involved research methodologies employed within community-based programs to create awareness by leveraging lived experiences to promote early identification and uptake of intervention.

Methods: PubMed, Scopus, Ovid and Web of Science were searched. Studies after 1980s were included to follow the advocacy movement following deinstitutionalization. These needed to involve autistic individuals and their caregivers, in conceptualizing awareness resources, and reporting on the use of resources toward early detection or intervention services. Studies were excluded if beneficiaries were above 18 and not in English considering costs of translation and time, and if they were purely biomedical studies. Four reviewers double-reviewed all abstracts in COVidence software, two reviewers were involved in extraction, and one to check data accuracy.

Results: 13254 abstracts were screened, of which 31 were identified for full-text review, 10 met eligibility, and 6 were included in this review. All 6 studies involved community members, specifically caregivers of autistic children and care providers, and one engaged autistic adults to identify knowledge gaps, needed information, and preferences for presenting information, i.e., content and format. The most used methods reported in 4 studies were collaborative partnerships through stakeholder consultations, advisory boards, and stakeholder committees. Majority studies (n=4) used semi-structured and unstructured interviews. One study used boot camp translations based on a community-based participatory research framework. Other studies (n=2) included focus group discussions and knowledge translations sessions. One study each used participatory design workshops, rapid prototyping workshops, kick-off meetings, conferences, and market analysis. 5 out of 6 studies were based in high-income countries (HICs), with 1 study in a low-and-middle-income country (LMIC).

Conclusions: Involving relevant stakeholders to create awareness resources promoting early detection and intervention are happening across disciplines like design research and public health. Researchers' use of key terms and definitions varies; hence, the process varies. This difference is also attributed to knowledge and resource gaps between HICs and LMICs. Future research may benefit from standardising community-engaged practices across community-based programmes, specifically, collaborating with LMICs to determine best practices keeping in mind cultural contexts.

401.088 Enhancing Inclusion and Support in the Hospital for Children on the Autism Spectrum: Experiences and Needs of Healthcare Staff

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Background: In a hospital setting, some patients on the autism spectrum may display challenging behaviors due to core difficulties involving communication, and sensory sensitivities during an anxiety-inducing period. Consequently, healthcare staff may encounter difficulty in caring for autistic patients, impeding effective care provision.

Objectives: The aim of this study was to explore the experiences and needs of healthcare staff when caring for autistic children, in order to identify ways to enhance inclusion and support in a pediatric hospital setting.

Methods: Focus group discussions (FGD) were conducted in a tertiary pediatric hospital, using a semi-structured interview guide. Participants were recruited from hospital staff using purposive sampling. The FGDs were recorded, transcribed and coded. Thematic analysis was subsequently conducted using NVivo 12.

Results: Twenty-one healthcare staff participated in the FGD (13 nurses, 5 doctors, 2 allied health professionals and 1 administrator). Five had worked in the hospital for <5 years, 6 for 5-10 years, and 10 for >10 years. Three had an immediate family member who was autistic. Findings highlighted the need to equip all healthcare staff with good communication skills for collaborative relationships to be effective, both in order to work in partnership with autistic children and their caregivers, as well as inter-professionally. Strategies and resources should also be taught to manage any externalizing behaviors exhibited by autistic children coming into a hospital setting. The impact of the hospital environment on patient experience, such as the design of the hospital or the need for an individualized 'hospital passport' for autism, and specialized management of medical/nursing procedures and devices, were also identified as key areas of need. Finally, there were significant conflicts of interest faced by healthcare staff when caring for children on the autism spectrum, such as between wanting to see to their individual needs, and yet having other patients to tend to and waiting times to adhere to.

Conclusions: The key themes identified from the study included: fostering collaborative relationships, improving multistakeholder communication, managing externalizing behaviors in a hospital setting, improving the healthcare environment, and managing conflicts of interest. Using these themes to effect change would hopefully enhance inclusion and support for children on the autism spectrum in the hospital setting.

401.089 Evaluating a Neurodiversity-Affirming Framework for STEM Workshops: Impact of Participatory Approaches on Staff Practices and Autistic Engagement

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Background: Autism intervention research traditionally focuses on reducing Autistic traits¹, often neglecting social validity—how acceptable and meaningful interventions are to those affected². The disconnect between controlled efficacy and real-world relevance has stimulated advocacy for neurodiversity-affirming and participatory frameworks that prioritize Autistic individuals' self-determination^{3–6}. We present a framework for evaluating a neurodiversity-affirmative approach to delivering STEM workshops, in which we co-create processes with Autistic individuals, focus on strengths over deficits, foster community diversity, respect all forms of communication, and ensure accessibility.

Objectives:

Within a STEM workshop for Autistic adolescents, evaluate impacts of:

1. Centering neurodiversity-affirming practices on staff practices and beliefs
2. Utilizing ongoing student feedback on engagement

Methods:

The research occurred in Years 2 and 3 of a three-year NSF-funded study to create and assess online game-design and employment workshops for Autistic youth⁷. The Year 2 workshop included 22 participants ($M_{age}=16.82$, $SD_{age}=2.24$), and Year 3 workshops included 36 randomized participants: Workshop 3a ($n=17$, $M_{age}=16.9$, $SD=2.6$) and Workshop 3b ($n=19$, $M_{age}=17.2$, $SD=2.3$). After some staff applied deficit-based approaches in Year 2, leadership and the participatory team redesigned staff hiring, training, and curriculum to center neurodiversity-affirming approaches in Year 3. Workshop alignment with neurodiversity-affirming principles was assessed through staff self-report and coding of recorded workshop sessions. Coders, masked to timepoints and research questions, achieved interrater reliability ($\kappa=0.88$, $p < .001$).

Across both years, students self-reported engagement to provide real-time, iterative feedback on workshop activities. During “advocacy check-ins,” students collectively considered feedback patterns to suggest workshop improvements. In Year 2, engagement surveys and check-ins were framed as research activities, while in Year 3, staff framed these as opportunities to practice self-advocacy.

Results:

Video coding revealed that Year 3 staff used neurodiversity-affirming practices more frequently than Year 2 staff ($F(2, 15) = 9.182$, $p = 0.002$; $\eta^2 = 0.550$), suggesting improvements following revised training and hiring practices. Open-ended staff responses revealed that Year 2 staff focused more on behavior management, while Year 3 staff reported using student-centered, strengths-based approaches, including student-made “diversity profiles.” Year 3 staff reported higher satisfaction with training, particularly in fostering student self-advocacy. Student self-reported engagement were analyzed using hierarchical ordinal regressions. No across-year engagement differences were observed. Year 3 students reported more interest at the second ($\beta = 0.99$, $p < .001$) and third advocacy check-ins ($\beta = 1.05$, $p < .001$) relative to the first across both workshops, while check-ins in Year 2 did not improve engagement.

Conclusions:

Results suggest systemic changes between Years 2 and 3 improved neurodiversity-affirming practices and student engagement. Developing comprehensive training improved educators' adherence to neurodiversity-affirmative principles and their satisfaction with training. Findings highlight how authentic participatory work can foster more inclusive educational approaches. When engagement ratings were not framed as advocacy tools (Year 2), check-ins did not improve engagement. However, training staff to explicitly empower students to advocate for their learning preferences enhanced student engagement (Year 3), highlighting how empowering Autistic students to shape their educational contexts can promote self-determination.

401.090 Evaluating the Feasibility and Efficacy of a School-Home Communication Intervention Among Families of Children with Autism

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Background: School-home communication is a critical factor in supporting the education and development of children, particularly those with autism. Effective communication strategies can lead to enhanced family involvement, better educational outcomes, and stronger family-professional partnerships (Flessa, 2008). However, research indicates that only half of all families with school-aged children receive any communication from their child's school (McQuiggan & Megra, 2017), and this communication is often not aligned with the needs and preferences of families, particularly those of children with autism (Azad et al., 2018). Therefore, there is a critical need for interventions that can improve communication between families and schools, specifically tailored to the unique needs of children with autism (Tucker & Schwartz, 2013). The proposed School-Home Alliance for Relationship Enhancement (SHARE) intervention seeks to address these gaps by offering a low-intensity, flexible, and evidence-based approach.

Objectives: The primary objectives for families and educators of children with autism are: (1) assess the efficacy of the SHARE intervention in improving satisfaction and quality of school-home communication; (2) evaluate the intervention's impact on family-professional partnerships; and (3) determine the feasibility and acceptability of the intervention.

Methods: The study will involve a convenience sample of family-educator dyads from various geographical regions in the United States. Eligibility criteria include families with a child with autism between the age of 3-21 years and educators who work with their children. The SHARE intervention, grounded in Bronfenbrenner's Ecological Systems Theory, consists of three virtual, one-hour weekly sessions, with engagement in interactive discussions, role-play activities, and the development of communication action plans using SMART goals.

The presurvey includes demographic items, a researcher developed measure on school-home communication, two established measures to evaluate communication and family-professional partnership, and an established measure to assess the child's autism severity and maladaptive behavior. The formative evaluations include four close-ended and three open-ended items to determine feasibility and usability of the intervention sessions. The post-survey will be comprised of the same measures as the pre-survey but without demographic items or child measures and additionally include an established measure to evaluate intervention acceptability.

Descriptive statistics will be calculated for pre- and post-intervention measure scores. Mixed-effects models will be used to assess the intervention's efficacy, controlling for baseline and child characteristics. Correlation analyses will be used to examine the alignment between family and educator ratings, and paired-samples t-tests will be conducted to evaluate changes in family-professional partnerships. Additionally, open-ended responses from the formative evaluations will be analyzed using the constant comparative method to identify themes related to feasibility and acceptability.

Results: The SHARE intervention is hypothesized and expected to enhance family-professional partnerships, improve school-home communication, and establish more consistent support for the child's development.

Conclusions: This study addresses a gap in existing literature by focusing on the nuanced aspects of school-home communication. The goal is to determine the SHARE intervention's impact on communication satisfaction, quality, and alignment, as well as on the quality of family-professional partnerships, hypothesizing positive outcomes and the intervention's feasibility for educators and families of children with autism.

401.091 Evaluating the Need for Autistic-Led Autism Instruction for Education Professionals

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Background:

Stereotypes about autism include functioning labels (i.e., high- or low-functioning) and are highly prevalent among lay people (Draaisma, 2009), as is stigma surrounding autism (Gillespie-Lynch et al., 2022). Educators have the power to dismantle stereotypes and reduce stigma (Gillespie-Lynch et al., 2022), by educating themselves about autism via structured trainings (Gillespie-Lynch et al., 2017, 2022; Waisman et al., 2023). Structured trainings can have a greater impact if delivered by autistic people, due to their firsthand experiences of autism (Gillespie-Lynch, 2017). It is important to include diverse autistic perspectives (e.g., non-speaking autistic people) in these trainings as well (Lebenhagen, 2020).

Objectives:

1. Explore education professionals' views on autism and experiences that shaped their views.
2. Evaluate impacts of a primarily autistic-led autism sabbatical program for educators.

Methods:

Thirty-seven education professionals signed up for a year-long autism sabbatical program that includes two 2.5 hour courses each term and a fieldwork component; twenty-eight professionals completed the survey. One student withdrew from the program. One track is on Monday, one on Wednesday. The Monday classes are taught by one autistic and one non-autistic instructor; the Wednesday classes by two autistic instructors. Students were assigned to each day without consultation. Instruction includes contemporary issues surrounding autism in education, diagnosis, and interventions. Responses were coded qualitatively by two independent coders. Students also completed weekly logs wherein they recounted key experiences in each class, including synthesis of similarities and differences in what they learned in each class, and a mid semester survey about their experiences so far. Coding of logs is ongoing but illustrative quotes are provided in Table 2.

Results:

All results are exploratory. See Table 1.

Participants who described autism as involving executive functioning ($p=.012$) and/or structural language difficulties ($p=.003$) were more likely to describe having a negative experience in the education system surrounding autism. Further analysis revealed that participants who defined autism as involving structural language difficulties ($p=.008$) reported not having enough training to effectively support autistic needs.

Participants who described special education settings having an impact on their perspectives on autism were more likely to describe autism as involving structural language difficulties ($p=.027$).

Participants who described their professional experiences impacting their understanding of autism were more likely to describe autism in terms of functioning levels or severity ($p=.022$) but were also more likely to describe autism as a positive difference ($p=.016$).

Conclusions:

Exploratory results indicate that education professionals require training on alternative communication methods used by autistic people to effectively support them in education settings.

Additionally, education professionals may be absorbing stereotypes about autism (e.g., Draaisma, 2009) as a result of their professional experiences.

Autistic people leading this program may be especially needed not only to train participants to effectively support autistic people's needs in education settings, but to help them dispel stereotypes about autism (Gillespie-Lynch, 2017; Lebenhagen, 2020).

Further research will involve coding participants' weekly journal logs and assignments completed throughout the semester. Weekly logs will show if instruction by autistic people impacts educators' views and understanding of autism.



401.092 Examining Racial and Socioeconomic Disparities in Autism Classifications in the Deep South

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Background:

Recent studies have shown that the rate at which autism is identified among children varies widely from state to state (Safer-Lichtenstein et al., 2020; Aylward et al., 2021). Factors that contribute to the variation in identification include socioeconomic status and state education policies. Historically, minority groups have exhibited lower diagnostic rates (Tromans et al., 2020). In recent years racial disparities in nationwide diagnostic rates have leveled out (Maenner et al., 2023). Given that Alabama's public education system currently ranks among the lowest in the country, we were interested in examining whether racial and socioeconomic disparities remain at the state level (McCann, 2024).

Objectives:

Determine whether race and socioeconomic status remain important predictors of autism educational classifications in the state of Alabama. Hypothesis: Percent of Black/African-Americans (%Black), percent with a Bachelor's degree (%Bachelors), and percent living below the poverty level (%Poverty) at the county level would predict percent of children with a special education classification of autism not yet in kindergarten (%Pre-K), as well as total number of autism cases (TotalASD) in each county.

Methods:

For each of the 67 county school districts, the total number of children ages 3-21 with an educational classification of autism were pulled from the 2023 Child Count report. The percent of children with an educational classification of autism between ages 3-5 (not yet in kindergarten) was then calculated. The %Black, %Bachelors, and %Poverty in each county were pulled from the U.S. Census data. IBM SPSS Statistics software (Version 28) was used to run descriptive statistics and multiple regressions.

Results:

In Alabama, 103,931 students are served within the special education system with 12,406 having an educational classification of autism ($M=114.81, SD=159.71$), and the mean %Pre-K is 5.40%. The mean %Bachelors is 19.13%, mean %Poverty is 18.42%, and mean %Black is 29.01% across all counties.

A multiple regression was run to predict %Pre-K from %Bachelors, %Poverty, and %Black. This model was significant ($R^2 = 0.117, F(3,63) = 2.771, p = 0.049$). The only significant predictor was %Poverty, which was a negative predictor ($p = 0.038$).

A multiple regression was run to predict TotalASD cases from %Bachelors, %Poverty, and %Black. This model was also significant ($R^2 = 0.507, F(3, 63) = 21.592, p < 0.001$). The only significant predictor was %Bachelors, which was a positive predictor ($p < 0.001$).

Conclusions:

In Alabama counties where there is a higher percentage of the population living below the poverty level, there is a statistically lower percentage of children ages 3-5 not yet in kindergarten who have been identified with autism. Additionally, in Alabama counties with higher educational attainment, there is a statistically higher percentage of children identified with autism. These findings illustrate that socioeconomic factors remain critical indicators of access to autism identification within schools. Targeted outreach efforts surrounding early autism identification are needed, particularly within low-income communities with low-educational attainment in Alabama. Future directions and limitations will also be discussed.

401.094 Executive Functioning Predicting Health Outcomes: A Dyadic Analysis of Parents with Autistic Children

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Background: Adverse outcomes, like increased stress, are common in parents given the demanding nature of their role (Nomaguchi, 2020). That said, parents of autistic children report particularly high rates of adverse health outcomes compared to their counterparts with neurotypical children or children with other developmental disorders (Dimachkie Nunnally et al., 2023). Parental executive functioning is one factor known to buffer such outcomes (Korucu et al., 2020), but research to date has only considered its role in individual parents, neglecting the bidirectional and interconnected nature of the parenting dyad (Zeng et al., 2021). Appropriate statistical methodology is needed to assess the viability of protective factors within the parenting dyad and promote positive health outcomes in parents of autistic children.

Objectives: The present study engaged in an exploratory dyadic analysis examining the influence of parents' executive functioning abilities (emotion regulation and inhibitory control) on parental health outcomes (anxiety, depression, parental stress, and well-being). Actor effects, the impact of parents' executive functioning on their *own* outcome variables, and partner effects, the impact of parents' executive functioning on their *partner's* outcome variables, were considered for anxiety, depression, parental stress, and well-being.

Methods: Sixty-three different-sex parenting dyads with a biological, autistic child from Simons Powering Autism Research for Knowledge (SPARK), a nationwide autism genetics study, completed online surveys. Data were analyzed using path analysis, guided by the Actor-Partner Interdependence Model (Cook & Kenny, 2005) to account for their non-independence. Four saturated models were run, one for each outcome variable (anxiety, depression, parental stress, and well-being) with emotion regulation and inhibitory control as predictor variables.

Results: Analyses indicated strong emotion regulation actor effects. Deficits in mother and fathers' emotion regulation predicted worsening personal anxiety, depression, parental stress, and well-being. Additionally, one partner effect was found, such that moms' worsening emotion regulation predicted dads' decreased well-being. Inhibitory control did not share the same predictive ability as emotion regulation aside from one finding -- worsening inhibitory control predicted lower well-being in fathers.

Conclusions: Parents' emotional regulation is a viable predictor of their own anxiety, depression, parental stress, and well-being, highlighting its potential as a protective factor against adverse health outcomes related to parenting an autistic child. This study gives insight into parental dynamics through the partner effect finding of moms' emotion regulation predicting dads' well-being. We posit this relates to moms' increased caretaking role within the family. As moms tend to be more involved in parenting and other family-related tasks, their ability to manage their emotions may have a greater impact on broader family functioning. Further, dads' well-being, overall, may be more sensitive to executive functioning challenges, which could explain our sole actor effect for inhibitory control. These results can be used to inform prevention and intervention efforts by emphasizing the importance of emotion regulation for parents of autistic children. They also highlight the importance of providing additional support to mothers around emotion regulation to minimize potential negative effects on personal and partner well-being.

401.095 Expectations of Puerto Rican Caregivers of Autistic Individuals Regarding Romantic Relationships

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Background: Many parents of autistic youth express a need for guidance in providing education on sexuality and romantic relationships, yet they may hesitate to do so if they do not anticipate that their child may develop sexual relationships (Holmes et al., 2015). Current data on parental expectations for their autistic children's ability to engage in romantic relationships is significantly limited within collectivistic and family-oriented societies such as Latino populations (Espinosa et al., 2020).

Objectives: The objectives were: (1) to describe the expectations of Puerto Rican caregivers of autistic individuals regarding romantic relationships and (2) to determine if a relationship existed between caregivers' expectations and the levels of support established for their child's autism spectrum disorder (ASD) diagnosis, as defined by the DSM-5-TR.

Methods: In this descriptive and correlational study, a convenience sample of 50 self-identified adult caregivers of autistic individuals, whose ages ranged from 5 to 34 years, was voluntarily recruited through social media flyers. Participants completed two instruments via REDcap: a sociodemographic questionnaire and a caregiver expectations survey, adapted and translated using a back-translation method, from Holmes et al. (2015) and Holmes & Himle (2014). The survey measured caregivers' expectations using a 5-point Likert scale where higher scores indicated higher expectations. Frequency analyses by premise were conducted on the survey data. For the second objective, a Shapiro-Wilk test confirmed a normal distribution, and a bivariate Pearson correlation analysis was performed.

Results: The majority of participants ($n=29$, 58%) believed it was likely or very likely that their child would experience sexual attraction. For romantic relationships, 23 participants (46%) saw some likelihood of their child going on dates, while 14 (28%) viewed this as unlikely or very unlikely. Regarding falling in love, 22 participants (44%) anticipated this possibility, compared to 12 (24%) who did not. When asked about healthy sexual relationships, 22 participants (44%) expressed likelihood, while 23 (46%) expected likelihood for marriage or finding a life partner. Finally, 23 participants (46%) expected their child to likely have children. Finally, a moderate negative relationship was observed between caregiver expectations and identified support levels for the ASD diagnosis, showing that higher levels of support in the areas of social communication ($r = -0.568$) and restricted interests and repetitive behaviors ($r = -0.459$) were associated with lower expectations regarding romantic relationships.

Conclusions: This study significantly contributes to the field of ASD in Puerto Rico by collecting quantitative data on caregiver expectations regarding the sexuality and romantic relationships of their autistic children. Despite the small sample size, the data revealed variability in caregiver responses which was related, in part, to the level of support required by their child's ASD diagnosis. Nonetheless, many caregivers reported high expectations, with consistency found across several premises in the Caregiver Expectations Survey, offering novel findings in comparison to previous studies (Holmes et al., 2015; Holmes & Himle, 2014). These insights have important implications for developing educational programs, support groups tailored to families' needs, public policies on sexual education and relationship guidance, and training for health professionals in this area.

401.096 Experiences and Well-Being of Rural Mothers That Have a School-Aged Autistic Child

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Background: Families with a child with autism spectrum disorder (ASD) who live in rural communities face many barriers to receiving care, including a lack of access to knowledgeable intervention (Murphy & Ruble, 2012) and primary care providers (PCP; Rhoades et al., 2007). Due to these barriers, these families must find ways to care for their children, often at a detriment to their own well-being (Ault et al., 2021). Caregivers from rural communities report overwhelming levels of stress (Hoogsteen & Woodgate, 2013), rate themselves poorly on measures of family quality of life (Higgins et al., 2005), and have poor social supports (Parsons et al., 2020). However, previous literature has only analyzed rural communities in comparison to urban communities or as a unitary group, but rurality is not a uniform geographic region and should be precisely defined (Danek et al., 2022).

Objectives: To explore how increasing rurality impacts healthcare delivery and subsequent caregiver well-being by interviewing caregivers of autistic children. It was hypothesized that caregivers from increasingly rural communities would report unique themes about their service providers (school-based interventions, outpatient interventions, and primary care) and endorse unique well-being themes in the areas of stress, quality of life, and social support.

Methods: Caregiver neighborhoods were categorized using census tracts defined by Rural-Urban Commuting Areas (RUCAs; Morrill, Cromartie, & Hart, 1999) that define rurality by population density, urbanization, and daily commuting. Caregivers from Large Rural, Small Rural, and Isolated Rural communities completed semi-structured interviews focused on their well-being (e.g., stress, quality of life, and social support) and child's healthcare to appreciate the unique needs and differences between rural communities. Interviews were preliminarily coded via a qualitative content analysis in NVivo 14. Child healthcare themes for intervention and PCPs included the following: caregiver's feelings about their providers, how they contacted their providers, their interactions with their providers, and the support obtained from providers.

Results: Eleven primary caregivers (4 Large Rural, 4 Small Rural, and 3 Isolated Rural; $Mage = 33$; $SD = 6.2$; 100% female) completed interviews. Mothers were 64% White, most attended some college (36%), and reported a median household income of \$50,000 to \$75,000. Autistic children were 64% male ($Mage = 7.3$; $SD = 4.8$). In comparison to mothers from Large Rural communities, mothers from Small Rural and Isolated Rural communities uniquely noted the following concerns: their child's therapy providers were not meeting their child's needs, caregiver-provider interactions could be contentious, a lack of knowledgeable providers, felt stigmatized in their communities, isolated themselves and their families, and had uncontrolled levels of stress.

Conclusions: Findings suggest that RUCA categorizations of rurality help to reveal that families with an autistic child from increasingly rural communities experience unique challenges with their service providers and their subsequent well-being. Although efforts to increase provider capacity (Tomeny et al., 2023; P. Nowell et al., 2020) and implementation of parent interventions to promote caregiver well-being (Lee et al., 2024; Tsujita et al., 2023) could benefit all communities, these services may be particularly crucial in smaller rural communities.

401.097 Experiences of Affiliate Stigma and Depressive Symptoms in Caregivers of Autistic Children: The Moderating Effect of Social Support

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Background: Caregivers of autistic children are often subjected to stigma which can have negative consequences on their mental health. Affiliate stigma refers to the internalization of stigma among individuals closely associated with a person from a stigmatized group. Previous research has found a mediating effect of social support on the relationship between affiliate stigma and depression among caregivers of children with neurodevelopmental conditions. Extending this work to explore the *moderating* effect of social support can help determine if there is an interaction between affiliate stigma and social support that influences the strength and direction of this effect on depressive symptoms. As such, we conducted an online study to examine social support as a moderator of affiliate stigma on depressive symptoms among caregivers of autistic children.

Objectives: (1) To examine the relationship between affiliate stigma and depressive symptoms. (2) To examine the relationship between social support and depressive symptoms. (3) To examine the moderating effect of social support on the association between affiliate stigma and depressive symptoms.

Methods: Participants included 110 caregivers (95 mothers) of autistic children under 18 ($M = 11.28$, $SD = 3.80$). In addition to demographic information, caregivers completed online questionnaires including the Family Stigma Questionnaire, the Multidimensional Scale of Perceived Social Support, and the Center for Epidemiological Studies Depression Scale. A hierarchical regression was run to determine if social support moderated the association between affiliate stigma and depressive symptoms. Child age and household income were included as control variables. **Results:** Higher levels of affiliate stigma were associated with greater depressive symptoms ($\beta = .34$, $t(109) = 3.77$, $p < .001$). Higher levels of social support were associated with fewer depressive symptoms ($\beta = -.25$, $t(109) = -2.79$, $p = 0.006$). When social support was added as a moderator, the interaction accounted for only an additional 0.80% of the variance in depressive symptoms and the moderating effect of social support was not significant ($R^2 = 0.23$, $F(103) = 1.10$, $p = 0.297$).

Conclusions: Caregivers of autistic children with high levels of affiliate stigma reported high levels of depressive symptoms. Additionally, those who reported greater social support reported fewer depressive symptoms. However, social support did not moderate the relationship between affiliate stigma and depressive symptoms. Findings suggest that social support may not be an ideal intervention target for reducing depression that is associated with affiliate stigma in caregivers of autistic children. Future research should explore the moderating effects of other variables, such as mindfulness. While social support did not directly impact the association between affiliate stigma and depression, it did appear to influence depressive symptoms more generally. These findings support the need for increased social support access for caregivers of autistic children as it may mitigate negative impacts on caregiver well-being.

401.098 Experiences of Autistic Students in a Canadian Neuro-Affirming Blended-Learning Centre

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Background: Traditional brick-and-mortar schools can act as a systemic barrier to autistic students, as many students experience overwhelm due to social expectations and sensory-overload (Rizzo et al, 2012). Research is emerging that the real-world effects of inclusive education may not be as positive as idealized (Chan et al., 2018; Lindsay, 2007). Due to its broad-reaching effects, autism research is conducted by a diverse range of professionals (including architects, speech-and-language pathologists, occupational therapists, psychologists, educators, and self-advocates): each offers guidance and best practices to support autistic individuals. There are literature gaps in both 1) the synthesis of multi-disciplinary best-practice approaches, and 2) between research and the practical implementation of said best-practices (Hallinan, 1996), or rather, a lack of organized and implemented common-sense (Punch, 2014). A set of guidelines is needed for educators and policy makers such that autistic students' mental well-being are positively affected by feeling understood, supported, and safe in their learning environments, so that they may embrace their autistic identities and positively connect with peers, while building a foundation of skills needed to live a joyful and engaged life.

Objectives: The purpose of this study is to benefit the autistic community by gathering empirical data from the lived experience of autistic students who attended a neuro-affirming blended-learning centre: I created the program under study based on synthesized knowledge and best-practices from current autism research, learning science, psychology, and brain science. These data will inform social-policy makers and service providers, having the goal of affecting neuro-affirming change that will increase the mental well-being of autistic students (Mertens, 2009): I will investigate how autistic students perceived their experiences while they attended said neuro-affirming blended-learning centre, and how those experiences affected their mental well-being.

Methods: I will undertake an interpretive-hermeneutical phenomenological study (Creswell & Creswell, 2018), with 10 individual semi-structured qualitative interviews (Creswell & Poth, 2018). Participants will be recruited through purposive sampling (Cresswell & Poth, 2018). Participants will be asked a pre-set list of questions, with researcher flexibility to modify questions and follow an iterative path as the research unfolds. Due to the challenges of researching my own organization, I will have a researcher conduct the interviews. Each interview will be video recorded and transcribed, with the aim to tease out the participant's rich lived experiences and perceptions of those experiences. The transcripts will be organized, stored and sorted using NVivo software, as well as printed for manual paper-based reading and coding.

Results: IN PROGRESS. To increase credibility, reduce unconscious bias, and reduce my position of power, I will involve a second researcher in coding, analyzing, and interpreting the data. Personal observations and research suggests that data should show an improvement in participants' mental health.

Conclusions: IN PROGRESS. I will conclude the presentation of my findings with a highlight of significant quotes from the transcribed interviews, which will be analyzed through a disability-theory lens (Mertens, 2009), formulated into themes, and used to describe and portray the essence of the participant's experiences.

401.099 Experiences of Pregnancy and Early Parenthood Among Autistic People in Australia

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Background: Autistic adults face significant barriers accessing quality healthcare and frequently report negative experiences with practitioners. These challenges are evident across all areas of healthcare, including maternity care. Despite the importance of accessible prenatal and antenatal care, research on the experiences of Autistic people during pregnancy remains scarce, leaving healthcare practitioners without an evidence base to guide care.

Objectives: The purpose of this qualitative study was to explore the pregnancy and early parenthood experiences of Australian Autistic individuals. By addressing this critical gap, the study seeks to provide insights that can guide healthcare providers in offering more tailored and effective healthcare for Autistic people.

Methods: Nineteen Autistic individuals (60% White, $M_{age} = 34.11$, $SD_{age} = 4.4$) participated in this study. Seventeen were professionally diagnosed, while two self-identified as Autistic. All participants resided in Australia and were currently pregnant or had been pregnant within the past five years. They represented both rural and urban settings and identified as either female ($n = 15$) or non-binary ($n = 4$). Participants came from diverse backgrounds and shared a range of pregnancy experiences, including loss and premature birth. To enhance accessibility, participants were able to choose their preferred mode of interview (written, Zoom, or phone). The data were analyzed using reflexive thematic analysis.

Results: We generated four themes with associated subthemes from the stories that were shared. The first theme generated, "Pregnancy was good for me," reflected feelings of body positivity and empowerment during pregnancy. Theme 2, "Hyperfocus as an understatement," illustrates participants' desire to seek information on every aspect of their pregnancy and parenthood journey. We describe how this intense research and the pursuit of answers resulted in both facilitators and barriers to wellbeing. Theme 3, "I'm lost in the system," describes the social drain caused by unpredictable interactions with healthcare workers. Finally, Theme 4, "Making things work for me," addresses the coping mechanisms employed by participants to offset the high demands of pregnancy, including positive support and the intentional strategies they used to cope and persevere through each stage of pregnancy and early parenthood.

Conclusions: This paper and our findings amplify the stories of competence and empowerment among Autistic people during pregnancy and early parenthood, highlighting their resilience and agency in navigating these life transitions. This study enhances understanding of the pre- and postnatal experiences of Autistic people, filling a critical gap in healthcare knowledge. Importantly, these findings have broader implications for improving healthcare in other areas where Autistic people face similar challenges, emphasizing the need for more inclusive and effective care to enhance quality of life.

As an outcome of this research, our team developed an Australia-first digital platform offering resources for both Autistic women and the practitioners who support them. The platform was co-developed along with a team of Autistic parents who have guided the lifecycle of this project. The platform aims to increase the knowledge and confidence of Australian maternal healthcare professionals, while also offering Autistic people validation and shared experiences of pregnancy and early parenthood.

401.100 Exploration of Chinese Autism Terminology Among Autism Community Stakeholders in Hong Kong

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Background:

Autism terminology has been increasingly concerned by the autistic community. Not only different terms referring to autism represent various meanings and narratives, terms in different languages can also be understood and preferred by local stakeholders differently. While most of the discussions were from Western contexts, autism terminology in Chinese contexts is unknown.

Objectives:

To explore the perceptions of autism terminology in Hong Kong autism community.

Methods:

This presentation reported the results from a larger interview study about the needs of autism community in Hong Kong. One of the sections was focused on the use of autism terminology. Questions included: What considerations do you have about autism terminology? What term(s) do you or others in the community use or prefer? What do you think about the different terms? 49 stakeholders from the Hong Kong autism community (20 autistic adults, 19 parents of autistic individuals, and 10 professionals who had experience working with autistic individuals) completed semi-structured individual interviews using Cantonese Chinese. Interviews were audio-recorded and transcribed verbatim. Thematic analysis was conducted to reveal the patterns of their responses and any commonalities or differences between stakeholder groups.

Results:

All stakeholder groups described the theme of "stigma" and negative images associated with autism circulating in Hong Kong, such as confusing autism with intellectual disability or "being crazy". The Chinese term for autism literally means "self-isolated", which many expressed concerns of misleading information that autistic people only are aloof and reject social relationships. To avoid being ridiculed or maltreated, some autistic adults and parents avoided associating themselves with autism, so instead they used fuzzy ways to talk about autism.

A sense of "indifference" was expressed by autistic adults and parents as they expressed that "[whatever autism terminology] does not matter". Parents were more concerned about their children receiving the right interventions. Some autistic adults appeared to "let it go" due to autistic burnout.

Other two themes were related to sociocultural influences. Some stakeholders described the generational differences in the usage of autism terminology. Some parents indicated their senior family members (e.g., grandparents) do not believe about autism. Professionals also recalled terms (e.g., "bai-yi") that might not be accepted by contemporary Hong Kong society, but was commonly used by older generations because and did not bother them.

Some autistic adults and professionals preferred terms adopted from Western narratives, such as neurodiversity and "Aspie", because these conveyed concepts that are more supportive of identity development and inclusion. However, they recognized that these terms are influenced by Western values and are not familiar by local people.

Conclusions:

Autism terminology and (mis)understanding of autism are interrelated, which are influenced by various sociocultural factors. The notable absence of debate between person-first and identity-first language is sensible as Chinese language does not have grammar markers to distinguish these two terms. The tendency to sustain group harmony also makes autism-identity assertion more culturally costly in Chinese society. To promote authentic understanding and sensible framing of autism, choice of autism terminology needs to be sensitive to local cultures and narratives.

401.101 Gender Differences in the Prevalence of Autistic Experiences of Interpersonal Violence: A Mixed Methods Systematic Review and Meta-Analysis

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Background: Interpersonal violence is a leading cause of mortality among youths and incurs significant costs to public health and safety, globally. Increasing empirical evidence suggests rates of interpersonal violence are particularly high among autistic people, particularly among females and gender minorities (e.g., non-binary/gender-fluid, transgender); however, findings are mixed and vary by form of violence.

Objectives: We undertook a mixed methods systematic review and meta-analysis to explore violence prevalence among autistic people of various gender identities. We utilised a random effects meta-analysis to examine gender differences in interpersonal violence prevalence among comparative groups of males, females, and gender minorities.

Methods: A systematic database search of EMBASE, CINAHL, SocINDEX, MEDLINE Complete, PsychINFO, and Web of Science identified 64 studies examining combined and varying forms of physical, sexual, and psychological interpersonal violence among autistic people diverse in gender, age, and level of support needs. We undertook a random effects meta-analysis with pooled data from 24 eligible studies comprising 12,375 autistic participants aged between 2 to 83 years examining gender differences in violence prevalence among comparative groups of males (73.7%), females (17.7%), and gender minorities (1.6%). Data not included in the meta-analysis were assessed via narrative review of 62 studies comprising 19,539 autistic participants (73.7% males, 23.1% females, 1.6% gender minorities, 1.7% other/non-specified [n/s]), and 301,864 non-autistic participants (34.1% males, 62.9% females, 0.01% gender minorities, 2.66% other/n/s).

Results: Analyses found increased overall violence prevalence among autistic females compared to males ($d = 0.32$, $p < .001$), during adulthood, and childhood and adolescence combined, but not during childhood or adolescence when examined separately, regardless of intellectual disability co-occurrence. The largest effect size was for sexual violence ($d = 0.67$, $p < .001$). Autistic gender minorities (e.g., transgender, gender-fluid) were more likely to experience overall violence than autistic males ($d = 0.73$, $p < .05$), yet not autistic females. Narrative synthesis of 62 studies indicated autistic people were more likely to experience lifetime violence compared to non-autistic controls. Gender-marginalized groups (e.g., females, transgender, non-binary) had higher rates of violence than cis-males; however, this difference varied by age and violence type.

Conclusions: Findings suggest that autistic populations face disproportionate experiences of overall and various types of interpersonal violence relative to general populations, implicating a concerning high prevalence of violence and repeated violence across the lifetime, particularly among females and gender minorities.

**401.102 Exploring Character Strengths Using Values in Action-Youth Survey in Autistic Young People – a Cognitive Interview and Reflective Practice Qualitative Study**

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Background:

The shift towards celebrating neurodivergence including strengths and differences have led to more Strength-Based Approaches (SBA) in autism research. Most SBA focus on skills, talents and focused interests that improve functional outcomes (e.g., academic attainment). Few explore how personal characteristics can support identity development and wellbeing in autistic young people (YP). Using the Values in Action (VIA)-Youth survey, we explored how Character Strengths (CS) can enable autistic YP to be at their best and live authentically in daily life, to foster identity development and wellbeing.

Objectives:

- Explore the acceptability and feasibility of using VIA-Youth survey to identify CS in autistic YP (12-15 years-old) using cognitive interviewing technique.
- Explore autistic YP's reflections on building awareness of, exploring, and applying CS in daily life.

Methods:

13 autistic YP (M (SD) years: 13.54 (1.27); Table 1) recruited online participated in two one-to-one interviews. Interview one: YP each completed the VIA-Youth (98 items to evaluate 24-CS) survey with an interviewer (~90 minutes). The interviewer elicited examples and clarified confusing items by explaining the CS being examined. YP reviewed personal CS profile for 1-2 weeks before returning for interview two. Interview two: YP reflected on face validity of the CS report, what they learnt about themselves during the process, and strengths they wished to share with others and why (~60 minutes). All interview data were analysed using reflexive thematic analysis (Braun & Clark 2013).

Results:

[Aim 1] Autistic YP found the VIA-Youth survey acceptable and feasible to use. However, poor context specificity made it harder to identify an accurate rating. For example, YP reported high levels of Curiosity and Love of Learning if the statements specifically related to areas of focused interests, but less so for general daily activities. YP found the abstract language used for Spirituality questions harder to interpret beyond religious contexts.

[Aim 2] YP found the CS profile to have good face validity (Figure 1). YP endorsed certain strengths (e.g., Humour and Creativity) as part of neurodivergent thinking, and related Social Intelligence to masking (i.e., "acting normal" without understanding social context). Many highly endorsed Honesty and Fairness, leading to higher Bravery (standing up for others being treated unfairly), and lower Forgiveness (when trust has been broken in relation to negative social experiences). Co-occurring mental health conditions influenced Prudence (rumination over decision-making for fear of making a mistake), and Hope (lack future-oriented thinking when stuck in a difficult situation). YP found the CS profile helped consolidate and improve self-awareness and identified strengths to rely on to navigate stressful situations. Some YP wished to share the profile with their school to improve strengths-based learning and reduce misunderstanding.

Conclusions:

This is the first study to show that a structured CS profile can scaffold conversations to help YP notice personal qualities as strengths that guide their actions beyond skills and talents. Improving self-awareness of CS to navigate difficult situations may enhance resilience. Collaborative use of VIA-Youth survey for CS identification can support autistic YP to build self-awareness, positive identity, and better wellbeing.



401.103 Exploring Character Strengths in Autistic Young People Based on Parental Responses on the Values in Action-Youth Survey – a Cognitive Interview and Reflective Practice Qualitative Study

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Background:

The increase in neuroaffirmative practises and strength-based approaches in autism research have often focused on skill-based strengths that improve life outcomes, with few exploring how personal characteristics and values most important to autistic young people (YP) can support their identity development and wellbeing. Using the Values in Action (VIA)-Youth survey with parents/carers (here on: parents), we explored how parents can identify and apply Character Strengths (CS) to support their autistic YP.

Objectives:

- Explore the acceptability and feasibility of parents using the VIA-Youth survey to identify autistic YP's (8-15 years) CS using cognitive interviewing.
- Explore parents' reflections on building awareness of, exploring, and supporting their autistic YP to use their CS in daily life.

Methods:

15 parents (M (SD) years: 43.6 (1.46); Table 1) of autistic YP (aged 8-15) recruited online, participated in two one-to-one interviews. Interview one: interviewer and parents completed the VIA-Youth (98 items to evaluate 24-CS) survey together. Interviewer focused on eliciting examples from YP's life and clarified confusing items by explaining the CS being identified (~90 minutes). After reviewing the CS profile (1-2 weeks), parents returned for interview two. Interview two: parents reflected on the face validity of the CS report, what they learnt about their YP, and which CS they wished to share with others in their YP's life and why (~60 minutes). Interview data was analysed using reflexive thematic analysis (Braun & Clark 2013).

Results:

[Aim 1] Parents found using the VIA-Youth survey acceptable and feasible. However, many parents reported higher levels of Zest and Love of Learning only about areas of focused interest, but less so for typical day-to-day activities. Parents found some concepts (e.g., Spirituality and Forgiveness) too abstract to apply to their YP due to their maturity and cognitive functioning. Parents noted some CS (e.g., Humour and Curiosity) are expressed differently in autistic YP and their definitions can be improved through a neuroaffirmative lens.

[Aim 2] Parents found the CS profile to have good face validity in general (Figure 1). Parents identified some CS (e.g., Curiosity, Honesty, and Bravery) that enable their YP to live authentically, can also increase social misunderstanding. Parents noted Social Intelligence may relate to masking in unfamiliar or challenging environments. Difficult peer relationships give rise to few opportunities for Leadership and Teamwork beyond the family environment. Opportunities for YP to express and parents to identify YP's CS are limited by the impact of having many co-occurring mental and physical health conditions. Parents found focusing on strengths in autistic YP a refreshing experience that allowed them to navigate challenging situations by drawing on their YP's strengths. Going forwards, parents hoped to celebrate and share their YP's CS with others, enabling understanding and foster supportive environments to promote CS development.

Conclusions:

This is the first study to demonstrate that guided conversations around CS enable parents to identify qualities and values within their autistic YP, beyond skill-based talents. Supporting parents to build awareness of, explore, and apply CS within their YP may strengthen their YP's resilience and wellbeing.



401.104 Exploring Familial Support Needs and Impact of Amount of Service Use on Parental Mental Health in Families with Autism and Related Conditions: A Mixed-Method Approach

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Background: Evidence-based interventions and auxiliary (e.g., speech, occupational therapy) services are important in meeting the unique needs of developmentally/intellectually disabled (D/ID) children (Khawar, 2024). Notably, families of children with D/ID may experience structural, cultural, and familial barriers while accessing services, which can lead to a negative impact on parental mental health (Frazee et al., 2012; Moodi et al., 2014; Pickard & Ingersoll, 2015). Relatedly, parents of D/ID youth report greater symptoms of stress and depression (Dukmak & Alkhatib, 2021) than parents of neurotypical children

Objectives: This study uniquely compared parental mental health based on their child's service utilization, presence of diagnosis of or support around their mental health conditions via mixed methods approach to understand family support needs.

Methods: Forty parents (87.5% female; 60% non-white; 80% ages 35-54) of children with D/ID (72.5% ASD; 10% Down Syndrome; $Mage=11.60$, $SDage=5.62$; 77.7% male) completed a measure of parental depression (BDI-II; Beck, 1996), parenting stress (PSI-4-SF; Abidin, 1995), parental psychological flexibility (AAQ-II; Bond et al., 2011), and parental emotion regulation (DERS; Gratz & Roemer, 2004), and provided information on child's and their service utilization. The parents were also asked two open-ended questions: a) what is your greatest struggle with your D/ID child? and b) what type of supports would be helpful for you?

ANOVAs (child receiving ABA vs. auxiliary services vs. no services vs. both; parent receiving counseling or not; and parent with diagnosed mental health condition) and content analysis of survey responses (Levitt et al., 2017) were conducted to assess study aims.

Results: There were significant differences in parental psychological flexibility and parental depression (all $ps<0.05$) between parents with and without a diagnosed mental health condition as well as those seeking counseling or not, the latter also manifesting differences in parenting stress. No significant differences (all $ps>0.05$) in parental depression, parental psychological flexibility and parental emotion regulation were noted based on child's receiving varying services. Further, qualitative analyses revealed that parents struggled to find suitable, accessible and effective services for their child, while balancing multiple vocational and personal responsibilities (e.g., other children in the household). Moreover, corroborating with the quantitative results, qualitative analyses indicated parents reporting 1) the need for mental health interventions for themselves and their child (e.g., mindfulness, stress management), 2) the need for parental education to improve parent-child interaction (e.g., behavior management training) to increase parental sense of competency and 3) support for transition-age youth.

Conclusions: Overall, our findings suggest the importance of specific supports for parents and caregivers of D/ID children. Ultimately, navigating services is a stressful experience, and case management/social worker support may be beneficial in order to alleviate the negative impact on parental mental health. Further, timely diagnosis of parental psychopathology and ongoing therapeutic supports may be integral to foster parental mental health. Crucially, access to educational information that cater to diverse demographic groups need to be implemented in policy-making initiatives to enhance parental empowerment and advocacy. Additionally, there is a dire need for transition-age therapeutic and vocational programs (e.g., social skills, life skills) for families.



401.105 Exploring the Barriers and Facilitators Faced By Caregivers and Healthcare Workers Supporting Children with Autism in Sri Lanka: Perspectives from a Lower- Middle-Income Country

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Background:

Autism is a neurodevelopmental condition with a multifactorial etiology, making it essential for stakeholders in the autism care pathway to stay informed about its evolving nature and available support. Caregivers and healthcare workers serve as pivotal first points of contact, significantly impacting the support provided to children with autism. While Sri Lanka is recognized for its established healthcare infrastructure, this alone is inadequate; raising awareness about availability and accessibility of healthcare services is crucial to ensure effective use of healthcare resources for children with autism. To enhance the effectiveness of comprehensive care and support services to children with autism, it is important to understand the dynamic barriers and facilitators within the existing healthcare system as well as the caregivers' needs.

Objectives:

To gain an in-depth understanding of 1) the barriers and facilitators experienced by caregivers of children with autism and healthcare workers providing services for children with autism in the Western Province, Sri Lanka, 2) what these findings might mean for future research and service delivery.

Methods:

This qualitative study was conducted in the Western Province of Sri Lanka comprising 8 caregivers of children with autism and 8 healthcare workers, from Public Health Midwives, Medical Officer of Health to officials from the Ministry of Health, providing services for children with autism. Semi-structured onsite individual key-informant interviews were conducted to gather data. Thematic analysis was carried out following the Braun and Clarke, 2006 method.

Results:

Caregivers face challenges such as limited parent-child interaction time, stigma, inadequate awareness about autism and lack of support systems. Despite a well-established healthcare system, the majority of caregivers are unaware of available services; healthcare workers report a decline in caregivers of children with autism seeking healthcare services. Healthcare workers encounter similar issues: societal misconceptions leading to denial of diagnosis among parents, disparities in service availability and uneven distribution of services, with most services centered in urban areas, shortages in trained professionals due to brain drain, and lack of specified tailor-made training sessions on autism.

Facilitators for caregivers include awareness of typical child development, access to information through technology, proactive parenting, and support from family and social networks. For healthcare workers, established information-sharing systems, trust in frontline healthcare workers, and general capacity-building initiatives enhance their effectiveness.

Conclusions:

The findings indicate a notable gap between the experiences of healthcare workers and parents about accessing healthcare. Additionally, variations in knowledge and training requirements among healthcare workers highlight the need to address these gaps to enhance the quality of care provided. Many healthcare workers lack specialized knowledge about autism following talent migration, and this creates the need for more tailored training and capacity-building sessions for healthcare workers on autism. This would help address the gap in expertise and improve specialized care for children with autism.

401.106 Exploring the Camouflaging Experiences of Canadian Autistic Women and Nonbinary People through the Lens of Impression Management

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Background: Autistic and non-autistic individuals use Impression Management (IM) to positively shape others' perceptions.¹ For Autistic individuals, IM also involves suppressing Autistic traits, mimicking non-autistic behaviours, and self-monitoring (called camouflaging/masking).^{2,3,4} Despite much research, there is no clear consensus on defining, measuring, or understanding the processes of Autistic camouflaging.⁵ Ai and colleagues¹ aimed to bridge IM literature with research on Autistic camouflaging, proposing four components for understanding its mechanisms: individual skills, motivators, behaviours, and consequences. This qualitative analysis of interview data,⁶ collected to understand the camouflaging experiences of Autistic women and non-binary Canadians, evaluated the extent to which the IM Framework captured the experiences of camouflaging amongst our participants.

Objectives: This study explored 3 questions: (1) Is the IM framework effective at capturing all aspects of our participants' experiences of camouflaging? (2) To what extent do our participants describe similar individual skills, motivators, behaviours and consequences of IM? (3) Did the framework not capture any aspects of the participants' descriptions? If so, how might the framework need to be adapted?

Methods: Data was initially gathered through semi-structured interviews with 10 Canadian Autistic women and nonbinary individuals (aged 18 to 35) related to camouflaging. Interviews were transcribed and segmented into thought units (t-units; i.e., meaningful chunks of text).⁷ The analysis was pre-registered on OSF.⁸ Using Framework Analysis, a codebook was developed based on the IM framework.^{9,10} Two research assistants independently coded each transcript, adding new codes to capture participants' experiences. Newly identified codes from uncategorized t-units were analyzed, leading to proposed modifications to the IM framework. Analytic memoing and bracketing were used to mitigate biases and ensure rigour and transparency.^{11,12} The trustworthiness of findings was supported through memoing and peer debriefing.^{13,14}

Results: Participants' experiences validated three aspects of IM: self-concealment, self-presentation, and self-monitoring of their situation. The motivators and consequences of *not* engaging in IM were missing in the original framework. Three key motivations emerged for not using IM included pride in Autistic identity, the presence of safe and accepting environments (often among other neurodivergent individuals), and a desire to increase visibility and challenge stereotypes about autism. Participants often used IM to fit in and avoid stigma, aiming to counter unjust judgments and marginalization from non-Autistic individuals. Notably, both using and reducing IM had similar negative consequences, such as feelings of disconnection or shame. Autistic individuals often faced a double bind: they felt ashamed for being "too Autistic" while also for not being "Autistic enough."

Conclusions: The experiences shared by our participants underscore the need for societal transformation that embraces autism as a distinct neurotype rather than a collection of deficits. One participant reflected on how using IM influenced her life, "I definitely would not be living the life I'm living today ... because of the way people see autism almost as a burden. [So no], I would not be where I am today. [But] I think if everybody were accepting, it would be completely different."



401.107 Factors Predicting Stress in Ethnoracial Minority Families of Autistic Children

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Background: Parents of autistic children endorse high stress levels, seemingly driven by several factors, including their child's higher level of autistic traits, increased stigma, and lack of access to supports (Bonis, 2016). However, much of the extant research has focused on the experiences of White families, so less is known about factors driving familial stress in ethnoracial minority families, though these families may need additional supports due to intersecting, marginalized identities (Hatzenbuehler et al., 2013). Furthermore, autistic children from ethnoracial minority groups are less likely to access autism-specific services, leaving these families with varied, unaddressed needs (Benevides et al., 2016; Smith et al., 2020; Vohra et al., 2014).

Objectives: We aim to consider the effects of autism stigma, autism knowledge, unmet needs, and access to services on the relationship between a child's autistic traits and familial stress. This endeavor may provide insight into how to better support ethnoracial minority families of autistic children in order to reduce stress.

Methods: Fifty-two parents (90.4% mothers) of autistic youth ($M_{age}=10.98$, $SD_{age}=4.61$; 78.8% male; 71.2% South Asian, 13.5% Middle Eastern/North African, 7.7% East African, 7.7% multiracial) completed measures about their child's autistic traits (Constantino & Gruber, 2012), their experiences navigating systems of care (Jafarabadi et al., 2021), their autism stigma and knowledge (Harrison et al., 2017), and familial stress (Gottlieb et al., 2014).

Results: Correlational analyses demonstrated that autistic traits negatively related to access to services ($r=-.31$; $p=.03$) but positively related to unmet needs ($r=.30$; $p=.04$) and total stress ($r=.48$; $p<.001$). Familial stress was also negatively correlated with autism knowledge ($r=-.37$; $p=.01$) and autism stigma ($r=-.39$; $p=.007$) such that higher stress was associated with less autism knowledge and greater stigma.; However, familial stress was positively correlated with unmet needs ($r=.37$; $p=.01$). Path analysis revealed a significant direct effect of autistic traits ($\beta=.37$, $p<.001$) on familial stress, while adjusting for other variables in the model. There were also direct effects of level of autistic traits on unmet needs ($\beta=-.30$, $p=.03$) and access to services ($\beta=-.30$, $p=.03$). However, no direct effects were observed between level of autistic traits and autism stigma or knowledge, and the indirect effects in the model were not significant (all $ps>.05$). Overall, approximately 35% of the variance in familial stress is collectively explained by autism knowledge, autism stigma, total unmet needs, access to services, and autistic traits.

Conclusions: In an understudied, racially-diverse sample, a child's level of autistic traits seems to directly impact familial stress, unmet needs, and access to services. Overall, autistic traits predict familial stress above and beyond other factors for these groups. These results suggest that families of children with more autistic traits may struggle to access services to the necessary extent and therefore have unaddressed needs. It is imperative that families most in need of support and services be able to access them to reduce stress and improve overall well-being. Future research should seek to understand additional mechanisms that may impact the relationship between level of autistic traits and familial stress in ethnoracial minority families.



401.108 Family Environment and Child Adaptive Skills, Not Autism Symptoms, Predict Parenting Stress in FMR1 Conditions

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Background: The *FMRI* premutation (FXp) is caused by an expansion of 55-200 CGG repeats on the *FMRI* gene, affecting 1:148-291 females^{1,2}. The primary risk initially associated with FXp women was expansion into the full mutation (FXS; >200 CGG repeats) for offspring. Research now shows FXp women may have a child with FXp and are at-risk for mental health and parenting difficulties³⁻⁵, with 20-85% of these mothers reporting high-to-clinical parenting stress⁶⁻¹² and greater stress in FXp mothers than mothers of neurotypical (NT) children¹³. The FXp child phenotype is associated with elevated autism symptoms and mild developmental impairment in some, while the FXS phenotype is more severe, with elevated autistic features and intellectual impairment in most¹⁴. Parenting stress theory posits parenting stress is a function of child, parent, and environmental factors^{15,16}, with autism implicated with higher stress^{17,18} but child adaptive level and positive family environments associated with lower stress¹⁹. Identifying factors that impact parenting stress during infancy to buffer chronic elevated stress' impacts²⁰ in vulnerable groups, like FXp mothers with genetic liability, makes this research critical for intervention targets.

Objectives: Determining predictors of parenting stress in FXp mothers with infants.

Methods: Participants included 128 mothers and their 12-month FXp, FXS, or NT infants ($n_{FXS} = 36$ (64% male), $n_{FXp} = 30$ (53% male), $n_{NT} = 62$ (71% male); $\bar{x} = 12.38$, $s = 0.77$). Measures included the *Parenting Stress Index*²¹ and *Family Environment Scale*²² for mothers; for infants, measures included the *Vineland Adaptive Behavior Scales*²³⁻²⁵ and *Autism Observation Scale for Infants*²⁶. An ANOVA tested group differences. Hierarchical linear regression models tested which family or child factors predicted parenting stress, correcting for multiple comparisons.

Results: Mothers of FXS infants reported significantly more stress than mothers of NT ($p < 0.001$) and FXp ($p = 0.012$; Figure 1) infants. For NT and FXp, no factors predicted parenting stress. For FXS, family expressiveness ($\beta = -6.04$, $p = 0.005$) and child adaptive ability ($\beta = -0.19$, $p = 0.008$) significantly predicted parenting stress (Figure 2), with family expressiveness and child adaptive ability ($F(2, 29) = 6.24$, $p = 0.006$) explaining more variability ($R_{family+child}^2 = 0.25$) in parenting stress than each factor alone ($R_{family}^2 = 0.21$, $R_{child}^2 = 0.17$).

Conclusions: Despite FXp mothers' genetic vulnerability for mental health difficulties, mothers of FXS infants uniquely reported more stress than mothers of FXp and NT infants, independent of autism symptom severity. Factors contributing to parenting stress differed per infant genetic group. For mothers of FXS infants, higher family openness and child independence was associated with lower mother stress, supporting findings that positive family environments and child adaptive skills in FXS buffer maternal stress^{9,10,27-29}, distress³⁰, and internalizing symptoms³¹. The combined effect of child adaptive ability and family expressiveness accounting for the most variance in maternal stress suggests interventions targeting *both* characteristics could harness a strengths-based approach, bolstering family openness and child independence to minimize parenting stress in vulnerable mothers. This work is critical as it advances understanding of gene-environment interactions in *FMRI* conditions highly associated with autism.



401.109 Family Resilience in Parenting Young Children with ASD

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Background:

Resilience within families may temper the risk of high parenting stress faced by parents of young children with ASD. Within families, individual differences between parents may contribute differently to resilience.

Objectives:

To explore the contribution of intrapersonal and contextual factors associated with resilience within families of young children with ASD.

Methods:

A cross-sectional study ($n=249$ individuals) wherein resilience within families is addressed by investigating (1) family parenting stress, (2) associated factors contributing to maternal ($n=87$) and paternal ($n=74$) resilience, and (3) factors relating to resilience within families ($n=74$) of 3-to-6-year-old children with ASD ($n=88$).

Results:

(1) The percentage of families with regular parenting stress in both parents (33%) is almost equal to the proportion of families with (sub)clinical parenting stress in both parents (36%), families with mothers experiencing (sub)clinical and fathers experience regular parenting stress are twice as common (22%) than the other way around (9%). Contributors to (2) mothers' resilience to parenting stress are good planning/organizing skills and satisfaction with their social relations. Contributors to fathers' resilience are low levels of 'worrying' and good social relations. The shared contributing factor to resilience within families (3) is the satisfaction of both parents with their social relations.

Conclusions:

Most of the parents of the same young child with ASD experience a comparable degree of parental stress, with different dynamics in individual parents contributing to resilience within families to parenting stress. This suggests the need for a personalized parental approach within families with young children with ASD.

401.110 Characterizing Correlates of Caregiver-Reported Quality of Life Amongst Individuals with Neurogenetic Conditions

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Background: Prior research has found that quality of life (QoL) is lower amongst autistic individuals and their families when compared to other disability groups. Individuals with neurogenetic conditions have a high probability of having a co-occurring autism diagnosis. Although several studies have explored the associations between autism diagnosis/traits and QoL amongst individuals with neurogenetic conditions, the role of other factors, including mental health conditions and sleep difficulties, remains unexplored, despite these issues being common amongst individuals with autism and other neurogenetic conditions.

Objectives: To characterize correlates of different aspects of caregiver-reported QoL amongst individuals with neurogenetic conditions.

Methods: Caregivers of individuals with neurogenetic conditions (e.g., PTEN Hamartoma syndrome, SYNGAP1, Malan Syndrome, etc.; N=255, 125 Female, 130 Male; Mage=14.2 [range: 3-45]) completed a battery of online surveys. Two five-step hierarchical linear regression models were used to understand the unique contributions of each subset of variables (demographics, autistic traits, internalizing symptoms, externalizing symptoms, and sleep) on two subcategories of caregiver-reported QoL: family and physical/mental health.

Results: With regards to family QoL (FQoL), in the first step, demographic variables significantly predicted FQoL ($F = 22.18, p = .001$), with 30.1% of the variance explained. In the second and third step, autism traits and internalizing symptoms provided an additional 18% ($F = 31.49, p < .001$) and 6% ($F = 26.32, p < .001$) of variance, respectively; in the fourth and fifth steps externalizing symptoms and sleep did provide significant increase in the variance explained. In the final model, significant correlates of FQoL (a total of 55.1% of variance explained) included speech level, challenging behavior, and executive functioning (see Table 1). With regards to physical/mental health QoL (HQoL), the first step including demographic factors accounted for 7.1% of the variance ($F = 3.95, p = .004$). Each step in the hierarchical regression model resulted in a significant change in the amount of variance explained, with the final model explaining 48.2% ($F = 12.08, p < .001$). Significant correlates in the final model included participant sex, RRB, executive functioning, mood, restless sleep, and difficulty waking (see Table 2).

Conclusions: This study highlights the need to examine correlates of QoL beyond autistic traits in individuals with neurogenetic conditions. More specifically, speech level and challenging behavior predicting FQoL suggests that interventions need to do a better job of supporting individuals who have less reliable speech (e.g., by encouraging alternative modes of communication) and who exhibit challenging behaviors. HQoL findings also point to the need for supports that target sleep and mood dysregulation. Support programs that enhance executive functioning are also needed, as this was a significant correlate of both QoL subtypes. It is thus crucial that support services address these factors as opposed to solely focusing on “core” autism traits. Longitudinal research is needed in this area in order to understand causal influences of these factors. Additionally, future research should include other potentially contributing factors, such as perceived stigma and satisfaction with services received. Similar investigations of correlates of self-reported QoL in this population is also needed.



401.111 Autism Community Perspectives on Identity-First and Person-First Language: A Systematic Review of the Literature

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Background: Terms to describe individuals with a (formal or self) diagnosis of autism can be broadly characterized into two categories: person-first language (PFL) and identity-first language (IFL). PFL refers to terms where the “person” is emphasized before the disability (e.g., “person with autism”). IFL refers to terms where the identity label comes before the “person” noun (e.g., “autistic person”). Because of implied meanings (i.e., separating people from their disability; celebrating disability identity), there are sometimes heated debates around these terms, though both are rooted in disability justice. Until recently, PFL was the predominant terminology used in academic discourse about autism, though there is now a shift toward recommending IFL. While recent studies have addressed community preferences regarding language, a review is needed to better inform recommendations and research moving forward.

Objectives: To synthesize findings from quantitative studies regarding autism language preferences amongst autistic individuals and parents/caregivers.

Methods: PubMed and PsycInfo were searched in July 2024 for studies related to autism language preferences. Included studies needed to quantitatively assess preferences from autistic people and/or their families and be written in English. Qualitative studies were excluded. Independent coders extracted the following information from studies: study country and methodology (e.g., type of questionnaire, terms included), sample size, participant demographics, recruitment methods, and participants’ most preferred term. Terms were categorized into “IFL,” “PFL,” or “on the spectrum (OTS)” (while OTS technically is PFL, we coded it separately because it is sometimes seen as a “neutral” alternative). A third coder reviewed the coding and highlighted areas of disagreement; they then met with one of the initial coders to resolve discrepancies by consensus.

Results: Of 1,650 abstracts screened, 30 underwent full-text review; 14 met inclusion criteria. All studies were conducted online. Most were conducted in English; three were in Dutch and two were in French. Sample size ranged from 32-1,026; countries represented included US, UK, Netherlands, France, Canada, Australia, and Belgium. Females were the majority gender in 11/14 studies. Only one reported on participants’ cognitive abilities. There was little consistency across studies regarding which terms were included in surveys. Autistic participants preferred a variety of terms, though 9/12 studies found a preference for IFL. Two of the three studies that found a PFL preference were conducted in Dutch (one was in English); none included an OTS answer choice. A “no preference” option was included in 4 studies; 14.6—35.63% of participants endorsed this. Family preferences were assessed in 4 studies; a PFL preference was endorsed in 3 studies, though there was variation.

Conclusions: While there was a slight preference for IFL amongst autistic individuals, results indicate there is no clear consensus regarding language preferences, with many indicating no preference. Similar variability existed amongst family members. These findings caution against assuming what kind of language an individual/community prefers. Given that study methodologies varied greatly, and online studies are subject to selection and accessibility bias, more standardized research is needed before concrete suggestions can be made.

401.112 Autistic-Led Assessments of Australian Airports Using an Autism-Friendly Framework

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Background: Airports are uniquely complex environments, often overwhelming for autistic travellers due to a combination of unpredictable sensory stimuli, crowded spaces, and the demands of security procedures. While autism-friendly initiatives have gained momentum in other sectors, the application of these principles in airport settings remains limited. This is particularly concerning given the importance of air travel for maintaining connections in countries like Australia, where long distances necessitate flying. Despite some progress in making airports more accessible, comprehensive research grounded in autistic perspectives is lacking.

Objectives: This study aimed to:

1. Identify key accessibility challenges in Australian airports through autistic-led assessments.
2. Evaluate how existing airport environments align with established principles of autism-friendly design.
3. Generate specific recommendations for enhancing airport accessibility based on autistic perspectives.

Methods: We conducted a reflexive thematic analysis of environmental assessment reports from six Australian airports (Sydney, Gold Coast, Canberra, Townsville, Mount Isa, and Melbourne). These assessments, carried out between 2017 and 2024, were led by autistic consultants using an evidence-informed autism-friendly framework. The framework emphasizes eight key elements: inclusive culture, preparation and predictability, structure and visual organization, sensory adaptations, communication supports, proactive problem solving, staff training, and continuous improvement. Our analysis focused on identifying patterns in the autistic consultants' observations and recommendations across these diverse airport environments.

Results: Our analysis generated three overarching themes. The first theme ("Variety of sensory experiences") highlighted how visual, auditory, and olfactory stimuli within airports can significantly impact autistic travellers' comfort and ability to navigate. Positive features included natural lighting and calming visual elements, while challenges included harsh lighting, reflective surfaces, and strong odours. Theme two ("Help passengers to understand what to expect, and what they're expected to do") emphasized the critical role of clear communication and intuitive wayfinding. Autistic consultants identified a need for more comprehensive pre-travel resources, consistent and accessible signage, and visual supports throughout the airport journey. The final theme ("Consider implementing strategies to assist with crowding") underscored the importance of effective crowd management and queue systems. Recommendations included dedicated assistance lanes, clear queuing structures, and collaboration with airlines to implement best practices for supporting autistic travellers.

Conclusions: Our findings highlight both strengths and ongoing gaps in the accessibility of Australian airports for autistic travellers. By centring autistic perspectives, this study provides crucial insights into making complex, high-stress environments more inclusive. The recommendations that emerged provide a roadmap for airports to enhance accessibility, potentially enabling more autistic individuals to engage confidently with air travel. Moreover, this study underscores the value of autistic-led assessments in identifying nuanced environmental factors that may be overlooked in traditional accessibility evaluations. Future research should explore the impact of the proposed changes on diverse autistic travellers' experiences and investigate how these principles can be applied throughout the entire air travel journey.

401.113 Exploring Autism-Friendly Initiatives in Australian Airports: Insights from Autistic Travellers and Families

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Background: Airports can be overwhelming environments for autistic people, characterized by sensory overload, unpredictable procedures, and complex social interactions. These challenges make air travel particularly stressful and often inaccessible for many autistic travellers. Although some airports have implemented autism-friendly initiatives, such as sensory maps, quiet spaces, and the Hidden Disability Sunflower program, however, the effectiveness of these initiatives remains underexplored. Many autistic individuals and their families continue to report barriers that prevent them from having a comfortable and supportive travel experience, highlighting the need for more inclusive and effective approaches to improving accessibility in airports.

Objectives: This study aimed to explore the experiences of autistic adults and parents of autistic children traveling through two Australian airports with autism-friendly initiatives, and identify gaps and opportunities for improving airport accessibility and comfort for autistic travellers.

Methods: We conducted semi-structured interviews with autistic adults ($n = 8$) and parents of autistic children ($n = 5$) who had recently travelled through either Sydney or Gold Coast Airport. Participants were predominantly female ($n = 11$), with ages ranging from 25 to 57 years. Both airports had been implementing autism-friendly initiatives for over five years, including the Hidden Disability Sunflower program, sensory maps, and ongoing autism-specific staff training. Interviews were conducted via email/text, phone, or video, based on participant preference, and ranged from 14 to 30 minutes in duration. Data were analyzed using reflexive thematic analysis, led by an autistic insider-researcher to ensure authentic representation of autistic perspectives.

Results: Three main themes were created. Theme 1 (Airports need to be more accessible) highlighted persistent challenges with sensory overload, emphasizing the need for quiet spaces and comprehensive pre-travel planning. Many participants were unaware of existing accessibility resources until prompted by participating in the study, indicating a need for better communication of available support. Theme 2 ("Those Sunflower lanyards are magic..." when they are recognized) described how the Hidden Disability Sunflower program facilitated more compassionate interactions when recognized by staff, though participants called for greater visibility of the program and more proactive support. Theme 3 ("A greater awareness within the whole industry of hidden disabilities") addressed the inconsistent experiences across different airports and airlines, underscoring the need for industry-wide improvements in understanding and supporting autistic travellers.

Conclusions: Our findings highlight both the progress made and ongoing challenges in creating truly accessible air travel experiences for autistic individuals. The positive impact of initiatives like the Hidden Disability Sunflower program demonstrates the potential for meaningful change. However, persistent issues with sensory overload and inconsistent implementation of supports across the industry underscore the need for continued efforts. To achieve genuinely inclusive air travel, airports and airlines should prioritize autistic perspectives in the design and implementation of accessibility initiatives, provide comprehensive staff training, and work towards standardized, industry-wide approaches to supporting autistic travellers. Future research should explore these issues with larger, more diverse samples and across a wider range of airports to further inform policy and practice in this critical area of accessibility.

401.118 "Not One Size Fits All": Redefining Emotion Regulation Support for Autistic People through Lived Experience

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Background: Traditional approaches to emotion regulation support often fail to address the unique needs and experiences of autistic people, potentially contributing to poor outcomes and reduced well-being.

Objectives: To understand how autistic people experience and manage their emotions, and to identify critical components of effective, neurodiversity-affirming emotion regulation supports

Methods: Qualitative analysis of survey responses from 26 autistic adults and 19 caregivers, examining lived experiences of emotion regulation challenges and perspectives on current supports.

Results: Autistic participants reported diverse strategies for managing emotions, with 77% using music, 65% using weighted objects, and 58% seeking silence. However, 85% reported feeling misunderstood by professionals, and 77% reported feeling helpless. Three key themes emerged: (1) the importance of sensory-based regulation strategies, (2) the impact of environmental factors on emotional well-being, and (3) the need for supports that validate rather than suppress autistic ways of being

Conclusions: Findings emphasise the need to reconceptualise emotion regulation support for autistic people, moving away from standardised approaches toward more personalised, sensory-informed strategies that respect autistic experiences and preferences.

401.119 Emotion Regulation in Autism: A Multi-Stakeholder Investigation of Lived Experiences and Support Preferences

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Background: Understanding emotion regulation in autism requires examining diverse perspectives, yet few studies have simultaneously investigated the views of autistic people, caregivers, and professionals regarding emotion regulation supports.

Objectives: To examine and compare perspectives on emotion regulation supports across three key stakeholder groups: autistic people, caregivers, and health professionals.

Methods: mixed-methods study incorporating surveys (n=45; 26 autistic adults, 19 caregivers) and a Delphi study with health professionals (n=13). Quantitative data analyzed descriptively; qualitative data analyzed using reflexive thematic analysis.

Results: While 92% of autistic participants identified personalized emotion regulation tools as essential, only 20% reported satisfaction with professional support. Caregivers reported significant impacts on family life, with 95% hiding their own emotions during their child's dysregulation. Health professionals demonstrated evolving views toward neurodiversity-affirming practices, with 100% emphasizing the importance of understanding neurodiversity in support provision. Key themes included the need for individualized approaches, the impact of environmental factors, and the importance of moving beyond traditional cognitive-behavioral strategies.

Conclusions: Findings reveal significant gaps between stakeholder perspectives and current support practices, highlighting the need for more neurodiversity-affirming approaches that consider both individual and environmental factors in emotion regulation support.

401.120 Introduction to Healthy Engagement in Autism Research Dialogue (HEARD)

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Background:

In recent years, evolving diagnostic criteria for autism has expanded the diversity of diagnosed individuals. This has led to a wide range of opinions within the autism community about the meaning and implications of a diagnosis. Perspectives vary from those who see autism as an integral part of their identity to those who view it as a condition requiring treatment or support. These differing views sometimes have different priorities, for example, research focused on the prevention of autism vs. lifespan quality of life and wellbeing. Such disagreements have varied in intensity, ranging from respectful discourse to more confrontational exchanges, often heightened by social media interactions.

Objectives:

To address these challenges, the Autism Science Foundation and the Broad Institute established HEARD: Healthy Engagement in Autism Research Dialogue. HEARD brings together a diverse leadership committee of 16 members, including clinicians, researchers, bioethicists, policymakers, self-advocates, and family members of autistic individuals, as well as additional discussants nominated by the leadership committee. The group aims to foster open and respectful conversations on controversial topics in autism research, ensuring that all voices are represented. Approximately half of the leadership committee consists of individuals with direct personal or family experience with autism, guaranteeing that the group's work is grounded in a variety of lived experiences.

The primary goals of HEARD are to: 1) facilitate structured discussions on sensitive research topics within the autism community, 2) develop and disseminate communication strategies for productive dialogue, and 3) expand engagement to include additional community partners, including autistic individuals and emerging researchers.

Methods:

After consultation with researchers engaged in similar endeavors, we developed a set of guiding principles and invited a limited number of autistic and non-autistic researchers who had previously expressed an interest in participating in a dialogue. This included individuals from a global diverse demographic background. Due to geographic diversity, we met virtually and discussed challenges and future directions of these conversations and how they could best be productive. Each discussion was followed by discussant feedback and nomination for topics for future discussions.

Results:

HEARD's initial discussion series for 2023-2024 focused on the role of genetics research in autism, featuring eight sessions that addressed subtopics such as ethics, risk communication, genetic testing, and community partner perspectives. These discussions, moderated by a leadership committee member and an autistic individual, helped refine HEARD's approach to facilitating meaningful engagement. Notes and video recordings were taken and those who were not able to attend in person were able to participate and listen.

Conclusions:

From the discussions that have been conducted, the overarching themes are that this was a very productive method of engaging different communities to discuss scientific topics that have garnered debate. Keeping the group small allowed for individual perspectives to be voiced and heard, however, we realize that this group may not fully represent the spectrum of experiences of autism. Future discussions will include more community members who are not autism researchers and could possibly be inclusive of a wider audience.

401.121 Supporting Caregivers Following Their Child's Neurodevelopmental Diagnosis: A Scoping Review

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Background:

The experience of receiving their child's neurodevelopmental diagnosis and navigating the subsequent steps can be overwhelming for caregivers. A diagnosis can have wide-ranging emotional impacts for caregivers, leaving many feeling uncertain about what to do next. Navigating services to access the recommended therapies, support, and resources can be difficult. This time is particularly challenging for families with limited resources, living in remote or underserved areas, and those from culturally and linguistically diverse backgrounds, exacerbating inequities between families seeking post-diagnostic support. Caregivers globally report that the support offered to them during the post-diagnosis period is inconsistent and inadequate, highlighting the need to better understand current practices and gaps in caregiver support during this critical period.

Objectives:

This scoping review aims to identify and describe existing intervention programs designed to support caregivers in the 12 months following their child's neurodevelopmental diagnosis, with a focus on promoting caregiver or family-related outcomes (e.g., caregiver mental health, well-being, family quality of life). This review also explores the characteristics of these interventions, their outcomes measured, and how these interventions are tailored to meet the needs of diverse populations, including those from culturally and linguistically diverse backgrounds.

Methods:

This review is registered on OSF (DOI: 10.17605/OSF.IO/C8TW3). The scoping review is being conducted in accordance with JBI methodology and adheres to PRISMA-ScR guidelines. A comprehensive search across MEDLINE, Embase, and PsycINFO identified 6,274 articles. Titles and abstracts were screened, followed by full-text review of 241 articles by two independent reviewers based on predefined inclusion and exclusion criteria. Studies examining post-diagnostic caregiver support interventions delivered within 12 months of diagnosis, focusing on improving caregiver or family-related outcomes were included. Studies that focused solely on child-related outcomes or were descriptive or observational in design, and/or lacking a comparator group, were excluded. Data extraction includes key study characteristics (e.g., study design, objectives, inclusion/exclusion criteria), participants (e.g., target population, sample size and characteristics), child information (e.g., age, diagnoses), intervention details (e.g., description, delivery mode, setting), and outcomes. Extracted data is charted and presented in both tabular and narrative formats. Data synthesis employs a descriptive approach to map intervention characteristics, identify patterns, and highlight gaps for future research.

Results:

Data extraction is ongoing, and full results with synthesized findings are expected by February 2025. We anticipate including approximately 10 studies in the final synthesis.

Conclusions:

This scoping review will provide a detailed mapping of existing post-diagnostic support interventions for caregivers of children with neurodevelopmental conditions. The synthesized findings will contribute to identifying gaps in current interventions, highlighting effective strategies, and informing the development of more comprehensive models of post-diagnostic support. These insights will guide future research and practice, aiming to enhance caregiver well-being and family functioning following diagnosis.

401.122 Participation in Practice: Using Workshops for Analysing Research Findings to Improve Accessibility of Cultural Heritage for Neurodivergent Adults

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Background:

Despite a recent movement towards participatory practices in cultural heritage and neurodiversity research, there remains a gap in participatory approaches for enhancing accessibility to these organisations for autistic and neurodivergent adults (AuND). Following high response to the surveys associated with an earlier stage of this participatory PhD project, creative approaches were taken to ensure that experts by lived experience (AuND adults and museum workers) were consulted in finalising the findings. This presentation shall discuss the methodological decisions that informed the development of participatory workshops, how these sessions shaped the direction of research and the lessons learned when utilising qualitative and participatory practices in research to inform changes to benefit AuND people.

Objectives:

To demonstrate the benefits and challenges of working with AuND people using participatory methods to enhance accessibility for traditionally under-served audiences.

Methods:

In-person workshops with: 1) Neurodivergent adults and 2) museum workers.

Participants: 1) two workshops, one formally recorded and one workshop for information held at Autscope for AuND individuals (30 across both workshops). 2) two workshops held at different Scottish Museum Federation (SMF) events for museum workers (many openly AuND) (30 across both workshops). Participants were required to be 18+, and attendance at Autscope (ND-majority conference) and SMF (an organisation for museum workers) ensured they met the criteria for participating.

Presentation slides and participation information was sent in advance. A brief research summary was given using Mentimeter offering opportunities for anonymous responses, as well as printed questionnaires distributed, in room with grouped tables for discussions.

Analysis:

Thematic analysis was applied to qualitative responses (Mentimeter and questionnaires); visualisations of quantitative data were utilised for content analysis. Autoethnographic analysis of discussions in the room, and cross-referencing with data collected in 700 survey responses to assess the generalisability of findings.

Results:

The workshops provided additional information in response to the findings from the survey responses gathered earlier in the research. By presenting the findings to groups of neurodivergent adults and museum workers, and asking for direct feedback while facilitating discussions, I could re-visit code terms and groups to ensure they reflected the experiences and preferences of the community groups that the research was designed to serve. By conducting the workshops in different contexts, and providing different ways to contribute, these led to unexpected discussions about the barriers within museums that prevent museum visiting and addressing systematic barriers from the organisation's perspective.

Conclusions:

The findings from the workshop marked the final phase of this PhD project and will be used for planning the creation of a guidance toolkit for the cultural heritage sector that is informed and co-developed by AuND people, with an openly autistic researcher coordinating the process.

Throughout each stage of this project, AuND adults and museum workers expressed their gratitude for being consulted and their experiences considered. By developing projects that directly involve the AuND community in meaningful ways, both research and real-life practice developments can improve the quality of life for AuND and address the historic under-representation of AuND people in decision-making that impacts their lives.

Poster Session**402 - Brain Function (fMRI, fcMRI, MRS, EEG, ERP, MEG) I**

May 1st, 2025, 12:30 PM - 1:30 PM - Hall 4A

402.123 The Relationship between Brain Activity, Tryptophan-Related Gut Metabolites, and Autism Symptomatology in Autistic Youth

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Background: The gut microbial ecosystem generates an estimated 40% of all metabolites in the body's circulation, including neuroactive and inflammatory molecules. Gut metabolites have been theorized to play a causative role in the pathophysiology of autism spectrum disorder (ASD) via the brain-gut-microbiome (BGM) axis. This hypothesis is based on results from prior research showing differences in gut microbial composition between autistic and neurotypical (NT) populations that correlate with ASD symptoms (Needham et al., 2021). Tryptophan metabolites, such as the neurotransmitter serotonin, have been linked to ASD. Roughly 30% of autistic individuals show elevated blood serotonin levels, which have been linked to the regulation of symptoms such as mood, appetite, and social interactions via vagal afferent signaling (Gabriele et al., 2014; Muller et al., 2015; Schain et al., 1961). Some tryptophan metabolites can cross the blood-brain-barrier and have neuroprotective or neurotoxic effects especially during critical periods of development, potentially influencing brain microstructure, activity and development (Bohar et al., 2015; Pappolla et al., 2021; Chen et al., 2021; Cherkova et al., 2021). Although prior research has found correlations between tryptophan metabolites and behavior in ASD, alterations in how the human brain interacts with gut metabolites in ASD have not been examined. As the brain controls behavior, to fully understand the implications of dysregulation of the brain-gut-microbiome (BGM) axis in ASD, the brain must be considered.

Objectives: The objective of this study was to assess group differences in tryptophan metabolites and study the association between metabolite levels, neural activity during socio-emotional and sensory tasks, and behavior in ASD and NT children. We additionally explored whether neural activity was a mediator between metabolite levels and behavior.

Methods: 43 ASD (32 Males, AgeM=12.06) and 41 NT children (21 Males, AgeM=11.86) underwent task-based functional magnetic resonance imaging (fMRI), provided fecal samples, and completed behavioral assessments. General linear models were applied to examine group differences in tryptophan metabolites and to assess the associations between tryptophan metabolites and evoked brain activity and behavior. Age, sex and body mass index were included as covariates. The Benjamini-Hochberg method to correct for multiple comparisons was used with the threshold set at 10%. Mediation modeling was performed to assess whether the neural activity was a mediator of metabolites and behavior.

Results: The NT group had significantly higher levels of the tryptophan metabolite kynurenate compared to the ASD group ($q < 0.10$). Specifically in the ASD group, metabolites were significantly negatively associated with: brain activity in the insula and cingulate, autism severity, sleep quality, and sensory sensitivities and positively associated with disgust sensitivity (Figure 1; $q < 0.10$). Mediation analyses in the ASD group found that activity in the mid-insula and mid-cingulate significantly mediated relationships between the metabolites, indolelactate and tryptophan betaine, and ASD severity (Figure 1).

Conclusions: This study supports prior research implicating dysregulation of the BGM axis, specifically related to the tryptophan pathway, in ASD. To our knowledge, this is the first study to elucidate how interactions between gut metabolites and brain activity may impact autism symptomatology.



402.124 Visual Evoked Potentials in Autism and ADHD As a Neurophysiological Metric of Sensory Sensitivities in Young Children
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Background:

Early sensory response differences exist in both autistic individuals and those with ADHD. The visual evoked potential (VEP) paradigm uses a rotating checkerboard to measure early visual processing and the balance of cortical excitation and inhibition. In sensory processing disorders like synesthesia, early component amplitudes are reduced. VEP results vary with age, showing decreasing amplitudes and latencies up to age 30. Studies in autistic cohorts indicate reduced P1 amplitude, suggesting sensory sensitivities impact these associations. Delayed N1 latency has also been observed in autistic individuals, while P1 reduction occurs in those with ADHD compared to typical peers. Despite neurophysiological differences seen during the VEP paradigm in both autistic and ADHD populations independently, responses to VEP in autistic individuals with co-occurring ADHD are limited. Current evidence indicates reduced P1 amplitude in comparison to autistic children without ADHD and neurotypical children.

Objectives:

This study aims to (1) investigate group differences in the P1 and N1(amplitude & latency) between autistic children, children with ADHD, and autistic children with co-occurring ADHD in reference to neurotypical peers and (2) understanding how group differences in the P1 and N1 are related to caregiver reported sensory processing differences.

Methods:

Participants were ages 3-7 years old from 4 groups: neurotypical, ADHD, autism, and co-occurring autism and ADHD. Participants (N = 96) were included in the VEP analysis if the following criteria were met: (1) <16 channels interpolated, (2) <33% bad channels in midline occipital, (3) >33% good trials and (4) valid morphology. VEP stimuli consisted of two black and white checkerboards that reversed phase. Mean amplitude and latency of the N1 and P1 peaks were derived using MATLAB 2024a with epochs of -100-300 ms and artifact rejection of $\pm 200 \mu V$.

Autism and ADHD features were assessed via caregiver report on the Social Responsiveness Questionnaire-2 (SRS-2) and the Attention Deficit/Hyperactivity Disorder-RS (ADHD-RS), respectively. Finally, sensory Hyper/Hypo-responsivity were assessed using the caregiver completed Sensory Experience Questionnaire. Data was analyzed in RStudio using linear models (Eq.1). Model covariates are summarized in Table 1.

Results:

As age increased autistic children exhibited a decrease in P1 amplitude, while children with ADHD demonstrated an increase in N1 amplitude, in comparison to neurotypical children ($p < 0.001$ & $p < 0.02$). This pattern was observed irrespective of any co-occurring diagnoses. When exploring autism and ADHD features (via caregiver report), the ADHD group showed decreased P1 amplitudes as SRS-2 scores increased ($p < 0.02$).

Increased ADHD symptoms associated with earlier N1 latency ($p = 0.025$).

In children with ADHD, hyper-responsivity scores didn't change P1 latency, but did in neurotypical children, with higher hyper-responsivity scores leading to earlier latencies ($p < 0.03$ & $p < 0.01$). Individuals with co-occurring autism and ADHD showed no significant differences from neurotypical peers.

Conclusions:

Children with ADHD exhibited increased excitation and reduced inhibition in response to visual stimuli. Similarly, autistic children showed signs of reduced inhibition to VEP stimuli, along with relatively stable excitation levels (unless co-occurring ADHD was present). These findings further reinforce the notion that reduced P1 amplitude could serve as a reliable biomarker associated with autism.



402.125 A New Paradigm for Autism Spectrum Disorder Discrimination in Children Utilizing EEG Data Collected during Cartoon Viewing with a Focus on Atypical Semantic Processing

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Background: ASD is a prevalent neurodevelopmental disorder with early onset, affecting individuals across their lifespan. Early diagnosis is crucial for improving outcomes, but existing diagnostic methods are time-consuming and labor-intensive. This highlights a significant gap—the need for more efficient and cost-effective auxiliary diagnostic tools that can be readily implemented in clinical settings.

Objectives: To address this gap, we developed a novel, child-friendly discrimination paradigm utilizing EEG data collected during cartoon viewing to assess atypical semantic processing in children with ASD.

Methods: We employed a machine learning algorithm that combines pre-trained language models with regression techniques. Furthermore, we investigated the preferences and neural mechanisms underlying atypical semantic processing across various word dimensions using the Six-Dimensional Semantic Database (SSDD) system and EEG topographic mapping.

Results: Our method demonstrated high sensitivity (91.3%) and moderate specificity (61.0%) in screening for ASD. Notably, the visual dimension significantly contributed to ASD detection ($p = 0.001$). EEG signals originating from the right temporal lobe were pivotal in distinguishing children with ASD from typically developing peers.

Conclusions: This innovative approach offers a promising pathway toward developing more accurate and efficient auxiliary discrimination tools for ASD. By integrating neuroimaging data with semantic processing analysis, our method provides a multifaceted understanding of ASD characteristics. This paradigm not only enhances the potential for early diagnosis at the grassroots level but also opens new avenues for targeted interventions and future research in ASD.



402.126 Abnormal Functional Hierarchy Development during Childhood in Autism

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Background:

Autism is a disorder affecting information processing across multiple functional domains, exhibiting distinct differences in perception, emotion, and higher cognitive development compared to typically developing children. These differences suggest potential developmental anomalies in the functional hierarchy. Early research points to abnormal connections between low-level sensory processing and higher cognitive functions in autistic children, potentially causing imbalances in information processing, which affect behavior and learning. However, the exact developmental patterns of the functional hierarchy in autistic children are still unclear.

Objectives:

To investigate the developmental patterns of functional hierarchy in children with ASD and typically developing children, and to identify potential developmental abnormalities in children with autism.

Methods:

We employed a large functional MRI dataset comprising 476 children aged under 13 years old from the Shanghai Autism Early Development (SAED) Cohort, including 200 NC children (aged 1.04-12.93 years, 42.0% males), 276 ASD children (aged 1.67-12.87 years, 79.3% males). We performed gradient decomposition analysis on the voxel-level functional connectivity matrices of different age groups and plotted scatter plots of the core gradients. To explore the longitudinal changes in the global topography and regional gradient scores of the functional connectivity gradient, we also performed an cross-participant age sliding window analysis. Subsequently, we calculated the convex hull areas of different networks and the distances between networks in the scatter plots of core gradient scores, and fitted their relationship with age to explore whether developmental abnormalities exist in the functional hierarchical structures of autism children. Finally, for each voxel, we calculated the age at which the core gradient reached its peak to generate a maturation map. We then compared the average gradient maturation age across different networks between ASD and typically developing (NC) children.

Results:

In early and mid-childhood, the visual-sensorimotor gradient dominated in both the NC and ASD groups (Fig. 1A-B). In late childhood (11.0-13.0 years), the NC group exhibited a transition to the primary-to-transmodal gradient, which was less evident in the ASD group (Fig. 1A-D). Age sliding window analysis (Fig. 1E) revealed that in the NC group, the explanation ratio of the visual-sensorimotor gradient gradually decreased ($t = -2.44$, $p < 0.05$), while the explanation ratio of the primary-to-transmodal gradient gradually increased ($t = 4.94$, $p < 0.01$), becoming dominant around age 12. In contrast, the ASD group showed no significant age-related change in the primary-to-transmodal gradient ($t = -0.585$, $p = 0.561$). Furthermore, the range of the primary-to-transmodal gradient in the ASD group showed a reduction related to age ($t = -2.92$, $p < 0.01$). We then found that the somatosensory network, dorsal attention network, and ventral network in the ASD group were abnormally developed in the core gradient structure (Figure 2A-B). Finally, we found that there were significant differences between the ASD and NC groups in the functional maturation patterns of the first two core gradients (Figure 2C-D).

Conclusions:

These results suggest that children with ASD exhibit atypical developmental patterns in the functional hierarchy, particularly in the primary-to-transmodal gradient and key brain networks, compared to typically developing children.

**402.127** Neural Symmetry in Parent-Child Dyads with Autistic and Non-Autistic Children

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Background: Hyperscanning, the simultaneous recording of brain activity from interacting participants (Duane & Behrendt, 1965), provides insight into neural dynamics underlying parent-child interactions. Our understanding of how these dynamics differ when a child is autistic is conflicting, as few studies have used hyperscanning with neurodiverse parent-child dyads (see Zhou & Wong, 2024). Studies on inter-brain dynamics typically focus on coordinated patterns of neural activity, often termed synchrony. However, “symmetry” may be a more term appropriate given the range of associations that occur (Sjoberck et al., 2024).

Objectives: (1) Examine length and variability of symmetry segments and time lag of associations between dyads’ neural activity during turn-based and continuous interactions. (2) Examine how symmetry segments and lags may differ based on child’s autism status and similarity of parent-child autistic traits (AT).

Methods: Participants were 39 parent-child dyads (14 autistic, 25 non-autistic children), with children averaging 8.43 years (6–11 years; 33% female). Parents completed the Autism Quotient (AQ) for themselves and the AQ Child for their child.

EEG data were recorded using Cognionics dry wireless Quick-20m headsets at 500Hz while dyads engaged in musical freeplay (MF) and a musical patterns (MP) task.

During MF (5 minutes), dyads played instruments together as if they were at home. During MP (5 minutes), parents played a short xylophone pattern, their child copied, then both participants played the pattern together. Participants alternated roles throughout MP.

EEG artifacts were removed via a preprocessing pipeline including band pass filtering, bad channel detection/interpolation, and independent components analysis (Bigdely-Shamlo et al., 2015).

We used Windowed Cross Correlations (WCC; Boker et al., 2002) and the Pairwise Approximate Spatiotemporal Symmetry (PASS) algorithm (Sjoberck et al., 2024) to analyze associations between dyad members’ EEG signals. WCC measures the strength and lag of these associations over time. The PASS algorithm identifies segments of symmetry in paired time series. Multi-level models examined dyadic symmetry using task, child autism status, and parent-child AT similarity as predictors.

Results: Dyads with autistic children showed greater mean lag variability ($b=3.54$, $p=.024$). Greater differences in ATs predicted lower lag variability for dyads with autistic children ($b=-0.10$, $p=.045$).

Dyads with an autistic child exhibited longer symmetry segments than those with non-autistic children ($b=3.39$, $p<.001$) and shorter segments during MP compared to MF ($b=-0.95$, $p=.001$). Greater differences in parent-child ATs predicted longer symmetry segments during MP ($b=0.05$, $p<.001$).

Dyads with an autistic child had more variable symmetry segment lengths ($b=204.83$, $p<.001$). Segment length was more variable during MF ($b=-43.80$, $p=.009$), particularly for dyads with autistic children ($b=-57.43$, $p=.03$). Greater similarity in parent-child ATs predicted increased segment length variability in dyads with autistic children ($b=-3.41$, $p=.028$; Fig 1). Greater dissimilarity in ATs predicted increased segment length variability during MP ($b=2.31$, $p=.001$; Fig 2).

Conclusions: This study highlights how child autism status and interaction demands influence parent-child neural dynamics. Effects are moderated by similarity of AT between parents and children, a potentially fruitful area for further research.



402.128 Altered Functional Connectivity Hub Patterning across the Sensory-Association Axis in an Autism Subtype with Low Levels of Language, Intellectual, and Adaptive Functioning

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Background:

Prior work has shown that early developing non-core language, intellectual, motor, and adaptive functioning (LIMA) features may be important for identifying phenotypically distinctive autism subtypes that are also different in their underlying neurobiology (Mandelli, Severino et al., 2024). Here, we extend this subtyping work on older individuals and investigate whether it can identify subtypes with different functional connectomic organization.

Objectives:

Here we utilize phenotypic measures of non-core language, intellectual, and adaptive functioning features to develop a stratification model applied to individuals older than 5 years of age and then test whether these subtypes show difference at the level of resting state fMRI global functional connectivity.

Methods:

Phenotypic measures of verbal and non-verbal intelligence (e.g., Wechsler, DAS) and adaptive functioning (e.g., Vineland) were obtained from $n=419$ autistic individuals from the National Institute of Mental Health Data Archive (NDA) for the purposes of building and validating a phenotypic stratification model of autism. Stratification models were tested using stability-based relative clustering validation (*reval*; Landi, Mandelli, & Lombardo, 2021). To examine resting state fMRI global functional connectivity, we utilized available data with similar intelligence and adaptive functioning phenotypic measures from the Autism Brain Imaging Data Exchange (*ABIDE*) and Gender Exploration of Neurogenetics and Development to Advance Autism Research (GENDAAR) datasets ($n=186$ typically developing; $n=174$ autism, age: 5-39 years). Global functional connectivity was estimated for each region from the HCP-MMP parcellation using weighted degree centrality as the metric for global functional connectivity. Standard preprocessing was implemented along with wavelet-based denoising to help mitigate motion-related artifact. ComBat was utilized to remove site-related effects on connectivity. Linear modeling was used to statistically test for differences related to subtype, sex and age, while covarying for mean framewise displacement and eyes open versus closed conditions. Multiple comparison correction was achieved using an FDR $q<0.05$.

Results:

Two autism subtypes were identified as the optimal clustering solution, and this 2-subtype model achieved 92% generalization accuracy in an unseen validation dataset. The two subtypes can be described as relatively high versus low on all phenotypic non-core features. A main effect of subtype was observed in global functional connectivity, which was driven by the low subtype showing hyperconnectivity in social brain default mode related areas (e.g., PCC, MPFC) alongside hypoconnectivity in sensory areas (e.g., visual, auditory).

Conclusions:

This work demonstrates that autism subtypes defined by non-core language, intellectual, and adaptive functioning features can be robustly identified in individuals beyond the age of 5 years. This subtype distinction was helpful in isolating a specific pattern in the low subtype of hyperconnectivity in social brain circuitry and hypoconnectivity in sensory-related areas. Such differential patterning of hub-related connectivity measures across sensory-association axes may be important in pointing towards differential biological mechanisms related to cortical patterning in autistic individuals with relatively low levels on non-core features.

402.129 Anomalous Pattern of Left Hemisphere Visual Connectivity in Children with Autism: Association with Impaired Praxis
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Background: Prominent theories of autism suggest autism-associated differences in visual-motor integration (VMI) may disrupt learning of motor and social skills typically acquired by observation and imitation. Supporting these theories, children with autism spectrum disorder (ASD) show robust differences in motor tasks reliant on dynamic VMI (e.g., ball-catching and motor imitation) and anomalous visual-motor connectivity between higher-order visual (HOV) and sensory-motor cortices. Use of functional MRI (fMRI) to examine HOV functional connectivity (FC) has been particularly revealing with other conditions. For instance, research with congenitally blind adults reveals a particular pattern of altered HOV connectivity, showing reduced HOV connectivity with primary sensory-motor (SM1) and primary auditory (A1) cortices yet "compensatory" increased connectivity between HOV and prefrontal cortex (PFC).

Objectives: Informed by these findings, we used fMRI to examine HOV FC in children with ASD, hypothesizing they would show a distinct pattern of HOV connectivity relative to typically developing (TD) children, with decreased HOV-SMC connectivity (but no alterations in HOV-A1 connectivity) and increased "compensatory" HOV-PFC connectivity. We further hypothesized that this altered pattern of HOV connectivity would correlate with autism-associated difficulties with performing skilled actions ("praxis"); often learned through visual imitation.

Methods: 427 children, 127 ASD (27 girls) and 300 TD (98 girls) aged 8-12 years completed resting fMRI on a 3T Philips scanner and were included if there was 5 minutes of continuous usable data (3mm of translation and 3 of rotation). Praxis was measured using the Florida Apraxia Battery modified for children. Seed-based analyses were performed using an in-house pipeline, which included nuisance regression (aCompCor). Inter-regional FC was assessed between HOV, SM1, A1 and PFC ROIs as defined in a previous study (Tian et al., 2024). Multiple linear regression models examined diagnosis-by-ROI interactions. Separate multiple linear regression models were applied to each ROI to examine diagnosis and diagnosis-by-age interaction effects. Model covariates included handedness, IQ (GAI), sex, and head coil.

Results: A significant diagnosis-by-ROI interaction was observed between HOV-PFC and HOV-SM1 connectivity ($p=0.04$). Compared to TD children, those with ASD showed reduced HOV-SM1 connectivity and greater HOV-PFC connectivity. Examining left and right hemispheres independently, revealed significant in left hemisphere ($p=0.0006$) and not right hemisphere ($p=0.32$). No diagnosis-by-ROI interaction was observed between HOV-PFC and HOV-A1 connectivity ($p=0.92$). Associations with praxis revealed a significant diagnosis-by-HOV-SM1 connectivity interaction for praxis average total errors in left hemisphere ($p<0.0001$), where increased HOV-SM1 connectivity was associated with better praxis for ASD, but worse praxis for TD; overall model $R^2=0.496$, $p<0.0001$.

Conclusions: Our finding suggests ASD children show an altered pattern of higher-order visual (HOV) connectivity that is characterized by reduced HOV connectivity with primary sensory-motor cortex (SM1) yet increased connectivity with prefrontal cortex (PFC). Further, this HOV connectivity correlated with impaired praxis in children with ASD, suggesting that altered patterns of HOV connectivity may contribute to difficulty acquiring a range of skilled behaviors observed in autism.

402.130 Aperiodic Activity in Resting State EEG Differentiates Autistic and Schizophrenic from Non-Autistic Groups.

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Background:

Traditional EEG analyses measure spectral power within distinct frequency bands associated with specific cognitive states (i.e., periodic power). Measuring oscillations requires an assumption about activity observed within a predefined frequency band, which disregards individual variance. However, non-oscillatory signals (i.e., aperiodic power), often treated as noise, can affect power spectrum calculations and provide informative data. Aperiodic activity is accounted for by calculating the slope of the power spectrum—the rate of decay in spectral power as a function of frequency—which follows the natural decrease in power observed at higher frequencies in humans (i.e., a negative slope). Recent studies have identified aperiodic brain activity as a reliable predictor of neurodevelopmental conditions, including schizophrenia and autism. Among autistic and non-autistic participants, individual aperiodic power spectra identified patterns of activity that complemented results of a non-parametric model and discriminated between the two groups.

Objectives:

The current study aimed to evaluate aperiodic activity derived from resting EEG as a meaningful predictor of clinical diagnosis across adults with autism, schizophrenia, or no neuropsychiatric condition.

Methods: Resting state EEG was recorded from 59 adults with autism (ASD; 47 men, 12 women; 17.9–43 years, $M = 25.0$, $SD = 6.1$), 42 with schizophrenia or psychosis (SZ; 37 men, 5 women; 19.2–43.6 years, $M = 25.5$, $SD = 5.5$), and 61 with no known neuropsychiatric disorder (NT; 35 men, 26 women; 18.3–46.6 years, $M = 26.4$, $SD = 6.3$). EEG was recorded for 80 seconds while participants' eyes were closed. Power spectrum densities were calculated across all electrodes. Linear regression was applied to frequency and median power to derive the slope for each participant. Participants' slopes were submitted to linear regression with group as a predictor

Results:

Power spectrum density slopes (i.e., oscillatory + aperiodic activity) were affected by group diagnostic status, $F(2, 151) = 3.69$, $p = 0.03$, $R^2 = 0.05$. Compared to TD participants, slopes were significantly more negative among ASD ($= -0.0014$, $p = 0.01$) and SZ ($= -0.0013$, $p = 0.04$) groups. There was no difference between ASD and SZ groups, ($= 0.0001$, $p = 0.84$).

Conclusions:

In this transdiagnostic sample, aperiodic EEG effectively differentiated between clinical and non-clinical groups. Specifically, autistic and schizophrenic participants had a steeper decay in slope compared to those without a neuropsychiatric condition, consistent with prior studies. This pattern may be indicative of less efficient neural processing, differences in connectivity, or an imbalance between excitatory and inhibitory neural firing (i.e., stronger low-frequency oscillations relative to high-frequency activity). Greater variability in EEG signals has been reported in both autism and schizophrenia which may explain the absence of a difference in slope values between the two clinical groups. Indeed, both conditions share similar patterns of atypical functional connectivity as well as comparable behavioral traits, cognitive impairments, and genetic variants. Additional study of oscillatory and non-oscillatory neural patterns may help elucidate the biological underpinnings of autism and schizophrenia.

402.131 Assessing Whether Affinities Elicit Different Neural Activation Patterns in Autistic and Neurotypical Young Children

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Background: Research has shown that the brains of autistic individuals process spoken language differently than that of neurotypical individuals. Previous neuroimaging work suggests reduced activation in left-lateralized frontal and temporal regions of the brain, including the bilateral frontal and temporal gyri and the temporoparietal junction (TPJ), may contribute to the development of language differences in ASD. It remains unknown if the affinities of autistic and neurotypical (NT) children change their neural responses to language.

Objectives: We investigated whether autistic and NT children demonstrated differences in neural activation, beyond what is explained by receptive language ability, when listening to stories that contained reference to either their affinity or a neutral topic.

Methods: Participants included 14 autistic children ($M_{age}=5.35$ years, $range = 3.8-6.9$, $M_{receptive\ language\ SS}=90.4$) and 13 NT children ($M_{age}=5.12$ years, $range = 3.7-6.1$, $M_{receptive\ language\ SS}=121.0$). Receptive language skills were measured using the Preschool Language Scales (PLS-5). Functional near-infrared spectroscopy (fNIRS) was used to measure children's brain function while they listened to two different stories read by a live experimenter. One story included the child's affinity (e.g., Bluey), while the other story did not (neutral). Each story included 15 trials which were 10 seconds each. Oxygenated hemoglobin concentration values (HbO) were averaged over 0-to-10 seconds (trial length). We performed correlation analyses between HbO and PLS scores, and paired samples t-tests comparing conditions (Affinity/Neutral) within groups (ASD/NT). Finally, we ran linear regression models for hypothesized ROIs to see whether group predicted HbO when controlling for receptive language skills and age.

Results: Paired samples t-tests yielded a significant differences in the right TPJ (rTPJ) in the NT group, wherein HbO for the affinity condition was significantly greater than the neutral condition (Figure A; $t(10)=2.67$, $p=0.031$), and the superior and middle temporal gyrus (SMTG) in the NT group, wherein HbO for the affinity condition was significantly greater than the neutral condition (Figure B; $t(9)=2.47$, $p=0.046$). One linear regression was significant; NT kids show significantly less deactivation than ASD kids in the left IMFG during the affinity condition when controlling for receptive language abilities and age (Figure C; $p=.027$). Correlation analyses demonstrated one significant, strong correlation between receptive language and HbO in the rTPJ for the affinity condition within the autistic group ($r=.69$, $p=.023$).

Conclusions: NT participants showed significantly greater activation in the left SMTG and rTPJ during the affinity condition, suggesting that brain regions involved in language processing, attentional control, and mentalizing were more active during affinity stories. Significantly greater deactivation of the left IMFG in the ASD group suggests that autistic kids show greater social attention during the affinity condition, as deactivation of the frontal gyri has previously been associated with attention to socially relevant information. The strong positive association between receptive language and rTPJ activation in the autistic group suggests the role of attention in both PLS and book reading tasks and/or that autistic kids with higher receptive language are mentalizing more with the live reader or characters in affinity condition. Findings may inform whether affinities can be leveraged in language interventions for different neurotypes.



402.132 Assessment of Bilateral Hearing Loss in a Minimally Verbal Autistic Female Using Auditory Event-Related Potentials: A Case Study

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Background:

Minimally verbal autistic children (MVA; e.g., use less than 20 spoken words; Koegel et al., 2020) make up ~30% of the autistic population. A small part of the autistic population (i.e., up to 3.5%) is also considered deaf or hard of hearing (DHH). Both autism and hearing loss are known contributors to altered communicative functioning, but little is known about DHH autistic children beyond clinical features and challenges with obtaining accurate diagnosis (Shield, 2014). Auditory event-related potentials (ERPs) are a promising approach to assessing language processing in MVA (Tager-Flusberg & Kasari, 2013) and have been previously used to document the effects of amplification in pediatric hearing loss (Key et al., 2010).

Objectives:

A primary objective of this pediatric case study was to determine the impact of hearing amplification and intensive behavioral intervention on receptive communication in MVA with hearing loss.

Methods:

A 5-year-old MVA female with completed behavioral and ERP measures to assess the impact of hearing amplification on speech processing during intensive intervention targeting social communication. She passed her newborn hearing screening and a sedated ABR was conducted due to limited growth in receptive language despite intensive intervention. She subsequently received her hearing loss diagnosis in early 2024, but the cause and timing of hearing loss is unknown. A passive listening ERP protocol (presented in sound field, at 75 dB SPL) evaluating sound onset detection, speech sound discrimination (consonant-vowel syllables with varied place of articulation), and known word recognition was completed along with behavioral measures at 2 (Time 1) and 4 (Time 2) months after hearing aid acquisition. All data were collected in the aided condition with both hearing aids at their regular settings. Between study visits, receptive (e.g., one-step instructions) and expressive tasks (i.e., via speech generating device and introduction of sign language).

Results:

At Time 1, behavioral measures indicated expressive and receptive skills fell between 18-30 months. ERP data indicated age-appropriate P1-N1-P2 response to sound onset, confirming that the hearing aids' amplification was sufficient for the auditory input to reach the auditory cortex. However, evidence of speech sound and word-nonword discrimination (frontal P3a and left temporal negativity at 200-500 ms) was limited, consistent with limited experience with sound. At Time 2, the ERPs replicated the sound detection and speech discrimination findings while word-nonword amplitude differences emerged at the right temporal sites. While immature relative to chronological age, that finding was consistent with prior observations in younger language learners (Mills et al., 2014), including those at risk for autism (Kuhl et al., 2013).

Conclusions:

Findings demonstrate that increased auditory experience with speech following access to hearing technology in MVA children with hearing loss may facilitate development of receptive communication abilities, as has been previously reported in children with hearing loss without autism. Results highlight the importance of identifying and treating hearing loss in MVA children who are not making progress on receptive tasks and demonstrate the utility of ERP in assessment of language processing for these children.

402.133 Atypical Cerebellar Functional Connectivity Gradient in Autism Spectrum Disorder

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Background: An increasing body of research indicates that the cerebellum, functioning as a central hub within the nervous system, is associated with the onset and progression of autism spectrum disorder (ASD). Similar to the cerebrum, the cerebellum exhibits a gradient organization, which underscores its spatial characteristics and developmental transformations. Although prior studies have documented changes in functional connectivity gradients within the cortical structures of individuals diagnosed with ASD, the characteristics of these gradients in the cerebellar cortex, as well as the interconnections between the cerebellum and the cerebral cortex, remain unclear.

Objectives: This study aims to explore the characteristics of the functional connectivity gradient along the cerebellar cortical and cerebellar-cerebral pathways in individuals with ASD.

Methods: Subjects with acceptable T1-weighted magnetic resonance imaging (MRI) and resting-state MRI (rs-MRI) images were selected from the Autism Brain Imaging Data Exchange (ABIDE) I and II databases. We choose NettekovenAsym128 to down-sample voxel-based rs-MRI data considering the asymmetric nature of cerebellar functional organization and its dissociation from anatomical structure. For the cerebral cortex, we choose multimodal parcellation (MMP). After parcellating the preprocessed time series, we computed the rs-Function connectivity (FC) matrix for each individual using Fisher Z-transformed Pearson correlations between parcels. For the intra-cerebellar pattern, the first three eigenvectors reflect sensorimotor-association gradient (G1), VIII-vermis gradient (G2), and superior-ventral inferior gradient (G3). For the cerebellar-cerebral pattern, the first three eigenvectors are sensorimotor-association gradient (G1), left-right default gradient (G2), and visual-soma motor gradient (G3). We calculated three global measures that can quantify gradient developmental properties. The linear mixed model incorporated main effects of diagnostic group and age group, their interaction, and full-scale intelligence (FIQ) as covariates. We took a multivariate approach using Hotelling's T to discover shared effects across three eigenvectors.

Results: The final sample included 419 males aged 6 to 35 years (174 ASD vs. 245 typically developing controls [TDC]), which was further divided into three age groups: 218 children (6–12 years; 88 ASD, 130 TDC), 112 adolescents (12–18 years; 51 ASD, 61 TDC), and 89 young adults (18–35 years; 35 ASD, 54 TDC). We compared gradient scores along the first three functional organizational axes of cerebellar between individuals with ASD and TDC within the total sample, which indicated group differences in bilateral IX for intra-cerebellar patterns, and left lobules Crus I, VIIB-X, and right VI, VIIIA-X in cerebellar-cerebral patterns. Significant group differences were found in intra-cerebellar patterns, cerebellar-cerebral patterns and single-gradient analyses ($P_{FDR} < 0.05$), as refer to **Figure 1**. Furthermore, we found that the gradient changes in ASD were less pronounced with increasing age. The interaction effects of age group with the status of ASD primarily observed in left lobules VIIB-X and right lobules VI-VIIIB, IX for the intra-cerebellar pattern. In contrast, the cerebellar-cerebral pattern was evident in left the lobules VI-Crus I, VIIIA-VIIIB and right lobules VIIIA-IX.

Conclusions: Our findings indicated that there were significant differences in gradient scores on the cerebellar functional organizational axes between individuals with ASD and TDC, and these differences decrease with increasing age.

**402.134** Autism Subscores Are Correlated with Tuber Functional Connectivity to Right Cerebellar Crus V in Tuberous Sclerosis Complex

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Background:

Autism spectrum disorder (ASD) is a neurodevelopmental condition affecting 1:54 people in the United States that results in altered social communication, restrictive/repetitive patterns of behavior, interests, and activities. Individuals with Tuberous Sclerosis Complex (TSC), a rare genetic disorder resulting from TSC1/TSC2 mutations, are at high risk of developing ASD (40%) and have focal brain lesions present from birth that affect surrounding brain tissue function. Because ASD in individuals with TSC is behaviorally indistinguishable from idiopathic/non-syndromic ASD, these individuals may provide unique lesion-based insight into the neuroanatomical substrate of ASD symptoms.

Objectives:

To examine networks in the brain related to autism severity and severity of different autism characteristics.

Methods:

This research draws on information from the TSC Autism Centers of Excellence Research Network (TACERN), comprising 115 individuals with Autism Diagnostic Observation Schedule (ADOS) data along with structural neuroimaging data. We applied lesion network mapping, a technique that identifies brain circuits associated with lesions like cortical tubers, to explore the relationship between specific ADOS variables and networks associated with these tubers. For comparative analysis, we referenced normative data from 1,000 nine-year-olds from the Adolescent Brain Cognitive Development Study.

Results:

We found that the localization of functional connectivity networks associated with the overall autism severity score was somewhat limited. However, when we analyzed the subscores for social affect (SA) and repetitive restrictive behaviors (RRB), we identified a correlation between SA scores and increased functional connectivity in the right cerebellar Crus V region, which is linked to both primary and secondary motor areas. Furthermore, the variance associated with RRB severity appeared to be largely independent of SA.

Conclusions:

We found a significant correlation between social affect and the activation of a specific network associated with bilateral somatomotor and cerebellar regions. In contrast, no correlation was observed when looking at total ADOS scores, which may help explain the diverse findings in neuroimaging studies that focus only on overall autism severity. Our findings emphasize a specific brain network tied to social affect in TSC-related autism, which could also be relevant for cases of idiopathic or non-syndromic ASD.

402.135 Brain Anatomical and Functional Study in Children Carrying De Novo Pathogenic ARID1B Mutations

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Background: Autism spectrum disorders (ASD) and intellectual disability (ID) are common neurodevelopmental conditions that present unique challenges. Mutations in the ARID1B gene can lead to various neurodevelopmental disorders, including Coffin-Siris syndrome or isolated ID, often accompanied by behavioral challenges like ASD and distinct physical features (e.g., underdeveloped fifth fingers or toenail abnormalities). Despite the established role of ARID1B in these conditions, MRI studies focusing on pediatric populations with ARID1B mutations remain limited.

Objectives: This study aims to investigate anatomical and perfusion abnormalities in the brains of children with ASD and de novo ARID1B pathogenic variants and to explore the relationship between these genetic mutations, the children's cognitive profiles, and their brain abnormalities.

Methods: We retrospectively included 24 ASD patients with de novo ARID1B pathogenic variants (mean age: 10.5 ± 8.9 years, range: 1–19 years), all of whom underwent MRI at Necker Children's Hospital. Of these, 7 patients (mean age: 12.56 ± 5.4 years) who underwent 3T MRI-scanning had both 3DT1 and Arterial Spin Labeling (ASL) sequences, which respectively measure brain structures and cerebral blood flow (CBF) at rest. Additionally, 25 healthy subjects (mean age: 11.51 ± 4.1 years) with 3T MRI scans were included from our database. A neuroradiologist conducted a visual analysis of the 3DT1 anatomical scans of the 24 patients. To examine grey matter differences between patients and controls, we performed voxel-based morphometry (VBM) using a whole-brain approach with 3DT1 images. We also assessed brain perfusion differences by comparing resting CBF using a voxel-wise analysis between the two groups. All statistical analyses were performed using SPM12 with age as a covariate, and significance was set at $p \leq 0.05$, FWE-corrected. Cognitive assessments included the Wechsler Intelligence Scale for Children (WISC-V) and a Developmental Neuropsychological Evaluation (NEPSY-II) to assess delayed memory.

Results: Visual analysis identified corpus callosum abnormalities in all 24 patients, with 18 showing also a posterior fossa arachnoid cyst. VBM analysis revealed a significant bilateral increase in grey matter in the posterior cingulate of patients with ARID1B pathogenic variants compared to healthy controls ($p < 0.05$). The ASL study indicated a significant increase in CBF in bilateral hippocampal regions in patients compared to controls ($p < 0.05$ cor). Cognitive assessments revealed that all 7 patients had ID but demonstrated strong memory performance, with all scoring above the 50th percentile in visual memory and 4 scoring above the 75th percentile.

Conclusions: Our findings show increased grey matter density in the posterior cingulate, a critical region of the Papez circuit, and heightened CBF in both hippocampi, which is associated with visual and spatial memory. These anatomical and functional results align with the observed neuropsychological profiles. The high memory scores suggest a significant dissociation between visual memory performance and overall cognitive abilities. An ongoing larger prospective study, including episodic memory tests, aims to further investigate phenotype-genotype correlations and will provide a comprehensive understanding of the clinico-radiological aspects of ARID1B pathogenic variations.



402.136 Brain Function Underlying Naturalistic Motor Observation and Imitation in Autistic and Non-Autistic Individuals

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Background: While autism spectrum disorder (ASD) is principally defined by deficits in social-communicative functioning with restricted interests and repetitive behaviors, autistic individuals often show early motor impairments that persist through childhood and into adulthood. Especially prominent among these ASD-associated motor features is difficulty imitating others' actions. Elucidating brain function underlying autism-associated behavioral differences in motor imitation has proved challenging due to constraints with functional MRI (fMRI). High-density diffuse optical tomography (HD-DOT) overcomes logistical challenges of fMRI, providing an open scanning environment conducive to neuroimaging during gross motor imitation.

Objectives: We aim to investigate brain-behavior associations underlying motor observation (OBS) and imitation (IM) in autistic and non-autistic control (NAC) adults and school-age children.

Methods: Participants, including 72 children (7-17 years; 32 ASD) and 103 adults (18-74 years; 19 ASD), performed OBS and IM tasks while being imaged with HD-DOT (**Table 1 and Fig. 1A-C**). Participants observed or imitated videos of an actor completing sequences of meaningless arm movements while being recorded using Kinect 3D cameras for computer-vision-based assessment of motor imitation (CAMI, **Fig. 1D**). General linear models were used to compute beta values of the HD-DOT-measured brain responses relative to rest (e.g., task>rest) with group-level random effects t-tests calculated for OBS, IM, and their contrast (IM>OBS). False discovery rate correction was used to control for multiple comparisons. We also applied multiple regression to investigate brain-behavior associations with both autistic traits, using the Social Responsiveness Scale - Version 2 (SRS-2), and CAMI (**Fig. 1E**).

Results: The adult group statistical maps for both tasks exhibit expected activations in visual and temporal cortex, with additional motor cortex activation during imitation (**Fig. 1F, G**). Additionally, we observed a negative correlation between SRS-2 t-scores and brain activation in the temporoparietal junction and superior temporal gyrus in the right hemisphere during the OBS task, and a similar negative correlation in the left hemisphere during the IM task (**Fig. 1H**). Further, during the IM task, motor cortex activation showed a positive correlation with CAMI scores (**Fig. 1I**). Notably, NAC children displayed a consistent pattern of OBS brain activation as the adult participants. In contrast, ASD children showed different activity in visual, temporal, parietal, and motor cortex (**Fig. 1J**), which may reflect brain activation differences in how visual attention is processed between autistic and non-autistic individuals. Finally, across the groups of children, there were strong relationships between SRS scores and brain activity during OBS, e.g., a negative correlation in the premotor cortex (**Fig. 1K**) - suggesting potential differences in the mirror neuron system during motor observation in individuals with stronger autism traits.

Conclusions: Using simultaneous HD-DOT and CAMI, we investigated brain function during both motor observation and naturalistic motor imitation (not possible in an fMRI) and observed key group differences as well as neural correlates between autism traits and brain function underlying both OBS and IM. Future directions include ongoing studies extending HD-DOT and CAMI to pre-school-age children to investigate early developmental patterns and improve intervention strategies at a critical neurodevelopmental age.

**402.137 Cerebellar Contributions to Social Learning in Typically Developing and Autistic Adolescence**

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Background: Adolescence marks a critical stage in social development, during which individuals experience increasing social demands. While adolescents generally display less optimal social learning strategies compared to adults (Rosenblau et al., 2018), autistic teens face even greater difficulties in navigating these social challenges (Picci et al., 2014). These social challenges have been tied to altered predictive abilities. Autistic adolescents seem to use and encode prediction errors (PEs), the discrepancy between predicted and actual consequence, less compared to nonautistic peers (Rosenblau et al., 2020). A possible neural mechanism for this encoding difference involves cerebellar posterior lobe (CPL), a structure thought to generate predictions and encode PEs (Ramnani, 2006), and its densely connected cortical region, medial prefrontal cortex (mPFC) (Stoodley, 2016). However, this has been insufficiently studied across neurotypes, including in non-autistic adolescents.

Objectives: This study investigates cerebellar contributions to social learning in autistic (AUT) and nonautistic (N-AUT) adolescents. We hypothesize that the cerebellum encodes PEs in adolescents and expect differential cerebellar involvement in PE encoding between N-AUT and AUT.

Methods: Participants inferred a peer's preferences for 60 food and activity items in two runs and received feedback on actual preferences after each trial. PEs are the difference between ratings and feedback, with learning defined as PE reductions over time. fMRI data was preprocessed with fMRIPrep (Esteban et al., 2019), and the cerebellum was processed with SUIT (Diedrichsen, 2006). PEs were used as parametric regressors in a linear mixed effects model in FSL's FEAT to investigate cerebellar activity modulation.

Results: A preliminary sample of N-AUT adolescents (N = 14, 9 - 17 years old, 6 females), who completed the social learning task, showed a trend of PE reductions over time, and PEs were negatively associated with age. As predicted, the region of interest (CPL: Lobule VI, Crus I, Crus II) analysis revealed PEs scaled with activity in CPL. Furthermore, a non-linear relationship between age and PEs activity in CPL aligns with non-linear neural development throughout adolescence. A whole brain analysis with an overlapping N-AUT sample (N = 18, 9 - 17 years old, 5 females) revealed PEs scaled with activity in mPFC (Fig. 1). Further analyses are planned to expand on these initial findings, by analyzing PEs scaled CPL activity and functional connectivity between the CPL and mPFC during social learning with a larger sample of 18 N-AUT and 17 AUT participants.

Conclusions: Our reported findings highlight the role of CPL and mPFC in encoding PEs during social learning in adolescence. Follow up analyses in a larger sample of N-AUT and AUT participants can clarify the role of the cerebellum and of fronto-cerebellar connectivity in social learning of adolescents. Our study can not only shed light on brain development and social learning in adolescence, potentially identify this period as a sensitive period for cerebellum and fronto-cerebellar connectivity for social learning; it can also inform our understanding of predictive framework and cerebellar function in autism pathology and symptomatology.

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402.138 Cerebellar Modulation of Brain Activation during Cognitive Flexibility in Autism: A Tdcs-fMRI Study

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Background: While inflexible behaviors are a core feature of autism, the neural bases of inflexible behaviors are less often investigated than social behaviors. In pre-clinical rodent models, modulating autism-relevant cerebellar subregions leads to inflexible behaviors (Kelly et al. 2020). The Flexible Item Selection Task (FIST), a cognitive flexibility task, robustly engages the cerebellum, with right cerebellar lobule VII showing the most statistically significant activation in the entire brain (Dajani et al. 2020). While autistic individuals have poorer FIST performance on flexibility trials (Yerys et al. 2012, Campbell et al. 2017), the neural bases of these differences are not clear. Further, the impact of cerebellar neuromodulation on cognitive flexibility has not yet been investigated in human participants. In this study, autistic young adults performed the FIST task after transcranial direct current stimulation (tDCS) targeting right cerebellar VII. We measured both task performance and functional MRI activation patterns.

Objectives: We hypothesized that: 1) the cerebellum will show less engagement during Flexibility trials than in neurotypical cohorts; 2) active tDCS will selectively impact performance during Flexibility trials; 3) active tDCS will modulate cerebellar activation during Flexibility trials.

Methods: Ten autistic adults (23±5 years; 6 Male, 4 Female) received 20min of 1.5mA excitatory (anodal), inhibitory (cathodal) or sham tDCS targeted right cerebellar lobule VII during separate neuroimaging sessions. The FIST task was performed at each session following neuromodulation. The effect of tDCS on task performance was modeled using linear mixed models in R Studio. Neuroimaging data were preprocessed and denoised with the CONN toolbox and statistical modeling was performed using SPM12.

Results: Based on the linear mixed models, there was no significant impact of tDCS condition on task performance, though there was a trend for inhibitory tDCS to decrease performance on Flexibility trials, with no impact on Control trials. At baseline, the autistic group showed increased cerebellar engagement in the posterior midline and during Flexibility trials compared to Control trials ($p < 0.001$, FDR cluster $p < 0.05$), in line with prior studies (Dajani et al. 2020), but no statistically significant engagement of right VII. Active tDCS targeting cerebellar RVII increased Flexibility-related activation both in the cerebellum (bilaterally) and throughout the rest of the brain.

Conclusions: This ongoing study indicated that, while there were no statistically significant tDCS effects on task performance, there was a general trend of decreased task performance on Flexibility trials after active cerebellar modulation relative to sham. At baseline (sham), the autistic group showed robust posterior midline cerebellar activation during Flexibility trials relative to the Control trials, but no statistically significant activation in right lobule VII, which is consistent with prior studies revealing structural and functional differences in right VII in autism. Active tDCS resulted in greater cerebellar activation during the Flexibility trials, including bilateral lobule VII. Interestingly, when comparing both tDCS conditions to sham, flex trials were correlated with greater activations in the inferior olive, a main input pathway to the cerebellum that modulates cerebellar activity. These preliminary imaging findings support the hypothesis that the cerebellum supports cognitive flexibility in autistic individuals.

402.139 Cerebellar Social Reinforcement Learning in Autistic and Neurotypical Adolescents

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Background: Prenatal cerebellar damage is one of the highest known risk factors for autism spectrum disorders (ASD). While traditionally thought to be exclusively a motor region, the cerebellum is now known to be involved in a host of cognitive domains, including social cognition. The posterior cerebellum has been shown to be structurally connected to the striatum and is thought to play a role in reinforcement learning. This cerebellum-striatum pathway has been shown to be critical for pro-social behaviors in rodents. While there has been significant attention given to the ventral striatum in examining social reinforcement in adolescents, the posterior cerebellum has not been examined in this work.

Objectives: In the present study, the sensitivity of the cerebellum to social reinforcement learning signals was examined in a sample of autistic and neurotypical adolescents.

Methods: 85 neurotypical and 28 autistic adolescent participants, aged 11-14, engaged in a social learning fMRI task in which they viewed their own responses to a survey about their likes and dislikes, followed by an option to push a button to learn about their peers preferences (or computer for a nonsocial control). The similar peer responded with positive feedback (thumbs up) 75% of the time and negative feedback (thumbs down) 25% of the time. The dissimilar peer was the reverse while the computer condition had a 50% probability of positive or negative feedback. This event-related design task had 24 trials in each of the four runs.

Results: Behavioral, we found that participants thought of the similar peer as more similar to themselves than the dissimilar peer ($b = 35.3$, $CI = [14.04-56.56]$, $p < .001$), indicating that participants were able to learn about the peers. This is despite no differences in reaction times between similar and dissimilar peer conditions in either group. Neuronally, we found that regions of the default mode network, the ventral striatum, and the posterior cerebellum were significantly more active for similar peer vs computer positive feedback. A preliminary reinforcement learning modeling analysis indicates that the posterior cerebellum is unique from the ventral striatum in that it significantly correlates with the absolute value of a reward prediction error parameter. This effect was true only for the neurotypical adolescents, and not the autistic adolescents.

Conclusions: Overall, these results suggest that similar brain regions contribute to social reward processing in neurotypical and autistic adolescents, but in the former group the posterior cerebellum maybe be contributing a valence-general error signal to social reinforcement learning. Despite these neuronal findings, there were no differences in how neurotypical and autistic adolescents behaviorally responded to learning about similar and dissimilar peers.

402.140 Characterisation of the Face Inversion Effect in Visual ERP Components

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Background:

Face processing is fundamental to social information processing and social behaviour. Autistic people may process faces differently to neurotypical controls but the mechanisms responsible are poorly understood. The face inversion effect – that upside-down faces are harder to process than upright faces – may shed mechanistic light on these differences. A diminished inversion effect in autism has been reported on the N170 face sensitive ERP component, but little is known about how face inversion affects earlier (P1) and later (N2, P2) visual ERP components.

Objectives:

To characterise the face inversion effect in autistic and neurotypical individuals across the P1, N170, P2 and N2 components.

Methods:

We analysed EEG data acquired as part of the multi-site LEAP study. Autistic ($N = 246$) and neurotypical ($N = 190$) participants aged 6-30 years viewed pictures of upright and inverted faces (Fig 1a). Following data cleaning, we extracted the mean P1, N170, P2 and N2 amplitude for each participant and for the upright and inverted condition. We took the amplitude difference between the two conditions (upright-inverted) to calculate the inversion effect. We used linear mixed models to investigate the effect of participant group (autistic or neurotypical) and stimulus condition (upright or inverted), and their interaction, on the amplitude of each component. Age and electrode site were included as covariates and a random intercept model with was used to account for multiple observations per participant.

Results:

Viewing faces evoked a characteristic response consisting of P1, N170, P2 and N2 components (Fig 1B). Visually, the morphology of the ERP to upright faces differed across both groups from the ERP to inverted faces after N170 (Fig 1B). There was no main effect of participant group, however a main effect of stimulus condition (larger amplitude for inverted faces; face inversion effect) was present for all components except P2. This effect differed between autistic and neurotypical groups for the N170 (smaller in autistic group compared to neurotypical group) and P2 component (larger in autistic group compared to neurotypical group, Fig 1C, Table 1).

Conclusions:

The inversion effect was present in both groups, but smaller in the autistic group for N170 and larger in the autistic group for P2. This indicates that disruptions to configural processing caused by face inversion are pervasive across the chain of visually evoked potentials. The altered response in autism may indicate greater difficulties with configural processing in that group.



402.141 Neural Connectivity Effects on Competitive and Cooperative Task Outcomes in Children with and without ASD

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Background: Autism spectrum disorder (ASD) core deficits include social cognitive deficits that extend to difficulties in Theory of Mind (ToM). Previous research shows that competitive manipulations enhance ToM understanding in ASD, yet the neural mechanism underlining this improvement is not yet understood. Individuals with ASD have exhibited resting-state hypo-connectivity; it is plausible that neural connectivity during competition, but not during cooperation, may explain enhanced social performance in ASD.

Objectives: To assess connectivity patterns in ASD, their relation to ASD symptom severity, and the effect of hyper-/hypo-connectivity on accuracy during cooperative and competitive peer play.

Methods: 51 children (ASD=27; TD=24) ages 8.18-16.61 years ($M_{ASD}=12.50\pm2.54$; $M_{TD}=11.74\pm3.02$) were paired with same-group and same-gender peers to perform cooperative and competitive interactive day-night inhibitory control tasks. The tasks require joint and individual actions and inhibitions. Individual (competition) and joint success (cooperation) were displayed on monitors to increase condition priming. Accuracy was recorded via E-prime 2.0. ASD symptom severity was assessed with the ADOS social scale. Participants were fitted with EEG sets, focusing on 7 attentive-social hubs, placing electrodes at the bilateral prefrontal cortex (PFC), and mid-frontal cortex (midFC) for the executive attention network, bilateral ventrolateral prefrontal cortex (VLPFC), and bilateral temporoparietal junction (TPJ) for the orienting attention network and ToM functions. Children were screened for IQ (WISC-IV_{HEB}).

Results: ASD participants demonstrated overall frontal-prefrontal hypo-connectivity in cooperation ($p=.034$) and competition ($p=.002$) as compared with TD, with a unique three-way interaction for hyper-connectivity during competition ($p=.017$), such that children with ASD demonstrate elevated connectivity of the midFC to bilateral TPJ and PFC to right TPJ, in individual compared to joint action, whereas TD children demonstrated elevated connectivity of the midFC to left TPJ and PFC to right TPJ in individual compared to joint inhibition (Figure 1). ASD symptom severity was correlated to cooperative joint action connectivity of the left PFC with midFC ($r=-.63$, $p<.001$) and right TPJ ($r=-.39$, $p=.044$) and individual action of the midFC with left ($r=-.40$, $p=.040$) and right PFC ($r=-.44$, $p=.022$), as well as joint inhibition connectivity of the bilateral VLPFC ($r=-.53$, $p=.004$), such that hypo-connectivity was linked to increased ASD symptoms. Similar links were found for competitive joint inhibition connectivity of bilateral VLPFC ($r=-.40$, $p=.041$) and individual inhibition connectivity of left PFC with right VLPFC ($r=-.44$, $p=.020$). Examination of connectivity relations with accuracy demonstrated positive relations of hyper-connectivity on accuracy during cooperation in both populations, yet more broadly in individual responses for the TD group and the joint responses in the ASD group. These effects were complemented by a unique pattern of hypo-connectivity promoting accuracy in competitive individual actions of ASD (Figure 2).

Conclusions: Findings extend the current body of literature, demonstrating frontal-prefrontal hypo-connectivity in ASD during dyadic play. Furthermore, hypo-connectivity patterns in the ASD group during competitive play and their negative correlations with accuracy may explain increased ToM performance previously found under similar manipulations. Hypo-connectivity relations to ASD symptom severity emphasize the importance of neural connectivity deviances in this population, pointing to possible advantages of competitive social play interventions for ASD.



402.142 Inter-Trial Variability Informs Autism Diagnosis in Machine Learning-Based Power Spectral Feature Analysis of EEG

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Background: Biomarkers are essential for autism diagnosis, providing objective indicators that enhance assessment accuracy and facilitate earlier detection and targeted interventions. Electroencephalography (EEG) is a valuable tool for identifying biomarkers due to its non-invasiveness and scalability. Given the complexity and high dimensionality of EEG data, machine learning methods are better suited for developing biomarkers, as they can uncover intricate patterns that traditional analyses might miss, resulting in more accurate and reliable indicators. Recent studies indicate that increased intra-individual trial-to-trial variability in EEG responses may reflect distinctive brain differences associated with autism and serve as a potentially important diagnostic biomarker (Dong et al., 2024; Magnuson et al., 2020).

Objectives: The objective of this study is to identify whether trial-to-trial variability features serve more diagnostic value in machine learning methods than traditional “mean-EEG” features.

Methods: We analyzed multi-trial resting-state EEG scans from youth with ASD ($N=94$, age 12.5 ± 2.9 years) and without ASD ($N=96$, age 12.9 ± 2.8 years). We extracted two types of features from preprocessed EEG scans: (i) the conventional “mean-EEG” features with power spectral density (PSD) values extracted from the averaged EEG and (ii) “across-trial” features with summary statistics of PSD values extracted from each trial separately. The latter approach allows for assessing the relevance of distributional features across multiple trials of a subject. We trained four machine learning models (logistic regression, support vector machine, random forest, and an artificial neural network) for each of the two feature types separately.

Results: For all four models, using across-trial features resulted in higher overall performance ($p<0.05$). The across-trial logistic regression model achieved the highest accuracy (0.678 ± 0.083), AUROC (0.748 ± 0.082), and AUPRC (0.751 ± 0.086) with repeated 5-fold cross-validation.

Furthermore, we analyzed the weights of the across-trial logistic regression model to interpret performance. We observed that the standard deviation showed higher feature importance than the mean across trials, and delta-theta frequency bands exhibited higher feature importance than other bands ($p<0.05$). Power spectral density (PSD) analysis revealed significant differences between ASD and control groups across frontal, temporo-parietal, and occipital regions. Notably, higher frequency features were highly correlated across subjects, explaining why our machine learning model prioritized lower frequency bands (delta-theta) for diagnosis. These key features also showed strong correlations with behavioral scores (SRS-T and BRIEF Inhibit). In a separate analysis of male and female subgroups, while classification accuracy remained similar, we observed a shift in feature importance: higher frequencies were more relevant in males uniformly across all regions, whereas lower frequencies were more prominent in females, particularly in parietal, temporal, and central regions.

Conclusions: Our study emphasizes the diagnostic value of EEG power spectral density (PSD) and the potential of machine learning for autism classification and biomarker discovery. Analyzing feature variability across trials reveals distinctive biomarkers more effectively than traditional ERP averaging. Key features correspond with significant PSD differences and correlate with behavioral phenotypes in both the overall cohort and male/female subgroups, offering deeper insights into the biological aspects of ASD.



402.143 Community Vs. Lab EEG: Feasibility in Diverse Developmental Populations of Color

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Background:

EEG holds significant promise for enhancing our understanding of neural differences associated with autism. However, communities of color have historically been underrepresented in research due to systemic barriers, distrust, and cultural hesitancy in engaging with institutions. This is particularly evident in terms of laboratory-based EEG collection, where logistical and cultural barriers have contributed to the underrepresentation of children of color in EEG research. To help address these challenges, this study aimed to examine the feasibility of community EEG in diverse populations, which may pave the way for future community-based EEG studies in autism.

Objectives:

This study aims to a) determine the consistency of data collected in lab vs. community settings, b) particularly among low-income and families of color.

Methods:

Ten participants (Mean age: 2.52 years; *SD*: 0.74; Range: 0.97 – 3.36) were recruited from an existing research database in the greater LA region. Laboratory based EEG sessions were collected prior to the community EEG. EEG recordings occurred within 30 days of one another (avg days apart=18.2, *SD*=27.03). Participants were diverse: (*M* age: 2.68 years; *SD*: 0.56; Range: 1.65-3.36; 70% male; 40% Hispanic (*N* = 4), 30% Black (*N* = 3), 20% Caucasian (*N* = 2), and 10% Asian (*N* = 1). Lab EEGs were collected with participants sitting on a caregiver's lap in a soundproofed, electrically shielded room. We utilized a 129-channel HydroCel Geodesic Sensor Net as well as a Net Amps 300 amplifier, powered by Net Station 4.4.5 software. Community EEGs were collected in locations chosen by the family (8 in home, 2 in community settings). EEG data were recorded from 32 active gel-based electrodes using a BrainVision LiveAmp amplifier and BrainVision Recorder software.

Results:

EEG data were successfully collected from ten participants in both lab and community settings. On average, the recording length of the EEG was 356 seconds. The data collected was considered viable and consistent. A paired samples t-test revealed no significant difference in the recording duration for community (*M* = 367.89 seconds, *SD* = 34.43) and lab EEGs (*M* = 344.34 seconds, *SD* = 44.50; *t*(9) = 1.25, *p* = .244, See Figure 1A). Noise estimates, including 60Hz signal power and 60Hz SNR, indicated minimal and comparable line noise across conditions (see Figure 1B).

Conclusions:

Our findings demonstrate that community-based EEG is feasible in a diverse developmental sample, highlighting its potential for increasing research accessibility. By expanding research beyond traditional settings, community-based data collection could enhance the representativeness of studies and improve the applicability of findings. Specifically, this approach could help researchers increase engagement among underrepresented communities, and prioritize the perspectives and experiences of families of color to promote equitable participation. These findings have particular relevance in autism research, where community-based EEG could improve the representativeness of samples, ensuring that our research better serves and benefits the full spectrum of individuals with autism, especially those from underrepresented communities.

**402.144 Comparable Visual Responses in Autistic and Non-Autistic Adults: Analysis across fMRI, EEG, and Psychophysics**

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Background: Visual sensory processing in autism is often characterized by heightened sensitivity, which may reflect differences in neural responses to visual stimuli. Prior research has suggested that these sensitivities might be due to heightened neural responses, though the mechanisms underlying such responses remain unclear.

Objectives: To investigate behavioral and neural responses to visual stimuli in autistic and non-autistic adults using a unique approach that integrates three independent measurement techniques — fMRI, EEG (steady-state visual evoked potentials, SSVEPs), and psychophysics. By applying a consistent visual stimulus across all methods and manipulating contrast sensitivity (high vs. low), we aimed to directly compare neural response magnitudes and sensitivity effects across these distinct but complementary methods.

Methods: Autistic (*N*=27) and non-autistic (*N*=31) adults participated in a multi-session experimental procedure involving fMRI, EEG, and psychophysics experiments. Across all methods, individuals were presented with the same stimuli, bilaterally presented circular counterphase 6Hz-flickering checkerboards, in high (100%) and low contrast (2%) conditions. Circular counterphase flickering checkerboards are effective in eliciting visual responses, making them ideal for multi-method investigations. In the fMRI session, BOLD responses were measured while participants fixated to the center of the screen and the bilateral checkerboards were presented, following a block-design that alternated 10 seconds of stimulus with 20 seconds of blank-fixation. Responses were measured in retinotopically-defined regions of early visual cortex including V1, V2, and V3. For the EEG recordings, a 129-channel cap was used to measure SSVEPs to the same flickering stimuli presentation. SSVEP amplitudes were extracted and analyzed for peak amplitudes across a pre-selected set of electrodes. For the psychophysics experiment, participants underwent three versions of a detection task to the same stimuli; a no adapter, low contrast adapter and high contrast adapter condition. Adapter conditions presented the flickering checkerboards before presenting a subsequent lateralized target checkerboard in one of the two (left or right) hemifields. The contrast of the target was adjusted following a stair-case procedure. Behavioral data was extracted and used to estimate individual contrast detection thresholds across the different conditions. All data were aggregated and tested for group differences.

Results: Stimulus contrast had a significant effect across experiments; the high contrast condition had higher fMRI and SSVEP responses than the low contrast condition. For the psychophysics experiment, a high contrast adapter led to higher contrast detection thresholds than the low contrast adapter and the no adapter conditions. No significant group differences were observed in visual responses across methods. Autistic and non-autistic individuals had comparable BOLD responses, SSVEP amplitudes and contrast detection thresholds across all conditions of the flickering stimuli.

Conclusions: This study provides evidence that behavioral and neural responses to visual stimuli in autistic adults are similar to those in non-autistic adults, as measured by BOLD responses, SSVEP amplitudes and contrast detection thresholds. The use of a consistent stimuli across methods strengthens the reliability of these results. These findings challenge the hypothesis of heightened neural activity to visual input in explaining visual sensitivities in autism.

402.145 Cortical Tracking of Speech in Autism Spectrum Disorder: A MEG Study of Speech Processing Under Different Audio-Visual Conditions

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Background:

Social and communication difficulties are pervasive characteristics of autism spectrum disorder (ASD). Autistic individuals often struggle to integrate auditory and visual information. This challenge becomes especially pronounced in noisy auditory scenes, where they frequently report difficulties with speech comprehension. The neuronal underpinnings of these difficulties remain poorly understood.

Objectives:

To further explore speech processing in ASD, this magnetoencephalography (MEG) study assessed the cortical tracking of speech (CTS) in noiseless and noisy conditions in neurotypical and autistic adults with and without access to visual speech (i.e., attended speaker's lip movements). CTS evaluates how the human brain tracks the amplitude fluctuations of speech (the temporal envelope), at syllabic and phrasal frequencies.

Methods:

Twenty-two high-functioning autistic adults and 25 age- and gender-matched neurotypical adults (age range: 18–35 years, mean age: 26) were included. MEG signals were recorded as participants listened to naturalistic stories presented under different visual (with access to lip movements, images, or blindness) and noise (noiseless, cocktail party noise) conditions. Coherence was evaluated between MEG and speech temporal envelope in two frequency bands: syllabic (4–8 Hz) and phrasal (0.5 Hz).

CTS values were derived from the maximum coherence value across 5 symmetric temporo-parietal sensors showing the largest grand-average per hemisphere. An ANOVA assessed the effect of group, visual condition, noise condition and hemisphere on CTS.

Results:

CTS analyses revealed significant coupling between parieto-temporal neural activity and the attended speech in both populations, at both syllabic and phrasal rates.

The ANOVA did not disclose a significant group effect on CTS at either frequency.

A significant interaction was found between noise, hemisphere, and group on phrasal CTS ($p = 0.013$), reflecting distinct hemispheric lateralization patterns for each group. Specifically, autistic adults exhibited higher phrasal CTS in the left hemisphere, while neurotypical adults showed higher phrasal CTS in the right hemisphere, within the multi-talker background. A significant interaction was also found between visual conditions and group for syllabic CTS ($p = 0.04$), explained by increased CTS in the visual speech condition with lips visibility for autistic individuals compared to neurotypicals, regardless of noise presence.

Conclusions:

The brain of autistic adults tracks the attended speech similarly than those of neurotypical adults but differences emerge based on complex, context-dependent factors. First, left-lateralization of phrasal CTS observed in autistic adults in a multi-talker background may relate to an effect of selective attention on the low-frequency CTS of the attended speech stream to compensate for the sensory or cognitive challenges associated with speech in noise processing. Second, autistic adults show a more efficient tracking of syllable rhythmicity when visual cues are available, compared to neurotypicals. Lip movements and facial expressions may thus provide dynamic temporal and linguistic cues that support the syllabic tracking of the attended speech stream to a greater extent than in neurotypicals. This more efficient audio-visual integration may have developed throughout their lifespan as an adaptive mechanism supporting speech processing.

This study emphasizes the need to consider multiple interacting, rather than isolated, factors to fully understand the neural underpinning of speech processing in ASD.

402.146 Basic Sensory Risk Markers of Schizophrenia in Autism Spectrum Disorder: A Systematic Review and Meta-Analysis

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Background: Schizophrenia (SZ) and autism spectrum disorders (ASD) share multiple features, including impairments in basic sensory processes. These deficits have also been found in groups at-risk of developing SZ. It is well-known that a diagnosis of ASD predisposes an individual to a higher risk of developing SZ, yet it remains unclear whether neurophysiological risk markers for SZ are also commonly observed in ASD. If present, this could point to common neurological mechanisms underlying transdiagnostic development of psychopathology.

Objectives: Perform a systematic review and subsequent meta-analyses for common neurophysiological risk markers for schizophrenia in ASD.

Methods: A literature search was conducted up to June 2024 for studies on prepulse inhibition of the startle reflex (PPI), P50 suppression, mismatch negativity (MMN), N100 and P200 amplitude, and smooth pursuit eye movement (SPEM). PRISMA guidelines were followed, and meta-analyses were performed for datasets comprising five or more studies using similar methodologies.

Results: In total 48 studies met predefined inclusion criteria, and meta-analyses were conducted for three paradigms: PPI, P50 suppression, and MMN. A statistically significant reduction was observed for P50 amplitude to the first stimulus of paired-click paradigms and duration MMN, while no significant differences were found for PPI parameters. For N100, P200 and SPEM paradigms insufficient comparable studies were available for meta-analysis. Overall, results for all measures displayed a high degree of heterogeneity.

Conclusions: These results indicate that some, but not all, basic risk markers for SZ may be present in ASD. However, the observed heterogeneity strongly suggests the presence of neurophysiological subgroups within the ASD spectrum. This highlights the need for targeted research on such subgroups to determine their clinical relevance, such as determining whether individuals with a higher number of disrupted neurophysiological measures are at greater risk for developing schizophrenia spectrum disorders.

402.147 Developmental Differences in Working Memory and Underlying Frontoparietal Activation in Autism Spectrum Disorder and Typical Development: An fNIRS Study

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Background: Individuals diagnosed with autism spectrum disorder (ASD) often encounter difficulties in executive function skills, including working memory (WM), compared to their typically developing (TD) peers. Age is generally associated with WM improvement, especially during childhood and adolescence. However, few studies have compared the age-related difference in WM between autistic and TD individuals.

Additionally, details about the exact neural mechanisms underlying this phenomenon are currently lacking, preventing the development of effective neurological rehabilitation as a means to improve WM development in ASD.

Objectives: The objective of the study was to investigate the age-related difference in WM between autistic and TD children and teenagers.

Besides, the study aimed to reveal the brain mechanisms underlying this possible difference using functional near-infrared spectroscopy (fNIRS).

Methods: Twenty autistic and 20 TD children and teenagers aged 8 to 17, matched in age, gender, and IQ ($ps > .40$), were recruited. Participants were instructed to perform a spatial n -back task with three difficulty levels (0-back, 1-back, 2-back) while their brain activities were recorded by a NIRx NIRScout 16x16 device. A mixed ANCOVA was conducted to examine the effects of group (TD vs ASD) and age, which were between-subjects factors, and difficulty level (0-back vs 1-back vs 2-back), which was a within-subjects factor, on participants' accuracy and mean reaction time (RT). Additionally, the frontoparietal brain network was divided into four regions of interest (ROIs), namely the left frontal, right frontal, left parietal, and right parietal regions. A similar mixed ANCOVA was used to analyze brain activation patterns in both groups.

Results: No significant difference in accuracy or mean RT was observed between the TD and ASD groups, $ps > .25$. Besides, older participants responded significantly more accurately, particularly at 2-back (Figure 1), and were faster than younger ones, $F_s > 15.9$, $ps < .001$. Although the group-by-age interaction was of moderate size for mean RT, $\eta_p^2 = .08$, no age effect significantly differed between groups, $ps > .10$. Similarly, the TD and ASD groups showed comparable brain activation, $ps > .53$, except in the left parietal area, where the TD group exhibited higher activation than the ASD group, $F(1, 35) = 5.04$, $p = .03$. Moreover, a significant age difference in activation was found for the bilateral frontal and right parietal regions (Figure 2), where younger participants displayed higher brain activation than older ones, $F_s > 4.12$, $ps < .05$. Although the group-by-age interaction was of moderate size for the right frontal region, $p = .16$, $\eta_p^2 = .06$, the age effect significantly differed between groups for none of the ROIs, $ps > .16$.

Conclusions: There is insufficient evidence to suggest that children and teenagers with and without ASD demonstrate developmental differences in WM capacity and brain activation yet. More evidence will inform whether the age effects on task performance and right frontal activation during WM performance are different in ASD. Although older children outperform younger ones, they recruit less brain activities, implying an age-related decrease in effort for both autistic and TD individuals to perform the task.



402.148 Directional Anisotropy in the Neural Representation of Human Movement Kinematics and Its Relationship to Autistic Features in Children: Results from the Autism Biomarkers Consortium for Clinical Trials (ABC-CT)

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Background:

Atypical biological motion (BM) perception has been hypothesized to be a core feature of ASD. A critical source of information carried in BM patterns involves asymmetric acceleration along the vertical plane, and predictively modeling the influence of gravity is critical for organizing spatial and temporal predictions about visual motion trajectories, including BM information. Despite the variety of methods and tasks used to study BM processing in ASD, no study has investigated whether sensitivity to implicit force-related information can offer a mechanistic explanation for BM processing differences in ASD.

Objectives:

The current study uses neural decoders trained on EEG collected during a BM task to examine how human movement is represented in neural activity in autistic and age-matched non-autistic individuals. We test for differences in the neural representation of motion dynamics according to directional axis (horizontal vs vertical) to assess the hypothesis that perceptual sensitivity to vertical motion during BM processing is relevant to neurocognitive profile of ASD.

Methods:

EEG was recorded as 166 autistic (36 females; μ age= 8.62) and 76 non-autistic (20 females; μ age= 8.43) participants passively watched videos of point-light walkers that either preserved the human form or were spatially and temporally scrambled (factor: motion type). Within each participant and motion type condition, a rotating leave-one-out training procedure generated decoders that transformed EEG data into predicted motion representations, which were then compared against the veridical stimulus to yield a metric (Pearson correlation) for decoding performance. This procedure was run twice using varied stimulus representations that isolated vertical or horizontal motion dynamics. Regression analyses tested for interactions between motion type, motion axis, and diagnostic group on decoder performance and the relative degree of predictive neural activity relevant for visual tracking. The latter was achieved by modeling the difference in decoder weights summed across -200ms to 0ms and across 0ms to 200ms (pre- minus post-video frame onset). Participant-level random slopes of motion type were also used to investigate relationships with symptom features.

Results:

While no effects of diagnostic group emerged on decoder scores, the analysis of decoder weights revealed a main effect of diagnosis ($b=-138.0$; $SE = 54.65$; $p=0.01$), and interactions between diagnosis and motion type ($b=186.25$; $SE = 22.25$; $p<0.0001$), and diagnosis and motion axis ($b=-70.0$; $SE = 22.31$ $p<0.01$). Participant-level effects of motion type on the temporal organization of decoder weights were positively associated with autism features (Social Responsiveness Scale total raw score ($p=0.004$), only in models trained on vertical motion trajectories).

Conclusions:

Although the degree to which neural activity tracked visual motion dynamics (decoder performance) was comparable across autistic and non-autistic individuals, robust group differences were apparent in the composition of decoders—specifically, how much utility was assigned to predictive versus postdictive neural activity. Across non-autistic participants, the contribution of predictive neural activity for motion tracking was enhanced for biological relative to scrambled motion. This effect was disrupted in the ASD cohort, and the magnitude of this effect during vertical movement tracking was associated with clinical features at the individual level.

402.149 Dissecting the Corticostriatal Functional Circuits to Parse out the Heterogeneity of Autism and ADHD Symptoms

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Background: Autism spectrum condition (ASC) and attention-deficit/hyperactivity disorder (ADHD) are two prevailing developmental conditions that are frequently co-occurring. Their commonalities can be found across many behavioral symptoms but are particularly highlighted for 'executive dysfunction'. Previous studies often referred to an altered corticostriatal circuit, a key brain network modulating flexibility, motor persistence, and attention as a common biological substrate for this dysfunction. Despite such importance, the details of circuit-level mechanisms underlying how this circuit dysfunction could lead to both common and distinct behaviors/cognitive symptoms in ASC and ADHD, and how they generate substantial phenotypic heterogeneity in each condition remain largely unknown.

Objectives: Here we tackled these questions by leveraging dimensional approaches to describe their clinical symptoms, executive functions, and corticostriatal functional connectivity (FC) along an integrated common axis to explain the comorbidity and heterogeneity of ASC and ADHD.

Methods: We analyzed the Healthy Brain Network data of clinically diagnosed ASC, ADHD, and neurotypical (NT) individuals (all male; 35 NT, 23 ASC, 111 ADHD, and 61 ASC+ADHD), targeting behavioral symptoms, cognitive performance (assessed by NIH toolbox) and neuroimaging data. Specifically, we have conducted: i) a factor analysis to identify the latent components commonly underlying behavioral symptoms of ASC and ADHD and ii) a partial least squares (PLS) analysis to investigate a multivariate relationship between these symptoms and corticostriatal FCs.

Results: The factor analysis identified four major symptom components across individuals with ASC and ADHD: 'social problems (Factor1)', 'impulsive behavior (Factor2)', 'emotional problems (Factor3)', and 'repetitive behavior (Factor4)' (Fig. 1A). Group comparisons based on diagnostic labels revealed that Factors 1, 3 and 4 were primarily associated with ASC-traits, while Factor2 with an ADHD trait (Fig. 1B). Notably, as expected, the ASC-trait Factors 3 and 4 revealed a negative correlation with a performance of cognitive flexibility, inhibition control, and working memory, whereas the ADHD-trait Factor2 did not show any similar effect with executive function scores (Fig. 1C). Next, associating these factors with corticostriatal FCs based on PLS, we further revealed a significant brain-symptom relationship in Factors 1 and 2 (Fig. 2A, B). Posthoc FC loading analyses localized this significance within the corticostriatal circuit, suggesting that the putamen and sensory-motor cortices may be common pathological substrates to describe various transdiagnostic symptoms between ASC and ADHD.

Conclusions: Our findings suggest that the corticostriatal alterations may be a core transdiagnostic feature, which variation could parsimoniously explain the heterogeneous behavioral symptoms commonly observed in ASC and ADHD. Our approach provides a promising Research Domain Criteria framework to discover a potential biological axis that may underlie the manifestation of ASC and ADHD, the two major developmental conditions.



402.150 Do Cognitive and Motor Skills Predict EEG Data Quality in 6 Month Olds at Higher Likelihood of an Autism Diagnosis?

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Background: Autism spectrum disorder (ASD) is characterized by core social communication and behavioral deficits that emerge after the first year of life. The Infant Brain Imaging Study (IBIS) was established to examine structural and functional brain differences in infants at a higher likelihood of developing ASD (HL; denoted by the presence of an older diagnosed sibling). We recently published a manuscript detailing the addition of electroencephalography (EEG) to this MRI and behavioral based study (Dickinson et al., 2024). Protocol feasibility metrics demonstrated that 72.5% of all infants successfully completed the entire protocol at 6 and 12 months. Data quality remained high with 77.6% and 81.5% of resting state data retained after artifact removal across 6 and 12-month infants, respectively. Nevertheless, behavioral characteristics of each infant were not yet evaluated in relation to EEG data quality.

Objectives: After establishing and testing a standardized protocol to acquire EEG data from HL infants, we asked whether developmental abilities, assessed by the Bayley Scales of Infant and Toddler Development (Bayley-4) at age 6-months, predicted EEG data quality in these infants. The cognitive and motor domains of the Bayley were assessed in relation to clean resting state EEG data to investigate the efficacy of EEG use across developmental abilities.

Methods: Developmental domains were measured through the Bayley-4 in 60 6-month-old infants at HL for ASD. Percentile rank on the cognitive and motor domains were extracted. Correlations between the percentage of clean EEG time and both the cognitive and motor domains were conducted. A multivariate regression was performed to investigate whether cognitive and motor Bayley subscale scores predicted total seconds of clean EEG time and total number of clean EEG channels after artifact removal.

Results: The Pearson correlation coefficients for neither the Bayley-4 cognitive nor motor subscores were significantly correlated to EEG data quality in this 6-month-old cohort. Additionally, multivariate regression showed that neither cognitive or motor scores were a statistically significant predictors of clean EEG data, measured in time and channel count (Tables 1 & 2).

Conclusions: Analyses revealed that neither cognitive nor motor scores, as measured by the Bayley Scales of Infant and Toddler Development at 6-months of age predicted EEG data quality. These findings suggest that data quality may remain independent of developmental level and support the continued use of EEG as a measure to examine infants that may have developmental delays. While a significant effect was not found here, computing the Bayes Factor may help to determine based on our sample size what association is relevant to this population. It is also possible that specific features of the EEG signal, such as spectral power or event related potentials will hold predictive value for infant development. In addition to confirming the above results at 12-month timepoints, we plan to investigate how specific spectral characteristics map onto cognitive and motor scores for these infants, as well as those with greater developmental delay.



402.151 Effects of a Social Skills Intervention on Restrictive and Repetitive Behaviors and Interests in Autistic Adolescents

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Background: To our knowledge, group-based social skills interventions (GSSIs) have not been extensively studied for their impact on restrictive and repetitive behaviors and interests (RRBIs), central features of autism. Limited behavioral research using the Program for the Education and Enrichment of Relational Skills (PEERS), a GSSI, on autistic adolescents revealed overall reductions in RRBIs and increased social competence scores post-intervention (Hong et al., 2019). Prior research on the neural basis of autistic symptomatology suggests overconnectivity in cortico-basal ganglia circuits (BG) is linked to higher RRBIs (Traynor et al., 2018). However, few imaging studies have examined the effects of GSSIs on BG circuitry and subsequently RRBIs.

Objectives: To examine whole-brain functional connectivity of the BG and its relationship to RRBIs in autistic adolescents, compared to typically developing (TD) controls after a social skills intervention.

Methods: Parents of autistic adolescents completed the Social Responsiveness Scale, Second Edition, Restrictive and Repetitive Behavior subscale (SRS-2 RRB; Constantino & Gruber, 2012), before and after the standardized 14-week PEERS (Laugeson et al., 2015) intervention. Resting-state functional MRI data obtained via a Siemens 3T PRISMA for 15 autistic adolescents ($M_{age} = 14$, 73.3% male) and 11 TD controls ($M_{age} = 15$, 58.3% male) pre- and post-PEERS intervention. FSL (Smith et al., 2004) and AFNI (Cox, 1996) were used for data preprocessing and bandpass filtering ($0.008 < f < .08$ Hz). ICA-AROMA (Pruim et al., 2015) removed potential motion confounds. A bilateral BG mask was created using the Harvard-Oxford atlas (Desikan et al., 2006). Global time series extracted from this mask were correlated with whole-brain signal. Fisher r-to-z transformations normalized final connectivity maps. AFNI's 3dClustSim (Cox et al., 2017a, 2017b) was used to estimate the probability of false positives while running paired t-tests group-level comparisons. Z' (prime) scores from clusters of significance for groups were extracted to calculate change scores from pre- and post-intervention connectivity clusters. Change scores were created for autistic adolescents from pre- and post-intervention SRS-2 RRB scores. Pearson's correlations were run to examine relationships between BG connectivity change scores and SRS-2 RRB change scores.

Results: There was a significant difference between SRS-2 RRBs scores pre ($M = 77.20$, $SD = 8.55$), and post- ($M = 69.66$, $SD = 8.56$) the PEERS intervention in autistic adolescents, $t(14) = 2.80$, $p = .007$. Pre-intervention, between-group whole-brain comparisons revealed no significant differences with BG connectivity across groups, $p > .05$. Between-group comparisons revealed whole-brain underconnectivity of the BG with the left lingual gyrus (LLG) in autistic participants compared to TD controls post-intervention, $p = .01$. Autistic adolescent BG underconnectivity was negatively correlated with SRS-2 RRB subscale change scores, $r = -.48$, $p = .037$, indicating greater BG underconnectivity with the LLG was associated with reduced RRBIs post-intervention.

Conclusions: Consistent with previous research, participation in a social skills intervention was associated with lower RRBIs in autistic individuals. Findings suggest underconnectivity of the BG with a primary sensory (visual) processing area post-intervention may reflect compensatory mechanisms in enhancing sensory processing, thus suggesting broader implications for treatment.



402.152 Electroencephalographic Correlates of Sleep Onset in Preschool Autism

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Background:

The earliest stage of non-rapid eye movement sleep cycle (N1) is the lightest sleep marked by the transition from wakefulness, known as drowsiness or sleep onset. Electroencephalography (EEG) during N1 is characterized by gradual reduction of posterior dominant alpha [8-13Hz] activity with diffused theta [4-8Hz] waves. It is fairly common for autistic individuals to experience parasomnia and sleep disturbances which have been adequately captured by sleep questionnaires [1]. The neural markers of such behaviors are much to be explored, particularly during sleep onset.

Objectives:

Given the prevalence of sleep problems in ASD, we hypothesized that they exhibit higher ATR particularly around posterior region with atypical peak alpha frequency (PAF). We aimed to compute EEG correlates of sleep behaviors captured during N1 and establish a relationship with ASD symptoms. Our target population is preschool children with autism and age-matched non-autistic children with other developmental disorders as a control group.

Methods:

EEG was recorded from 25 preschool children (2-6 years) during daytime sleep, out of which 15 were diagnosed with ASD and 10 were diagnosed with other neurodevelopmental disorders except ASD. The annotations of clean N1 segments were performed manually by medical professionals. All segments underwent 0.5-70Hz bandpass followed by a 50Hz notch filter. Power spectral density was computed from Welch's method and subsequently theta and alpha powers were estimated through Simpson's integral within each's frequency bounds. ATR and PAF were computed for each non-overlapping N1 epoch of 8s and averaged across all epochs. Children's Sleep Habit Questionnaire (CSHQ) was administered to all children to quantify their sleep pattern and behavior. The Indian Scale for Assessment of Autism (ISAA) was used to assess the severity of autism. All children in the ASD group exhibited mild or moderate autism. Statistical analysis involved topographically charting significant group differences for each measure and correlating them with ISAA and CSHQ domains. Generalized linear models were used to predict autism severity and sleep onset in autism from bilaterally derived EEG over anterior, central and posterior regions.

Results:

ASD displayed significantly higher ATR in central, occipital and in the right parieto-occipital regions. PAF in ASD was significantly lower around the right central region. Emotional responsiveness (ER) in ASD showed positive correlation ($r>0.8$) with high ATR and negative correlation ($r<-0.8$) with PAF. Sleep-disordered breathing (SDB) also correlated positively with ATR and ER in ASD. Correlating CSHQ and ISAA, bed-time resistance came out strongly associated ($r>0.9$) with sleep anxiety. Significant negative association was found between occipital PAF with ER in ASD ($p<0.01$, $\text{adj-}r^2=0.63$, $\beta=-1.52$).

Conclusions:

Through this study, we have validated our hypothesis of reduced sleep quality in autistic preschoolers through the markers of EEG during sleep onset. These objective measures correlate very strongly with autism symptomatology and sleep behaviors. Sleep disorders directly impact the quality of life of both autistic individuals and their family/caregivers. Early detection of sleep anomalies could be an effective tool to guide intervention and sleep therapy, and in turn lead to mitigate ASD symptoms.



402.153 Electrophysiological Responses to Auditory Stimulus Salience in Autistic Children Correspond with Behavioral Observations of Sensory Responsiveness

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Background: Differences in responses to sensory stimuli, including hyper- and hyporesponsivity to sounds, are highly prevalent in autistic children and can have negative impacts on development and quality of life. While several behavioral measures have quantified differences in sensory responsiveness and links with outcomes in autism, there is a need for improved understanding of underlying neural mechanisms of atypical sensory processing. Measuring neural responses to stimulus salience via electroencephalography (EEG) can provide non-invasive, objective indices of alterations in neural circuits driving both hyper- and hyporesponsivity to sounds at varying volumes that may serve as potential biomarkers.

Objectives: This study characterizes neural markers of altered auditory processing by determining a) whether autistic children show different event-related potential (ERP) responses to varying auditory stimulus salience, or volume levels, compared to typically developing (TD) children and b) whether individual changes in response magnitude over volume correspond to behaviorally observed sensory processing.

Methods: Data collection is ongoing, with 19 3-4 year old participants (12 TD, 7 Autism) who have completed study protocol. EEG data are collected while participants are presented with 150 trials of 500 ms tones at four volume levels: 50 dB, 60 dB, 70 dB, and 80 dB in random order. Data are collected using NetStation and a 128-channel Geodesic sensor net (Net Amps 400 amplifier, Hydrocel GSN 128 EEG cap, EGI systems Inc). EEG data are preprocessed using the Batch EEG Automated Preprocessing Platform (BEAPP) and Harvard Automated Preprocessing Pipeline (HAPPE), with data bandpass filtered from 0.1-30 Hz and rereferenced to average. The amplitudes of the P1 (defined a priori as occurring between 95 and 145 ms poststimulus) and N2 (defined a priori as occurring between 215 and 265 ms poststimulus) components measured at frontal electrodes (averaged responses at Fz, F4, and F3) were derived for analyses. Participants also completed the Sensory Assessment for Neurodevelopmental Disorders (SAND), a behavioral assessment of sensory responsiveness, and the Mullen Scales of Early Learning.

Results: Preliminary results show significant P1 and N2 amplitude enhancements for the loudest volume compared to the softest volumes, and a Volume x Group interaction effect for N2 amplitudes, $F = 3.12$, $p = .032$, $\eta^2 = .12$, such that there are significant volume effects for the TD group that are absent in the Autism group (Figure 1). Additionally, the Autism group shows a significantly reduced slope of N2 amplitudes over increasing volume compared to the TD group, $t = -3.22$, $p = .005$, $d = -2.61$. There is considerable individual variability in the slopes of P1 and N2 amplitudes, and associations between N2 slope and SAND scores are moderated by group and developmental level (Figure 2).

Conclusions: Our findings suggest that neural responses to auditory stimuli show dynamic change in response to increasing salience, autistic individuals show less dynamic change, and individual differences in dynamic change correspond to behaviorally observed sensory responsiveness. These findings can help further characterize neural mechanisms underlying altered sensory responsiveness in autism that may inform the development of more targeted diagnostic tools and interventions.



402.154 Elevated Information Conflict Processing during Visual Perspective Taking in Autism: Evidence from EEG

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Background: Visual perspective taking (VPT) describes the ability to understand what a scene would look like from another person's vantage point. The necessity to ignore irrelevant information, such as information that is incongruently available to the self and another person, can increase the difficulty to judge visual perspectives. Previous studies indicated altered VPT performance in autism, especially with higher task difficulty. In non-autistic participants, the modulation of event-related potentials (ERPs) during VPT has been suggested to reflect attentional processes (P200), self-other distinctions (P3) and conflict processing during response selection (late frontal slow wave [LFSW]). ERPs are hence promising to reveal neurophysiological processes that may underly atypical VPT in autism.

Objectives: The aims were to 1) investigate whether autistic individuals show altered behavioral VPT, 2) examine altered ERPs and, by extension, associated underlying functions of VPT in autism and 3) investigate altered effects of information incongruency on behavior and neurophysiological processing.

Methods: We assessed behavioral responses and EEG of 84 participants (autistic: $n=46$, non-autistic: $n=38$) between 10 and 17 years during an established VPT paradigm (Samson et al., 2010). Participants were presented with a picture of an avatar facing one of two opposing walls, on which 1-3 disks were visible. Participants were instructed to judge whether a cue at trial start indicated the correct number of disks that could be seen from either their own or the avatar's perspective. The number of disks that was visible from the participants' perspective was either congruent or incongruent to the number of disks visible to the avatar. Interaction effects between group (autistic/non-autistic), perspective (self/avatar) and congruency (congruent/incongruent) on behavioral performance (reaction times [RT], accuracy) and mean amplitude of ERPs (P200, P3, LFSW) were analyzed with (generalized) linear mixed effect models on a trial-by-trial level.

Results: Autistic compared to non-autistic participants were less likely to respond correctly when rating the avatar's perspective in congruent trials ($p=.005$) and generally slower when responding to incongruent trials ($p=.039$). Only autistic participants were less likely to respond correctly and showed a smaller LFSW to incongruent compared to congruent trials when rating their own perspective ($p<.001$), while in both groups incongruent trials were associated with lower accuracy and smaller LFSW when rating the avatar's perspective (autistic: $p=.002$, non-autistic: $p<.001$). The P200 and P3 mean amplitude were larger for congruent compared to incongruent trials ($p<.001$, respectively) but did not differ between groups.

Conclusions: Results suggest altered VPT abilities in autistic youth. Elevated congruency effects in autistic individuals' rating of their own perspective may reflect an attenuated ability to disregard irrelevant information. Neurophysiological results did not support attentional or inherently social functions to underly attenuated VPT performance. Instead, differences in LFSW amplitudes indicated an altered cortical recruitment to resolve conflicting information during response selection in autism.

402.155 Evaluating Machine Learning Techniques for Autism Identification through Resting State EEG

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Background: Electroencephalography (EEG) has become a dominant method for identifying neural markers associated with autism spectrum disorder (ASD). Researchers have applied various computational modeling and machine learning approaches to improve our understanding of ASD. Most of the machine learning studies focused on children's EEG data with adult EEG data being less frequently assessed.

Objectives: The primary objective of this study was to test and compare different machine learning models for classifying ASD based on adult EEG signals. We aimed to optimize our approach by utilizing various EEG features that may contribute to the development of assistive tools for diagnosis and monitoring intervention effects in clinical settings.

Methods: We used a publicly available dataset from University of Sheffield, which contains resting state EEG data from 28 individuals with ASD and 28 neurotypical controls (age range: 18-68). After preprocessing for artifact removal, we extracted features in the time-domain, frequency-domain, and entropy-based measures. We trained and evaluated several machine learning algorithms, including Support Vector Machines (SVM), Random Forests, and K-Nearest Neighbors (KNN), employing an ensemble approach for participant classification. Cross-validation techniques were applied to verify the robustness of the models.

Results: Despite the wide age range in the participants, our base models achieved promising classification accuracy with specific EEG features. Feature selection and ensemble methods further improved model performance with an impressive accuracy of 98.85%, suggesting that certain EEG biomarkers could serve as reliable indicators for ASD classification. We further tested the models' resilience by introducing artificial noise to the data, which did not significantly affect accuracy, demonstrating their robustness against new and noisy inputs.

Conclusions: Our findings showcase the potential of data-driven computational modelling of ASD. Future research will focus on refining classification models by considering age-related differences and validating them with larger datasets to enhance generalizability.

402.156 Lactate and the Locus Coeruleus in Autism: Insights from Magnetic Resonance Spectroscopy and Pupillometry

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Background: Lactate release by astrocytes fuels neuronal activity and functions as a signaling molecule critical for synaptic plasticity and memory. Prior research using magnetic resonance spectroscopy (MRS) has demonstrated that increased concentrations of cerebral lactate are present in autism. One driver of lactate production and mobilization from glucose and glycogen stores is norepinephrine (NE), which is released during firing of the locus coeruleus (LC). The LC-NE system, which also plays a critical role in arousal regulation and selective attention, has been shown to function differently in autistic individuals. Although prior research has shown elevated cortical lactate levels in autism, it remains unclear whether increased tonic LC-NE activity in autism contributes to these lactate differences.

Objectives: To examine cortical lactate levels in autistic and neurotypical children, and to determine whether persistently elevated LC-NE activity in autism, as indexed by resting pupil diameter, is associated with group differences in cortical lactate levels.

Methods: Participants included 20 autistic children and 20 age-, sex-, and nonverbal-IQ matched neurotypical (NT) children. 1H-MR spectroscopy data were obtained on a 3T Siemens Prisma MR Scanner using semi-LASER localization (TE = 35 ms, TR = 2000 ms, Averages = 64, Acquisition Time = 2:28) to measure lactate in the visual cortex (VIS; 30mm x 30mm x 20mm), temporal-parietal junction (TPJ; 30mm x 30mm x 20mm), and frontal eye fields (FEF; 30mm x 30mm x 20mm). Spectra were quantified using LCModel. Pupil diameter was monitored using an EyeLink 1000 Plus remote eye-tracking system. Children completed a baseline eye-tracking task to measure resting pupil diameter, which has been shown to indirectly index tonic LC-NE activity.

Results: For lactate measures, autistic children did not differ from NT children for FEF (autism=0.31 [0.07]; NT=0.28 [0.04]; $p=0.13$) or TPJ (autism=0.26 [0.06]; NT=0.24 [0.05]; $p=0.32$) lactate levels; however, autistic children did evidence significantly increased lactate levels in VIS (autism=0.35 [0.07]; NT=0.29 [0.06]; $p=0.004$) and average lactate levels across all three VOI (autism=0.31 [0.05]; NT=0.27 [0.03]; $p=0.003$). For the baseline eye-tracking paradigm, autistic children showed significantly increased pupil diameter compared to their NT peers (autism=4.24 [0.63]; NT=3.62 [0.55]; $p=0.002$). For both groups combined, the relationship between resting pupil diameter (i.e., tonic LC-NE activation) and average cortical lactate levels was significant ($r = 0.58, p < 0.0001$). This association was present in the autism group ($r = 0.55, p = 0.01$), but not the NT group ($r = 0.35, p = 0.13$).

Conclusions: Consistent with prior reports, our results show that autistic children exhibit both greater levels of cortical lactate and elevated tonic activation of the LC-NE system. Rather than arising due to metabolic dysfunction, our findings suggest that greater concentrations of cerebral lactate may be the consequence of persistently heightened LC-NE activity in autism. These findings provide further support for autistic differences in LC-NE activation and their association with cerebral lactate levels. Given the important role of lactate as a neuronal energy source and signaling molecule, future research should explore the neurofunctional and behavioral consequences of increased cerebral lactate in autism.

402.157 Evidence Towards a Sensorimotor Basis for Facial Expression Differences in Autism

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Background: Nonverbal social communication depends on both spontaneous facial expressions which accurately represent one's internal sensations and emotions, and voluntary control of these expressions to adapt to social circumstances. Differences in facial expressivity are commonly observed in autism, even when the self-reported emotion is similar to non-autistic peers. Given that sensorimotor differences are common in autism, and that facial expression is a complex motor behavior, it is possible that facial expression differences in autism have a sensorimotor basis. Understanding this putative low-level source of altered facial expressivity would both inform evidence-based social skills interventions and address stigma based on non-autistic assumptions about autistic facial expressions.

Objectives: The goal of this study was to interrogate a sensorimotor basis for facial expressivity differences in autism by assessing group differences in functional connectivity among the somatotopic face areas of the primary sensory and motor cortices.

Methods: We performed a seed-based connectivity analysis on resting state functional magnetic resonance images from n=59 autistic (AUT, mean age=16.89, 28% female) and n=71 non-autistic (NA, mean age = 18.69, 25% female) individuals to interrogate pairwise connectivity between the upper and lower somatotopic face areas of the primary sensory (S1) and primary motor (M1) cortices. To test the hypothesis that somatotopic organization of functional connectivity across the facial sensory and motor cortices differs in autism compared to non-autistic peers, we fit a linear mixed effects model on the Fisher-transformed correlation (z-value) representing the correlation in BOLD signal for each ROI pair, including diagnostic group, ROI pair identity, diagnostic group * ROI pair identity, gender, and age as fixed effects. Individual subject identity was included as a random effect. We then replicated these analyses using data from n=106 non-autistic and n=106 autistic adults from the Autism Brain Imaging Data Exchange (ABIDE).

Results: In both the AUT and NA groups, we observed that: (1) The upper face areas of S1 have equivalent functional connectivity (FC) with the upper and lower face areas of M1, and (2) The lower face areas of S1 have greater FC with the lower face areas of M1, compared to the upper face areas of M1 (contrast estimate= 4.29, SE=0.39, t-ratio=10.86, p-value<2e-16). These findings were replicated in the ABIDE dataset (contrast estimate=4.29, SE=0.40, t-ratio=10.72 p-value<2e-16).

Conclusions: These data suggest that FC between the primary sensory and motor cortex is organized with somatotopic specificity for the lower face, but not for the upper face, and that this organization does not differ in autistic compared to non-autistic individuals. Somatotopic specificity in lower face S1-to-M1 FC may reflect the fine sensorimotor control required for complex lower face actions such as vocalization and mastication. A broad network of cortical and subcortical regions support the balance between spontaneous and voluntary facial expression control. Thus, the next steps for this work will involve mapping and comparing the structure of this broader network across autistic and non-autistic individuals. Future work should also consider how camouflaging impacts the balance between neural systems for voluntary versus involuntary facial expression.



402.158 Evoked and Induced Gamma Power in VEPs from Children with ASD-Related Synaptopathies

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Background: Autism Spectrum Disorder (ASD) can alter neural circuit dynamics at multiple levels, including "lower-level" processing of basic sensory stimuli and "higher-level" complex cognition. Prior literature associates disorders of mTOR, a neurologic signaling pathway, with increased likelihood of ASD diagnosis. Visually Evoked Potentials (VEP) on electroencephalography (EEG) can enhance understanding of the neural dynamics of mTOR and its relationship to cognitive processing may be valuable in identifying biomarkers for ASD. Within the VEP, comparisons between phase locked (evoked) gamma responses, which correspond to a stimulus-driven, lower-level neural reaction, and non-phase locked (induced) gamma responses, which represent nuanced, higher-level processing, illustrate these differences. Although previous research suggests children with ASD have significant differences in evoked and induced VEP gamma responses compared to their TD counterparts, this has not been previously studied among populations with mTOR pathway disorders. By focusing on neurogenetic disorders of the mTOR pathway, this project aims to identify additional biologically-based insights into the neural dynamics influencing ASD.

Objectives: We compared both evoked and induced VEP gamma responses (30-59Hz) between children with Phelan-McDermid Syndrome (PMS), PTEN Hamartoma Tumor Syndrome (PHTS), and Tuberous Sclerosis Complex (TSC), and age-matched TD peers.

Methods: We collected VEP EEG data from children (2-11 years) with PMS (n=31), PHTS (n=14), and TSC (n=21), and a TD group (n=28) as part of a multisite study. Data were preprocessed using the Batch EEG Automated Processing Platform (BEAPP) and Harvard Automated Preprocessing Pipeline (HAPPE). Evoked and induced gamma power were calculated using a wavelet-based time-frequency analysis methodology from established literature (Figure 1). The time-frequency decomposition was taken from each trial in the 50-100ms time window, then averaged to calculate total power. Induced power was calculated by subtracting the event related potential (ERP) from each trial, followed by performing time-frequency decomposition across trials; evoked power was computed by subtracting the induced power from the total power. Kruskal-Wallis tests with a post-hoc Dunn's test were applied to average evoked and induced gamma power between 50ms to 100ms to compare groups.

Results: There is a significant difference in evoked gamma power between groups, $X^2(3, N=94)=10.17, p=.017$. Dunn's post hoc test indicates those group differences were driven by the PMS cohort, such that children with PMS show significantly less evoked gamma power compared to TD (adj $p=.009$) (Figure 2). TSC and PHTS evoked responses were not significantly different from TD. There were no significant group differences in induced gamma power.

Conclusions: Reduced evoked gamma power in the PMS cohort is consistent with previous findings in children with ASD. These results suggest there are differences in the initial circuit processing of children with PMS, which may impact sensory processing. Future directions for this work include investigating whether reduced evoked power correlates with clinical phenotypes of ASD and PMS. Our work highlights the potential to connect deviant mTOR pathway activity and abnormal cognitive processing that may both converge across and distinguish neurodevelopmental disorders, including autism.



402.159 Examining Associations between Neural Sensitivity to Social Feedback and Loneliness in Autistic and Non-Autistic Adolescents

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Background: Loneliness increases during adolescence and is higher in individuals on the autism spectrum, which can result in multiple negative psychological such as depression and self-harm. Thus, there is crucial to understand factors that contribute to the development of loneliness among autistic and nonautistic youth. Theoretical models of loneliness based on research with nonautistic adults have identified factors that create and sustain loneliness and suggested social stimuli are perceived as more threatening and less rewarding by lonely individuals affecting brain regions encoding reward, social salience, and social cognition.

Objectives: To examine the relation between neural sensitivity to social feedback and loneliness and whether this relationship is different between autistic and non-autistic adolescents.

Methods: Our sample included 94 youth (ages 11-14, 22 autistic (AUT), 72 non-autistic (non-AUT), 37 female, 54 female, 3 gender fluid/other). Participants completed an fMRI task where they received feedback about how similar their likes and dislikes were to that of two other peers (or a computer for a nonsocial control). The positive social feedback (thumbs up) occurred when participant and peer agree, and negative social feedback (thumbs down) was given when they disagree. A nonsocial control included positive and negative nonsocial feedback. Loneliness was assessed using an adapted version of the Loneliness Rating Scale. Contrasts of interest were positive social feedback (peer positive vs computer positive) and negative social feedback (peer negative vs computer negative). Analyses focused on a-priori defined ROIs encompassing regions associated with social cognition, reward and salience. Regressions examined the effect of neural sensitivity to feedback, group, and their interaction on loneliness while controlling for age and sex for positive and negative social feedback separately.

Results: For both positive and negative social feedback models, group was a significant predictor of loneliness with AUT showing higher rates of loneliness than non-AUT (neg: $b = -13.37, t(80) = -5.12, p < 0.001$; pos: $b = -13.64, t(80) = -3.91, p < 0.001$). Neural sensitivity to negative social feedback was also positively associated with loneliness scores ($b = 80.67, t(80) = 2.09, p = 0.04$). Importantly, the interaction between neural sensitivity and group was significant for negative feedback ($b = -93.83, t(80) = -2.26, p = 0.026$). In both models this interaction was due to a strong positive relation between neural sensitivity to social feedback and loneliness in the AUT group but not in the non-AUT group.

Conclusions: Our results highlight higher rates of loneliness among autistic youth. Further, they show that adolescents who are more sensitive to social feedback, either positive or negative, have higher rates of loneliness. This relation was strongest for the autistic group and for negative feedback. AUT youth may be at greater risk of social rejection and bullying and those who are most sensitive to peer feedback may be most affected. These findings counter hypotheses of reduced reward sensitivity in autism by highlighting that autistic individuals display typical levels of neural sensitivity to social feedback and this sensitivity may be a risk factor in the development of loneliness.



402.160 Examining Emotion Dysregulation Profiles in Relation to Reward Positivity and Feedback-Related Negativity in Autistic and Non-Autistic Youth.

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Background: Emotion dysregulation (ED) refers to difficulty controlling or modulating emotions, internally and externally, which may lead to difficulties in many areas of functioning (Gross, 2008; Conner et al., 2020). ED has been proposed as a transdiagnostic mechanism that may contribute to the co-occurrence among autism and other psychiatric disorders (White et al., 2014). Electrophysiological indices of ED may be valuable in understanding ED development and associated challenges. Irritability, thought to precede ED, has been linked to neural correlates like feedback-related negativity (FRN) and reward positivity (RewP; Malhi et al., 2017; Deveney, 2019). FRN and RewP have also been associated with negative affect and difficulties improving mood (Gehring & Willoughby, 2002; Gill et al., 2024), and hence may be associated with higher rates of ED. However, there is limited research on these neural mechanisms and their relation to ED in autistic youth.

Objectives: The current study seeks to clarify the relationship of FRN or RewP with ED dysphoria (e.g., negative affect) and reactivity (e.g., externalized outbursts), and how these relationships differ across autistic and non-autistic youth.

Methods: Fifty-seven youth (39 autistic; $M_{age}=10.38$, $SD_{age}=2.99$; 50.9% male; 57.9% White, 14.1% Asian/South Asian/MENA, 7% Black, 14% Multiracial) from Northeastern US participated in this study. Parents completed a measure of ED dysphoria (EDD) and reactivity (EDR; Emotion Dysregulation Inventory; Mazefsky et al., 2018). An electroencephalogram (EEG) was recorded while youth completed a computer task of a developmentally-appropriate adaptation of the Wisconsin Card Sorting Task, where children were instructed to match the stimulus to an unannounced, changing rule (Kessel, 2019). Youth were given either positive or negative feedback based on their adherence to the rule. RewP was measured between 250 and 300 ms, while FRN was measured between 200 and 300 ms following negative feedback that might elicit an emotional response.

Results: Bivariate correlations indicated more negative FRN amplitudes related to greater EDR ($r=-.389$, $p<.01$) and greater EDD ($r=-.303$, $p<.05$) in the full sample. No associations were found between RewP and ED. When examined separately by diagnostic group, no significant relationships were found across FRN, RewP, and ED in non-autistic children. Associations between FRN and EDR ($r=-.403$, $p<.05$) remained in the autistic sample only.

Conclusions: Our findings that larger (i.e., more negative) FRN amplitudes may relate to greater ED, but not RewP, suggest that youth with more ED may have an increased response to negative feedback, and this relationship may be particularly more relevant for autistic children who are more emotionally reactive. It is possible that children with ED profiles who are exposed to repeated criticism may experience more emotional sensitivity, and thus more dysregulation (Wall et al., 2018). These findings could offer a window into the neural mechanisms of ED, and how learned behaviors from the environment may relate to brain functionality. Future research should further explore neurophysiological mechanisms of ED, especially in the context of autistic youth, which will allow for a more comprehensive understanding of ED presentation and better tailored treatment options.

402.161 Examining the Effects of Temperament on Neuroimaging Scan “Success” in Children with Autism

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Background: Clinical and behavioral protocols to enable brain imaging with children with autism and intellectual disability or higher support needs (Gabrielsen et al., 2018; Nordahl et al., 2016; Kushner et al., 2019) have expanded inclusion in neuroimaging research. Identification of characteristics associated with scan completion and collection of evaluable data will support the tailoring of support protocols to maximize scan success and the child and family experience. Previous literature suggests that temperament can be associated with success of other medical procedures, such as dental exams and sedation success for MRI/CT (e.g., Voepel-Lewis et al., 2001; Radis et al., 1994).

Objectives: To consider temperament as a child trait that will help optimize protocols and predict likelihood of scan success.

Methods: Participants included 43 children with a diagnosis of autism across two cohorts: 13 children ages 2-5 years (mean =3.9 years, $SD=0.8$; mean nonverbal IQ (NVIQ)=68.7, $SD=19.4$; 9M:4F) and 30 children ages 8-12 years (mean age=9.9 years, $SD=1.3$; mean NVIQ=54.3, $SD=16.1$; 25M:5F). Parents completed the Carey Temperament Scales (Carey & McDevitt, 1995) to report their child's behavioral style across nine categories of temperament. Questionnaire version was chosen based on nonverbal mental age, with 38 parents completing the Behavioral Style Questionnaire (3-7yrs) and 5 parents completing the Toddler Temperament Scale (1-35mos). Scan “success” was operationalized as acquiring magnetoencephalography (MEG) data (i.e., MEG machine turned on, paradigm administered) across tasks obtained using a 275-channel CTF MEG system. Dependent variables were Carey temperament z-scores across nine scales (activity level, adaptability, approach to novelty, distractibility, emotional intensity, persistence, quality of mood, rhythmicity, sensory sensitivity) and an overall manageability rating. Binary logistic regression was used to examine temperament factors associated with MEG data acquisition status.

Results: Across both cohorts, 28 (65%) children had acquired MEG data (86% in the preschool cohort and 76% in school-age cohort). There were no differences in age, $F(1,41)=0.85$, $p=0.36$, or nonverbal IQ, $F(1,41)=2.93$, $p=0.09$ for acquired status, therefore age and nonverbal IQ were removed from the regression model. Collinearity was identified between age and two of the temperament scales (emotional intensity, $r=-0.37$, $p=0.014$; distractibility, $r=-0.35$, $p=0.021$), so those scales were also excluded from the model; no collinearity was identified between nonverbal IQ and the temperament scales. Logistic regression revealed that children rated by parents as more difficult to manage (overall manageability scale) were significantly less likely to have acquired MEG data, with a COR of 2.28 (95% CI, 1.06-4.90, $p=0.03$). There was also a trend toward children with a higher ability to continue an activity in the face of distractions (persistence scale) being more likely to have acquired MEG data, with a COR of 0.38 (95% CI, 0.13-1.1, $p=0.07$).

Conclusions: Broad temperament ratings of manageability and persistence with tasks in the face of obstacles or distractions may be associated with neuroimaging scan completion. If predictive of scan outcome, there is particularly high utility in brief screening questions for manageability that can guide support protocol development for brain imaging visits.

402.162 Examining the Social Visual Pathway in Children with Autism Spectrum Disorder

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Background: The social visual pathway, including the visual motion area (MT/V5) and the posterior to anterior portions of the superior temporal sulcus (STS), specializes in processing dynamic social information (Pitcher & Ungerleider, 2021, *Trends Cogn Sci*). While aberrant STS function is well-documented in autism spectrum disorder (ASD, autism), connectivity specifically along the social visual pathway in ASD has not been explored.

Objectives: This study aimed to investigate resting-state functional connectivity within the social visual pathway in children with autism compared to typically developing (TD) children, and to explore associations between connectivity strength and clinical measures of autistic symptoms. We hypothesized that children with autism would have decreased connectivity within the social visual pathway and that the strength of the connectivity between the nodes would be associated with the severity of social but not restricted and repetitive behaviors symptoms of autism.

Methods: Resting-state fMRI data from 281 children with autism and 428 TD children (aged 6-14 years) were obtained from the Autism Brain Imaging Data Exchange (ABIDE) repository. Functional connectivity between regions along the social visual pathway (MT/V5, posterior STS, middle STS, and anterior STS - see Figure 1 for a schematic representation of these regions of interest) was examined using partial correlation models, controlling for age, data collection site, sex, IQ, and head motion. Associations between functional connectivity strength and symptom severity measured by the Autism Diagnostic Observation Schedule (ADOS) and the Social Responsiveness Scale (SRS) were analyzed using generalized linear models.

Results: Children with autism showed significantly lower connectivity between the right posterior STS (rpSTS) and right middle STS (rmSTS) compared to TD children ($p = .006$, Bonferroni-corrected threshold $p < .008$). No significant group differences were found for other connections within the social visual pathway before or after correction for multiple comparisons. Reduced rpSTS-rmSTS connectivity was significantly associated with higher social symptoms as measured by ADOS Social Affect raw scores in children with autism ($p = .044$) and SRS Social Communication Index raw scores across both children with autism and TD children ($p = .006$). No significant associations were found with ADOS Restricted and Repetitive Behavior raw scores or SRS Restricted and Repetitive Behavior Index raw scores.

Conclusions: These findings demonstrate that connectivity within the right-lateralized social visual pathway is disrupted in school-aged children with autism, specifically between the posterior and middle STS. This disruption is associated with social impairment severity but not with restricted and repetitive behaviors, suggesting its specific role in the social deficits observed in ASD.



402.163 Exploring the Biological Mechanisms Underlying Co-Occurance of Autism and Epilepsy

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Background:

Epilepsy and autism spectrum disorder (ASD) are clinically distinct disorders but have significant overlap. Comorbid epilepsy and ASD are predictive of more severe outcomes, hence, there may be a shared neurophysiological mechanism underlying these two conditions. Better definition of the mechanistic similarities between autism and epilepsy will expand our understanding of this comorbidity and may open new pathways for targeted therapies.

Objectives:

Male participants ages 8-17 years old both with and without ASD (and no history of clinical epilepsy) were recruited (21 TD; 20 ASD-) and underwent psychological evaluation followed by the collection of magnetoencephalographic (MEG) data during resting-state, somatosensory and motor task conditions, followed by a brain magnetic resonance imaging (MRI) scan including magnetic resonance spectroscopy (MRS).

Methods:

Dependent variables determined from MRS included gamma-aminobutyric acid (GABA) concentrations assessed from MEGAPRESS applied to voxels placed at regions of interest (left and right sensorimotor hand motor areas). We predicted that children with ASD would show reduced in vivo (MRS) GABA levels and be directly associated with atypical epileptiform activity in children with ASD.

Results:

Consistent with previously published findings, the current study showed that MRS GABA levels are significantly lower in children with ASD, compared to controls (TD: $5.64E \pm 0.15$; ASD $5.16E \pm 0.16$; $p < 0.05$) in a linear mixed model (LMM) with Group and Hemisphere as fixed effects and Subject as a random effect.

MEG analysis using the SAMg2 "spike-detection" algorithm identified epileptiform activity in the resting MEG data from 11 of 20 participants with ASD (55%; 3 x higher than 4/21 TD with sharply contoured resting activity (18.75%; chi-squared $p < 0.05$). SAMg2 analysis of each 2-minute resting MEG data segment yields localized brain areas where "sharp" features can be identified in time (left virtual sensors) and space (brain color maps). Note that there are common "sensorimotor" brain areas active between the ASD- subjects where significant "spikiness" was observed.

ASD cases with epileptiform activity show reduced GABA levels vs. ASD cases without epileptiform activity 4.9 ± 0.2 vs. 5.9 ± 0.2 (LMM) with epileptiform activity present/absent as a fixed effect and subject as a random effect $p = 0.048$. A nonsignificant trend suggests that the presence of epileptiform activity, and low GABA levels, may be associated with elevated SRS scores, suggesting a clinically-relevant correlate.

Conclusions:

We replicated the demonstration that MRS measures of GABA levels from sensorimotor brain areas are reduced in ASD vs TD. Participants with ASD were significantly less likely to fall asleep during our 40-minute resting MEG recordings. Despite sleep differences, participants with ASD exhibited 3x the epileptiform activity than observed in TD (55% of ASD-). The observation of epileptiform activity was not straightforwardly associated significantly associated with any of the acquired clinical measures, and thus the consequence of this activity for the individual remains an open area for future research. ASD participants who showed epileptiform activity had significantly lower GABA levels than those who did not, hinting at a potential mechanism whereby relatively low GABA levels may result in hyperexcitable (i.e., epileptiform) signaling.

402.164 Feasibility of Measurements of Cerebral 3-[¹⁸F]Fluoro-5-(2-pyridinylethynyl)Benzonitrile Uptake and Fragile X Messenger Ribonucleoprotein and Neuropsychological Measurements in Men with Fragile X Syndrome

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Background: Multiple lines of investigation provide evidence of glutamatergic dysfunction in people with fragile X syndrome (FXS). Although animal models of FXS demonstrated amelioration of behavioral symptoms after the administration of glutamatergic agents, multiple clinical trials of glutamatergic agents demonstrated no beneficial effects on humans with FXS. A comprehensive review of unsuccessful clinical trials of glutamatergic agents for humans with FXS identified the lack of a biomarker as a key component for successful clinical trials. A quantitative measurement of target engagement of the metabotropic glutamate receptor subtype 5 (mGluR₅) in the living human brain can be obtained by means of positron emission tomography (PET) after the intravenous (IV) bolus injection of 3-[¹⁸F]fluoro-5-(2-pyridinylethynyl)benzonitrile ([¹⁸F]FPEB). **Objectives:** We seek to determine the feasibility of comprehensive measurements of fragile X messenger ribonucleoprotein (FMRP), genetic tests for FXS, and neuropsychological tests [Stanford-Binet Intelligence Scales, 5th Edition (SB-5), Hopkins Verbal Learning Test-Revised (HVLRT), Vineland Adaptive Behavior Scales, 3rd Edition (Vineland-3), Autism Diagnostic Observation Schedule, 2nd Edition (ADOS-2), and the Intra-Extra Dimensional Set Shift (IED), a test of visual discrimination and attentional set formation maintenance, shifting, and flexibility of attention, and the One Touch Stockings of Cambridge (OTS), a test of executive function that assesses spatial planning and working memory subdomains, from the Cambridge Neuropsychological Test Automated Battery (CANTAB)], along with MRI and PET to measure mGluR₅ target engagement in men with FXS.

Methods: Two men with the full mutation of FXS (>200 CGG repeats) aged 19 to 41 (mean 27.6 ± 9.4) years underwent determination of FMRP, genetic testing for FXS, a neuropsychological battery, and mock scanner training before PET for 90 minutes after the IV bolus injection of V bolus injection of 178.9 ± 7.06 MBq [¹⁸F]FPEB with specific activity of 722.7 ± 114.8 MBq/millimole, and a mass of 0.055 ± 0.007 micrograms.

Results: The Image demonstrates transverse, sagittal, and coronal timages of [¹⁸F]FPEB in a 24-year-old man with FXS, a 27-year-old man with FXS, and a 27-year-old man with typical development (TD). Nondisplaceable binding potentials (BP_{ND}) with the multilinear reference tissue method with two parameters (MRTM2) in cortical regions [medial temporal (mTp) and posterior cingulate (pCg)] and subcortical regions [caudate nucleus (CN), putamen (Pu), and thalamus (Th)] were markedly lower than those in age- and sex-matched participants with typical development. Neuropsychological scores confirm deficits in spatial planning, working memory, rule acquisition and reversal, and socialization, as well as intellectual disability and autism spectrum disorder.

Conclusions: A comprehensive assessment of men with FXS including genetic and FMRP measurements, MRI and PET scans, and a thorough neuropsychological battery is feasible when performed by investigators who are experienced in assessing adults with neurodevelopmental disorders. The utilization of mock scanner training by behavioral psychologists is a crucial step to train participants to be able to complete MRI and PET scans. The proposed protocol will provide investigators the crucial information (mGluR₅ target engagement and measurements of FRMP, genetic tests for FXS, and crucial neuropsychological variables) for optimal clinical trials of glutamatergic agents for people with FXS and related conditions.

**402.165** Functional Connectivity and Sensory Processing in Autism: A Systematic Review of Neural Correlates and Behavioral Relationships

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Background: Advances in neuroimaging have facilitated a deeper understanding of the neural mechanisms underlying sensory processing differences in individuals on the autism spectrum. Sensory processing differences are a common feature of autism and can significantly impact daily functioning and quality of life. There is a need to synthesize findings related to brain regions and networks involved in the brain-behavior relationships of sensory processing differences.

Objectives: This systematic review aims to synthesize current research on the relationship between functional connectivity and behavioral measures of sensory processing in individuals on the autism spectrum. The review seeks to identify common neural networks and brain regions associated with sensory processing and examine the strength and consistency of the correlations reported across studies.

Methods: The review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews (PRISMA) guidelines.

Comprehensive searches were performed across six databases: PubMed, PsychINFO, Embase, CINAHL, Scopus, and Web of Science. Articles were imported into Covidence for screening. Two independent reviewers screened titles, abstracts, and full texts using the following inclusion criteria: (1) peer-reviewed journal articles published in English, (2) participants diagnosed with autism, (3) use of functional connectivity measures, including functional MRI (fMRI), functional near-infrared spectroscopy (fNIRS), diffusion tensor imaging (DTI), and diffusion-weighted imaging (DWI), (4) use of standardized sensory processing measures, and (5) statistical correlation between functional connectivity outcomes and sensory processing measures.

Results: Out of 6,549 studies screened, 15 studies met the inclusion criteria. Most studies ($n=11$, 73%) used fMRI, with two utilizing DTI and one using proton spectroscopy. The majority of studies (80%) were conducted in the United States. Sample sizes ranged from 15 to 78 participants, with an average sample size of 35.86. Participants' ages ranged from 3.5 to 55 years, with 67% of studies focusing on children aged 7 to 18 years. Resting-state paradigms were employed in 73% of studies, while 20% used task-based paradigms. Sensory processing was most frequently assessed using the Sensory Profile (including the Adolescent/Adult Sensory Profile and Short Sensory Profile). All but one study reported significant correlations between functional connectivity and sensory processing measures. Brain regions and networks associated with sensory processing included the sensorimotor cortex ($n=4$), insular cortex ($n=5$), visual cortex ($n=3$), amygdala ($n=3$), thalamocortical connectivity ($n=3$), and occipital cortex ($n=2$). Networks implicated included the Default Mode Network ($n=2$) and the Salience Network ($n=3$). However, the strength and direction of correlations between these regions varied across all studies limiting the ability to draw cohesive conclusions, especially regarding specific and localized connectivity patterns.

Conclusions: Taken together, studies show that sensory processing behaviors in autism are associated with differences in functional connectivity patterns. These findings also underscore the complexity of brain-behavior relationships in sensory processing among autistic individuals. However, inconsistencies in connectivity patterns highlight the need for further research to refine our understanding of these relationships. Future studies would benefit from increased sample sizes and open data sharing to facilitate meta-analyses and promote a more cohesive understanding of the neural underpinnings of sensory processing differences in autism.

402.166 Functional Connectivity between Regions Implicated By Acquired Prosopagnosia Predict Emotional Face Processing Ability in Autism

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Background: Difficulty with social communication and joint attention are hallmark features of autism and may be linked to atypical processing of facial information. Neuroimaging studies have identified numerous brain regions that demonstrate group-level differences in autistic participants during face processing tasks; however, it remains unclear if these observations are causal or compensatory. Previous work from our lab has used lesion network mapping (LNM) to identify a brain network causally associated with face recognition deficits in patients with acquired prosopagnosia (i.e., face blindness after stroke). While there is increasing evidence that consistent brain regions are involved in generating similar symptoms across clinical populations, the generalization of these findings to developmental disorders remains an empiric question.

Objectives: Here, we determine whether the brain network implicated by acquired prosopagnosia is associated with variation in face processing abilities in adolescents with and without autism.

Methods: We collected fMRI and behavioral data (including the Reading the Mind in the Eyes test (RMIE)) from 45 adolescent participants, 21 with a diagnosis of autism spectrum disorder. Using resting-state data and RMIE scores, we localized a cohort-specific right fusiform face area (rFFA), as well as frontal regions of interest (ROIs) that were also implicated by our LNM of prosopagnosia. For each participant, we then calculated the functional connectivity/temporal correlation between the rFFA with each of the frontal ROIs. Using multivariate linear regression, we assessed whether these ROI-ROI correlations were predictive of face processing ability, controlling for autism diagnosis, ADHD diagnosis, sex, full-scale IQ (FSIQ), and age.

Results: Participants with autism performed significantly worse on the RMIE ($t(43)=-3.778$, $p\text{-value}<0.0005$). The cohort-specific rFFA was localized to MNI coordinates 30, -64, -14; this ROI was significantly functionally connected to two frontal ROIs: the Anterior Cingulate Cortex (ACC:-4,30,43) and left Middle Frontal Gyrus (MFG:-25,16,54). The total regression model was significant ($F(7,37)=7.9$, $p<0.001$) and explained approximately 52.3% of the variance in RMIE score. In this model, rFFA-ACC functional connectivity was a significant predictor of RMIE score ($b=-13.04$, $t(37)=-2.5$, $p=0.017$), as were age ($b=0.17$, $t(37)=4.7$, $p<0.001$) and FSIQ ($b=0.11$, $t(37)=2.47$, $p=0.010$). Interestingly, while the interaction between rFFA-ACC connectivity and diagnostic group membership was not statistically significant ($p=0.733$), separate analyses for each group revealed that rFFA-ACC correlation ($p=0.034$) and age ($p=0.001$) were significant predictors of RMIE score for the autism group, but not in the non-autism group.

Conclusions: Lesion network mapping of acquired prosopagnosia suggested the importance of connectivity between the rFFA and multiple regions of the frontoparietal control network. In the current study, we identified that differences in rFFA-ACC functional connectivity predict differences in face processing ability independent of age and IQ. Of note, these differences appeared to be potentially stronger or even unique to the group of participants with autism.

402.167 Hyperconnectivity between Thalamic Subregions and Functional Brain Networks in Autistic Adults

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Background: Autism Spectrum Disorder (ASD) has been associated with atypical brain connectivity (Geschwind & Levitt, 2007). The thalamus is a crucial hub integrating information across multiple functional brain networks (Hwang et al., 2017) and may contribute to atypical brain connectivity in autism. Previous work mostly focused on connectivity between the whole thalamus or functionally defined thalamic subregions with broad cortical regions. Prior results suggest atypical sensory information filtering and somatosensory-motor integration. It is unclear how specific thalamic nuclei may contribute to atypical connectivity profiles.

Objectives: The main goal was to characterize the functional role of anatomical thalamic subregions within large-scale brain network organization in autism. To increase spatial specificity, we subdivided the thalamus into seven individual and five grouped nuclei to investigate differences in volumes and functional connectivity to seven cortical brain networks. We hypothesized reduced thalamic volumes, and atypical functional connectivity (particularly to sensory and somatosensory-motor networks) in autistic compared to neurotypical adults.

Methods: We used magnetic resonance imaging (MRI) to measure brain structure and functional connectivity (FC, timeseries correlation of resting-state functional MRI) in adult autistic ($n = 32$, female = 11) and neurotypical comparison participants ($n = 47$, females = 30). Since the total sample differed in age, sex, intellectual functioning, and head motion, we conducted matched sample analyses (volume: $n = 69$, 30 ASD; FC: $n = 52$, 27 ASD). We subdivided the thalamus into 13 subregions per hemisphere (anteroventral (AV), laterodorsal (LD), ventral anterior (VA), lateral posterior (LP), ventral lateral (VL), ventral lateral posterior (VLp), ventral posterior (VP), centromedian and intralaminar (CeM), medial, pulvinar, midline, lateral geniculate (LGN), medial geniculate (MGN)) using a probabilistic atlas in native space (Iglesias et al., 2018). Functional data was preprocessed and denoised following previously outlined procedures (Kliemann et al. 2024). We assessed FC between thalamic subregions and seven functional networks (Yeo et al., 2011) averaged across hemispheres. Main effects and interactions were assessed with repeated measures analyses of variances, while interactions with the factor group were further explored with Bayesian analyses to estimate evidence for the null and alternative hypotheses.

Results: Structural analyses (corrected for intracranial volume) suggested similar subregion volumes across groups ($F(1) = 0.014$, $p = 0.9$). Functional analyses (corrected for head motion) showed overall increased FC in the autistic group ($F(1) = 6.891$, $p = 0.012$), as well as an interaction between nuclei, network, and group ($F(72) = 1.623$, $p = 7.7e-4$). Post-hoc analyses suggested strongest evidence for group differences in visual (AV, LGN, Midline, VL, VLp, Pulvinar), somatosensory-motor (midline, VA, VL, VLp), dorsal-attention (LGN, midline, VLp) and default mode (AV, Pulvinar) networks.

Conclusions: Thalamic subregion volume did not differ significantly between groups, while thalamo-cortical connectivity was generally increased in the autistic group with idiosyncratic effects across subregions and networks. Our preliminary results suggest that atypical functional connectivity of thalamic subregions may contribute to large-scale brain network organization in autistic adults. Future work should characterize heterogeneity (within and across individuals, and samples) as well as brain-behavior relationships of thalamo-cortical connectivity.

402.168 Identifying Differences in Resting State Brain Network Activity between Children Diagnosed with Autism Versus ADHD Using Deep Domain Generalization

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Background: Researchers aim to identify features of brain activity associated with neurodevelopmental conditions to better understand their etiology and biological bases. Issues that preclude the identification of generalizable associations include highly correlated features and high-dimensional feature spaces. Factor models provide a natural way to parse high-dimensional, correlated feature spaces by learning compressed representations with respect to orthogonal groupings of features (i.e., factors). A common approach is to first apply a dimensionality reduction technique that decomposes data into a compressed representation and then regress on the reduced space. However, such approaches may fail to generalize if a large portion of feature variance is related to individual-specific variation, rather than variance related to group differences. Recent machine learning approaches (e.g., domain generalization) attempt to provide a solution wherein representations invariant to variance specific to individuals (i.e., “domains”) are learned.

Objectives: Autism and attention-deficit hyperactivity disorder (ADHD) are neurodevelopmental conditions that often co-occur. Understanding the neural basis of the overlaps and distinctions between these two conditions could help lead to improved therapies and outcomes. Our objective was to identify factors of neural features that differentiate between brain activity of children diagnosed with autism versus children diagnosed with ADHD using a domain generalization approach.

Methods: Resting state (RS) electroencephalography (EEG) was recorded from 93 children (75 male, 18 female) ages 3-8 years old, 46 of whom were diagnosed with autism and 47 of whom were diagnosed with ADHD. EEG was preprocessed via an automated, multi-step process and partitioned into 1-second-long windows. Power spectral density and cross-power spectral density features were generated for each window for frequencies 1-55 Hz. We employed a factor model parameterized by neural networks to separately model both shared group variance and variance specific to individuals. Our model decomposed features into a lower-dimensional, domain-invariant representation. Subsequently, a logistic regression classifier was trained using the lower-dimensional “scores” as input to predict diagnosis. This process was evaluated via a group 5-fold cross-validation scheme. Classifier accuracy was quantified using area under the receiving operator characteristic (AUROC) curve. This process was repeated using principal component analysis (PCA) for the factor model to provide a benchmark. We qualitatively evaluated the learned representations by visualizing factors weighted by the learned logistic regression coefficients.

Results: Diagnostic prediction using scores produced by our domain-invariant factor model resulted in an AUROC of 0.64 ± 0.05 . Prediction using scores produced by PCA produced an AUROC of 0.61 ± 0.04 . Visualization of the learned representations (Figure 1) revealed that children diagnosed with ADHD exhibited greater global theta (5-7 Hz), alpha (8-10 Hz), and beta1 (11-20 Hz) activity. Children diagnosed with autism exhibited more prominent frontal beta2 (21-30 Hz) and gamma (> 30 Hz) activity as well as greater posterior delta (1-4 Hz) activity.

Conclusions: Our approach improved downstream prediction of autism versus ADHD diagnoses, indicating that representations learned via our domain generalization approach were less correlated with individual-specific variance. These results demonstrate that domain generalization may provide a way for researchers to mitigate the effects of individual-specific variance in neural association studies.



402.169 Increased Medial Prefrontal Activation during Introspective Evaluation of Emotion in Autistic Adolescents

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Background: Adolescence is marked by significant neuroplasticity involving gray and white matter pruning that refines connectivity among widely distributed brain systems. These changes support more complex social and adaptive behaviors. This substantial growth in adolescence, however, may also produce imbalances between neural systems due to their potentially different growth trajectories. In particular, imbalances between the subcortical reward/affect system and the prefrontal cortical system are considered to predispose adolescents to increased emotional reactivity, sensitivity to peer influence/criticism, and negative affect, which are linked to affective mental health problems, including depression. Given past evidence of atypical prefrontal development in autism, it is possible that such imbalances are more pronounced in autistic adolescents predisposing them to greater risk of affective problems.

Objectives: Evaluate severity of affective problems and brain activity during a well-validated paradigm for affective processing, Sadness Introspection Paradigm (SIP), in autistic and non-autistic adolescents.

Methods: Participants were 15-18 year old autistic and non-autistic adolescents. The severity of affective problems was assessed using the Emotion Dysregulation Inventory (EDI). T1 and echo planar images (EPI) during the SIP were acquired. The SIP was implemented as a mixed design with two conditions involving evaluation of either affective (sadness) or physical (nose length) features of face stimuli. The stimulus pictures included male and female faces with sad, happy, angry, or neutral expressions. Participants were instructed to rate, on a 4-point scale, how sad they felt when they looked at each picture or how long the nose was. The EPI images were preprocessed using the Analysis of Functional NeuroImages (AFNI). The images were time shifted and motion corrected. Participants with fewer than 80% of images remaining after censoring images >0.9 mm framewise displacement were excluded. 14 autistic and 21 non-autistic participants were included in the further analysis. 3dDeconvolve from AFNI was used to model individual level data, and 3dMVM was used to examine group-level responses related to the conditions and their interactions with group.

Results: The autistic group reported greater dysphoria and emotion reactivity problems on the EDI. Several prefrontal areas showed differential activation by group during the SIP. During the introspection of sadness, the autistic group showed higher ventromedial and dorsomedial prefrontal activation compared to the non-autistic group. During the evaluation of physical features of faces, the autistic group showed reduced activation in the canonical attention-related areas, including the frontal eye field and intraparietal sulcus.

Conclusions: The observed increase in medial prefrontal activation in the autistic group is consistent with activation patterns associated with depressive disorders and negative mood. The dorsomedial prefrontal area has been implicated in emotion regulation via emotional awareness and self-referencing, and elevated activation in the area has been reported in adolescents and adults with major depressive disorders. The ventral prefrontal area has been implicated in regulation of negative moods due to its connection to the amygdala. These findings point to the significant role of prefrontal cortical brain regions in the emergence of affective problems in autistic adolescents.

402.170 Individualised Mapping of Neural EEG Responses for Neurodevelopmental Populations in a Multiverse Space

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Background:

Autism studies have traditionally focused on group differences while ignoring individualised approaches. Studies furthermore focus on one or two brain functioning metrics, for example the latency of the neural response to faces. This narrow focus hinders advancement of individualised approaches. One solution is using machine learning to create a multiverse space of brain responses where metrics from similar mechanisms are located at close distances. This method further allows for modelling individualised maps of brain responses across the multiverse space and examine how someone's responses vary across the space.

Objectives:

We aimed to create a multiverse space of electroencephalography (EEG) measures from social neuroimaging tasks in a large neurodiverse sample.

Methods:

We extracted 382 EEG metrics from 2 EEG tasks collected within the Longitudinal European Autism Project in 500 6 to 30-year-old autistic and non-autistic people. From the FaceERP task, we extracted ERP latency and amplitude (P1, N170), spectral power, and event-related oscillations. From the dynamic videos task, we calculated spectral power, aperiodic slope and exponent, and functional connectivity.

To create the space, we applied multidimensional scaling to the EEG metrics from a subset of 120 people. We validated the space by generating individual computational models of responses across the space within a different subset of 109 people using Gaussian Process Regression modelling. We correlated the model predicted values with the observed values for the metrics excluded from training.

Finally, we correlated the metrics within the space with IQ, adaptive skills, and autistic traits (using the Vineland Adaptive Behaviour Scales-Second Edition: VABS-II, the Social Responsiveness Scales, Second Edition: SRS-2, and Repetitive Behaviours Scale-Revised: RBS-R) to examine the meaningfulness of the space.

Results:

The multiverse space revealed EEG metrics for different tasks are spread across the space. Metrics from similar analytic signal processing approaches are clustered together (Figure left).

For the validation, computational models for brain responses across the space revealed intra-individual variability in patterns (Figure middle). Correlations between model-predicted and observed values for the metrics were above 0 suggesting meaningful information is embedded within the space (*median* = .58, $Z = 9.06$, $p < .0001$).

The topography of the multiverse space varied by age where correlations with EEG metric values varied between -.83 and .46, and revealed a gradient from a negative to positive association diagonally (bottom left to top right) across the multiverse space (Figure right). No such strong associations across topography were observed for IQ ($-.34 \leq r's \leq .28$), adaptive skills ($-.51 \leq r's \leq .56$), or autistic traits (SRS SCI domain ($-.34 \leq r's \leq .32$); RBS-R total ($-.35 \leq r's \leq .32$)).

Conclusions:

Metrics based on similar analytic approaches provide similar information across social tasks. In addition, there is variation between individuals in neural responses across the multidimensional space individual variation among these. Future research may implement this approach to select metrics of interest for discovery research or clinical research for developing personalised support via neuro-adaptive sampling and real-time EEG techniques.



402.171 Integrating Automated Artifact Detection and Expert Review in EEG Signal Processing

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Background:

Electroencephalography (EEG) is widely used in studies involving children, including those with neurodevelopmental disorders such as autism, due to its non-invasive nature, high temporal resolution, and relative robustness to motion artifacts compared to other imaging techniques. However, artifacts from eye movements, muscle activity, and other sources can still contaminate the EEG signal, especially in studies involving individuals who may have difficulty following instructions to minimize movement during data collection. The pyLossless EEG processing pipeline was developed to combine automated artifact identification with expert manual review, to efficiently remove artifacts from the EEG signal. This semi-automated approach, which includes manual review, may be particularly useful in studies involving children with neurodevelopmental disabilities, due to the frequent presence of artifacts and the effort required to collect the data.

Objectives:

Since the pyLossless pipeline was initially demonstrated on a sample of adults, we sought to evaluate its performance on a cohort of children with neurodevelopmental disorders and with typical development, to determine its effectiveness in removing artifacts from relatively noisy EEG data.

Methods:

We applied the pyLossless EEG processing pipeline to EEG data from a heterogeneous sample of 75 children, including children with autism (n=46; a subset of whom were minimally verbal, n=22), typically developing children (n=23), and children with Angelman Syndrome (n=5). The EEG data were collected using a 128-channel system with a sampling rate of 500 Hz. The data were pre-processed in Python using the PyLossless pipeline, followed by expert manual review. The pipeline flagged potential noisy channels, time segments, and independent components, and the manual review served to confirm or reject the identified artifacts. We computed a proxy metric of the signal-to-noise ratio (SNR) data after processing to evaluate the effectiveness of the artifact identification process.

Results:

To evaluate the pipeline, we compared the evoked potentials between the raw and pre-processed data after automated and manual review. First, we segmented the data at the onset of the stimulus of interest and computed the maximum peak-to-peak (PTP) amplitude of each channel for each epoch. For the processed data, we took the mean across epochs of these PTP values, whereas for the raw data, we used the median to account for the presence of artifacts. The root mean squared error (RMSE) was computed between the aforementioned mean and median values as a measure of the signal-to-noise ratio. A lower RMSE indicates a better match between the processed and raw data. The results showed that both the fully automated and manual review steps improved the signal-to-noise ratio compared to the raw data. However, incorporating manual review improved the SNR particularly in noisier datasets.

Conclusions:

We evaluated the performance of the semi-automated pyLossless pipeline on EEG data from a cohort of children with autism. While many EEG processing pipelines are designed for data from adult neurotypical populations, the results suggest that manual review of EEG data is especially beneficial for noisy datasets. This work provides a framework for future studies to evaluate the effectiveness of automated pre-processing pipelines on data from neurodevelopmental populations.

402.172 Cleaning EEG Data By Combining Automated Artifact Identification with Expert Manual Review.

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Background:

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We evaluated the performance of the semi-automated pyLossless pipeline on EEG data from a cohort of children with autism. While many EEG processing pipelines are designed for data from adult neurotypical populations, the results suggest that manual review of EEG data is especially beneficial for noisy datasets. This work provides a framework for future studies to evaluate the effectiveness of automated pre-processing pipelines on data from neurodevelopmental populations.

402.173 Evaluating the Association between Early Changes in EEG Aperiodic Components and Language Outcomes in Infants with and without Autism

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Background:

Toddlers with autism often experience co-occurring language delays, with 30% remaining minimally verbal. Despite the prevalence of language impairments, the neurobiology underlying language challenges in autism is poorly understood. Previous research, including ours, has shown reduced EEG power across multiple frequency bands (e.g., theta, alpha, gamma) in 3-6 month-old infants with autism siblings, followed by accelerated increases in later years. This pattern may reflect changes in aperiodic components that give rise to broad-band power differences. Moreover, it remains unclear whether changes in aperiodic components contribute to later language delays in autistic infants. Here, we apply new methods to parametrize the power spectra into aperiodic (broad-band neuronal firing) and periodic (oscillatory activity) components to examine whether changes in aperiodic components during the first year of life are linked to autism and later language outcomes.

Objectives:

Leveraging data from three prospective longitudinal studies—two focused on infants with an elevated familial likelihood (EFL) of autism due to having a sibling with autism (Sibling projects) and one focused on elevated likelihood of autism due to living in a low-resource household (Low-Resource project)—we aimed to assess whether infants later diagnosed with autism exhibit altered changes in EEG aperiodic components during the first year of life. Furthermore, we examined whether these developmental changes in EEG features are associated with language outcomes.

Methods:

Frontal aperiodic and periodic components were calculated using SpecParam from 5-minute resting-state EEG data at 3 or 4 months and at 12m, and language scores were assessed via the Mullen Scales of Early Learning at 18 or 24 months. Autism diagnosis was evaluated by Autism Diagnostic Observation Schedule-Second Edition. Linear mixed-effects models were used to assess changes in EEG components over time, and linear regression, with age and sex as covariates, was employed to examine associations between EEG features and language outcomes.

Results:

First, from the Sibling projects, at 3-months of age, EFL infants, regardless of autism diagnosis exhibited significantly lower aperiodic activity from 6.6-55Hz ($p < 0.05$; Figure 1A). However, infants with later autism diagnosis exhibited significantly greater increases in aperiodic activity (e.g. total aperiodic power and aperiodic offset) from 3-to-12 months, compared to both EFL-noAutism and Low-likelihood-noAutism infants (Figure 1B). Similarly, from the Low-Resource project, infants later diagnosed with autism also exhibited reduced aperiodic activity at 4 months old, and showed significantly greater increases in aperiodic activity with age compared to non-autistic infants. (Figure 1C). Finally, exploratory analyses from the Sibling project showed that greater changes in aperiodic offset and slope from 3-to-12 months were associated with lower language abilities at 18 months in infants with autistic siblings, and this relationship was stronger in the autism group (Figure 1D).

Conclusions:

Early age-dependent changes in EEG aperiodic power may serve as a potential biomarker for autism and/or language development. We hypothesize that greater increases in early aperiodic activity may reflect over compensation of early aberrant neural activity, resulting in decreased ability to process language inputs during early learning.

**402.174 Characterizing Functional Brain Networks in Children with and without Autism**

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Background:

Autism is a heterogeneous neurodevelopmental disorder, with common co-occurring challenges such as language and cognitive delays. However, the underlying neurobiology of autism as it relates to behavioral challenges remains poorly understood. One promising framework for understanding the neurobiology of autism focuses on abnormal brain oscillations, which are thought to arise from an altered balance between excitation and inhibition. This balance is essential for shaping neural connectivity, and previous studies have found inefficient, suboptimal connectivity and disorganized large-scale brain networks in individuals with autism. Notably, prior EEG studies have reported significant differences in the alpha frequency range, which may reflect a cascading effect of early disruptions in thalamocortical connections. Early disrupted network organization may compromise complex functions, such as language, which depend on flexible communication between brain regions. However, most studies investigating these neural alterations have been cross-sectional and focused on older children or adults, which overlooks the dynamic development of brain networks during early childhood.

Objectives:

Building on previous research demonstrating sub-optimal networks among older children and adults with autism, this study aims to: 1) characterize EEG graph-theory-based functional network trajectories in children with and without autism in the first three years of life and 2) assess whether differences in the trajectory of functional networks help explain behavioral challenges of autism, such as language delays.

Methods:

High density resting-state EEG data was collected from 243 participants (63 Autism; 180 no-Autism) from two prospective longitudinal projects spanning 3-to-36 months. Whole-brain functional connectivity (e.g. coherence) and graph theory metrics (e.g. local efficiency - clustering coefficient; global efficiency - path length) were computed. Standardized assessments (i.e., Autism Diagnostic Observation Schedule, Mullen Scales of Early Learning) were administered to assess autism outcomes at 24 or 36 months. Generalized additive mixed models was used to assess changes in EEG components over time, and linear regression, will be employed to examine associations between EEG features and language/cognitive outcomes.

Results:

Preliminary analyses reveal that peak alpha (4-11 Hz) connectivity increases with age from 3 to 36 months in both children with and without autism (Figure 1A). However, the trajectory of alpha connectivity magnitude differs between the two groups. While both autistic and non-autistic toddlers show increases in alpha connectivity up to 2 years of age, by 36 months, toddlers with autism demonstrate reduced global alpha connectivity (Figure 1B, C), particularly between frontal-temporal and central-posterior regions, compared to their non-autistic peers. This trend is also evident in network topology, where toddlers with autism exhibit reduced local network efficiency (e.g. lower clustering coefficient; Figure 1D), indicating less efficient communication within localized regions of the brain compared to non-autistic children.

Conclusions:

These preliminary findings highlight age-related changes in peak alpha connectivity, alongside group-level differences in network organization at 36 months. Developmental changes in alpha oscillations may reflect the maturation and refinement of neural networks, with our results suggesting reduced efficiency and less flexible communication between distributed brain regions in autism.

**Poster Session****403 - Early Development (< 48 months) I**

May 1st, 2025, 12:30 PM - 1:30 PM - Hall 4A

403.175 A Systematic Review and Meta-Analysis of Atypical Visual Attention Towards Non-Social Stimuli in Preschoolers with Autism

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Background: Research on attention towards non-social stimuli in preschoolers with autism has increased over the past decade, as more studies investigate visual non-social stimuli as a potential biomarker. However, studies show mixed results—some report elevated non-social attention in children with autism, while others do not. This could potentially be due to stimulus content utilized across studies. It has been suggested that stimuli relating to common circumscribed interests (CIs) (machines, fractals etc.) elicit more attention than non-CI related stimuli. Currently it is unclear if this special status of CI-related stimuli is already present in preschoolers with autism, with CIs typically being observed in older children.

Objectives: A meta-analysis was conducted to gauge the extent of potential attentional biases towards non-social stimuli in preschoolers with autism. We examined eye-tracking studies on children with autism between 8 and 60 months of age, which deployed stimuli depicting content related to common CIs, and studies using non-CI non-social stimuli. We hypothesized that (1) non-social stimuli would attract more visual attention in children with autism than in typically developing (TD) controls; (2) CI stimuli elicit more attention from children with autism compared to non-CI non-social stimuli; (3) attention to CIs is associated with more severe autism symptoms.

Methods: 31 eye-tracking studies including attentional measures (gaze duration, number of fixations etc.) towards non-social stimuli were identified, and effect sizes were standardized into Hedges g . First an overall meta-analysis for general non-social attention including all studies was conducted. Both traditional restricted maximum likelihood as well as a novel robust Bayesian meta-analysis (RoBMA-PSMA) models were used for study synthesis. A follow-up subgroup analysis, splitting studies based on stimulus employed (CI, non-CI), was performed to measure the effect of stimulus content. Lastly a series of meta-regressions was performed to control for unaccounted heterogeneity and test for associations between age, sex, stimulus dimension (static / dynamic), non-verbal DQ, symptom severity and effect sizes. Variables were analyzed separately due to the small number of studies, by including them as covariates to the previous model.

Results: The initial overall sample showed small ($g = 0.39$) but significantly higher attention towards non-social stimuli for the autism group than in TD. However, the follow-up subgroup analysis where studies were split based on stimulus type revealed no significant differences for non-CI stimuli, but significant large effects on attention allocation when CI related stimuli were used ($g = 0.69$). No associations were found between attention to CI stimuli and age, sex, stimulus type, nonverbal skills and autism severity. Sensitivity for the symptom severity regression was limited due to underreporting of clinical measures in included studies.

Conclusions: Our findings show that CIs-related stimuli contribute to elevated non-social attention in autism. None of our regressions explained meaningful variance, suggesting a universal effect not limited to children with specific characteristics. Results emphasize the need for evaluation of stimulus content in study design, especially in research focused on identifying attentional biomarkers. It further highlights the potential role of CIs in biomarker development, calling for more research into an understudied symptom area.

403.176 ASD Identification in Early Intervention: Exploring Optimal M-CHAT-R/F Thresholds in Children with Developmental Delays

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Background:

The Modified Checklist for Autism in Toddlers, Revised, with Follow-up (M-CHAT-R/F), is widely used in early intervention settings to identify children with an increased likelihood for autism spectrum disorder (ASD). Identifying the optimal threshold for maximizing sensitivity in populations of children with identified delays is warranted.

Objectives:

This study aimed to evaluate the predictors of ASD diagnosis and the screening performance of the M-CHAT-R/F in a sample of children referred to Part C, with a focus on identifying an M-CHAT-R/F threshold to improve the accurate identification of children with likely ASD.

Methods:

The sample included 114 children (71.1% male), with an average age of 23.04 months (SD=4.89). The racial composition was 49.1% White/Caucasian, 42.1% Black/African American, 2.6% Hispanic/Latino, 1.8% Asian, and 4.4% identifying as 2+ races. After identification through Part C and subsequent referral for evaluation, 84.2% were diagnosed with ASD based on external clinical evaluations.

Binary logistic regression was conducted to assess the predictive value of gender, race, areas of delay (i.e., social-emotional, cognitive, communication, physical, and adaptive), parent/provider autism concerns, and M-CHAT-R/F scores. A Receiver Operating Characteristic (ROC) analysis was performed to examine the ability of the M-CHAT-R/F to discriminate between ASD and non-ASD cases. The Area Under the Curve (AUC) and sensitivity and specificity values were analyzed across different threshold scores.

Results:

The final logistic regression model was statistically significant ($\chi^2=28.20$, $p=.013$), explaining between 22.3% (Cox & Snell R^2) and 39.8% (Nagelkerke R^2) of the variance in ASD diagnosis. The model correctly classified 90.2% of cases, with high sensitivity (99%) but lower specificity (37.5%). Communication delay was the strongest predictor of ASD diagnosis, with affected children being 79 times more likely to be diagnosed with ASD (OR=78.789, $p=.003$).

ROC analysis revealed an AUC of 0.591 (95% CI: 0.463-0.720, $p=.243$), indicating limited discriminatory capacity of the M-CHAT-R/F to differentiate between ASD and non-ASD cases in this sample. At the standard cutoff of 8, sensitivity was 66.7% and specificity was 50%. Lowering the cutoff to 5 increased sensitivity to 80.2%, but reduced specificity to 18.7%, leading to more false positives. Further reducing the threshold to 4 maximized sensitivity at 86.5%, but dropped specificity to 12.5%. Raising the cutoff to 9 decreased sensitivity to 62.5%, while maintaining specificity at 50%. At a cutoff of 10, sensitivity fell to 51%, while specificity increased to 56%, potentially missing nearly half of ASD cases.

Conclusions:

In early intervention contexts, where sensitivity is prioritized to ensure that more children receive appropriate support, lowering the M-CHAT-R/F threshold may be beneficial. While this would increase false positives, follow-up assessments can help clarify diagnosis over time. Lowering the threshold to 5 from 8 may strike the best balance in this population, improving sensitivity and ensuring that more children with ASD are identified early, allowing for timely access to interventions. The low number of true negatives in this sample may limit the specificity of these analyses, further emphasizing the need to focus on sensitivity to reduce the under-identification of children in need of ASD-specific intervention.

403.177 Accommodation of Rrbs Among Young Autistic Children: A Cross-Sectional and Longitudinal Study

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Background: Family accommodation consists of changes in behavior or routines made by family members of children with psychological or developmental conditions in an attempt to reduce the child's stress associated with the condition (Lebowitz, Panza, Su, & Bloch, 2012). Among children with anxiety disorders, studies have linked increased accommodation with higher symptom severity, lower psychosocial functioning, poorer response to intervention, increased parental distress, and elevated caregiver burden (Caporino et al., 2012; Lebowitz et al., 2012; Futh, Simonds, & Micali, 2012). Preliminary studies of family accommodation in the context of autism found a strong positive correlation between accommodation and restricted and repetitive behavior (RRBs) severity, anxiety levels, and disruptive behaviors, and a negative correlation between accommodation and adaptive functioning (Feldman et al., 2019; Koller et al., 2021; Matz Vaisman & Koller, under review). The current study focuses on accommodation among parents and teachers of young autistic children, both cross-sectionally and longitudinally, and the association between accommodation and various child clinical characteristics.

Objectives: To examine the role of accommodation of RRBs in young autistic children, across timepoints and caregivers, and to better understand its relationship with daily functioning.

Methods: 87 families of autistic children aged 2-4 who received a gold-standard autism evaluation participated in this study. Parents completed questionnaires on their child's RRB expression (RBS-R; Bodfish et al., 1999), their accommodation of the child's RRBs (FAS-RRB; Feldman et al., 2019), and child adaptive functioning (ABAS; Harrison & Oakland, 2015). Teachers completed a measure of their accommodation of the child's RRBs (TAS-RRB). Families completed the same questionnaires 6 and 12 months after the initial evaluation. Approximately one year after the initial assessment, families returned to the lab for a follow-up diagnostic evaluation.

Results: Analyses showed that, at diagnosis, over 75% of mothers, fathers, and teachers reported daily or weekly accommodation. Maternal accommodation correlated significantly and positively with child's RRBs ($r(85) = .487, p < .001$) and negatively with child adaptive functioning ($r(87) = -.253, p < .05$). Paternal accommodation correlated significantly and positively with child's RRBs ($r(76) = .313, p < .01$) but showed no significant correlation with child adaptive functioning. Maternal and paternal accommodation correlated significantly with each other ($r(77) = .369, p < .001$). Teacher accommodation did not correlate with any child characteristics, nor with parental accommodation. Analysis of the one-year follow-up data found that parents reported slightly less frequency of daily and weekly accommodation (69% mothers, 70% fathers), though their average accommodation scores were higher overall. Parents continued to correlate significantly with each other ($r(47) = .572, p < .01$). Teacher data were not analyzed at follow-up, as many of the children had transferred to a different educational framework over the course of the year.

Conclusions: This study shines light on accommodation in early childhood development of autistic children across caregivers and timepoints.

Accommodation should be further investigated with a more nuanced perspective on RRBs, distinguishing between accommodation of adaptive and maladaptive RRBs. Particular attention should be paid to trajectory analyses, to better understand the impact of time on accommodation.

403.178 Administering the CSBS in Collaboration with Caregivers in a Virtual Environment: Reliability, Fidelity, and Lessons Learned

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Background:

The Communication and Symbolic Behavior Scales Assessment (CSBS) has been shown to be valid and reliable (Wetherby et al. 2018) but is yet to be studied in telepractice. This study critically examines the coached-caregiver administration of the CSBS in a virtual environment. While parent-mediated interventions have been found effective in both in-person and telepractice (Hao et al, 2019), less is known about Parent-Mediated Assessment.

Objectives:

This study aimed to expand the scope of teleassessment with infants and toddler siblings of autistic children using the Communication and Symbolic Behavior Scales Assessment (i.e., CSBS; Wetherby & Prizant, 2002), which focuses on social communication in children ages 1-3. This study examined the following research questions: (1) Can caregivers administer the CSBS with virtual coaching with high rates of fidelity? (2) Can our assessors administer the CSBS virtually with high rates of fidelity? (3) Can naïve assessors achieve high levels of reliability when scoring the CSBS administered virtually? (4) Are the virtual assessment procedures, as designed, acceptable to families?

Methods:

We included participants from an ongoing clinical trial (NCT05307094). Caregivers with an older child diagnosed with autism and a younger, undiagnosed, toddler 11- 18 months of age were identified and recruited. A sample of thirty infant/toddler participants were randomly selected and of the ninety total CSBS administrations in this sample, three per participant across three timepoints, 20% were selected for reliability and fidelity. We included administration logistics regarding assessment material assembly and organization, procedures for modifications as well as characteristics and training of the assessors in this study.

Results:

Parent administration of the CSBS assessment procedures were consistently rated high ($M=95.61\%$, $SD=3.99$, range=85.94-100%) and agreement between raters on parent fidelity scores were strong ($ICC=0.89$). Assessor implementation of the CSBS protocol was high ($M=91.14\%$, $SD=8.8\%$, Range= 65.94%-100%). Two assessments scored below optimal fidelity levels (65.94% and 74.13%) were noted to be impacted by sibling(s) present, caregiver frustrated during assessment or assessment required multiple accommodations. Agreement between the raters of total social communication scores obtained from the telehealth CSBS was high ($ICC=.85$). There was notable variability ($CI= 0.64-0.94$) with camera/audio issues or confusion when protocol was not followed correctly by caregiver occurring more frequently. Results indicate that administering the CSBS in a telehealth environment is feasible for the clinician/parent to administer, reliable for the raters to score, and acceptable by parents. However, this type of administration may not be well-suited for all children.

Conclusions:

Future recommendations highlighting some technology and logistical demands as well as methods to adapt existing assessments for telehealth administration should be considered. Conducting CSBS assessment administrations with coaching via telehealth then comparing those administrations to others conducted via in-person clinical setting, could help researchers validate the accuracy of the tool, the nuance in coaching vs clinical judgement and how that translates across these contexts. Additionally, examining the moderators of these two contexts – the telehealth coaching model and the in-person administration model, could yield interesting results that may speak to some of the limitations we were unable to address.



403.179 Analyzing the Predictive Relationship of Early Motor Skills and Restricted and Repetitive Behaviors in Infancy

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Background: Restricted and repetitive behaviors (RRBs) are a core feature of autism spectrum disorder (ASD) and can include repetitive motor mannerisms that involve fine (hand/finger mannerisms/posturing) and gross motor (complex mannerisms; spinning, rocking, etc.) behaviors (Kim & Lord, 2010). In addition to RRBs, previous studies have found children with ASD to have co-occurring motor delays (Licari et al., 2019; Uljarević et al., 2017). Given motoric involvement in RRBs, it is possible that emerging RRBs and motor development are linked, and development in one area may affect or cascade into other domains (Bradshaw et al., 2022). It is possible that higher rates of RRBs, reflecting atypical motor movements, may emerge due to early motor difficulties. However, there is currently limited research on this association.

Objectives: The current study aims to identify the predictive relationship between early fine and gross motor skills in early infancy and later presentation of RRBs at age 2 years within infants at elevated (EL) and low (LL) genetic likelihood for ASD who were and were not diagnosed with ASD.

Methods: In a prospective, longitudinal study, infants ($N=61$; EL, $n=24$; LL, $n=37$) were seen in early infancy (between 4-6 months) and at outcome (2 years). Fine motor (FM) and gross motor (GM) skills were assessed using the Bayley-3 (Bayley, 2005) between 4-6 months. At 2 years, infants were seen for a diagnostic outcome visit. Selected RRB algorithm items from the ADOS-2 Toddler Module (Unusual Sensory Interest in Play Material/Person, Hand and Finger Movements/Posturing, and Unusually Repetitive Interests or Stereotyped Behaviors) were summed to generate our RRB outcome. General linear models were used to examine the relationship between infant motor skills and 2-year RRB scores across diagnostic outcome groups (ASD, $n=19$; TD, $n=42$).

Results: Overall, RRB scores at 2 years were higher for children with ASD than TD children ($F(1,57)=4.75$, $p=.001$). GM skills at 4-6m did not significantly predict RRB scores ($F(1,57)=0.38$, $p=.54$). However, FM skills did significantly predict RRB scores ($F(1,57)=5.94$, $p=.018$; see Figure 1.). Specifically for children with ASD, higher FM skills predicted higher RRB scores ($F(1,57)=4.80$, $p=.03$).

Conclusions: Contrary to our hypotheses, our findings indicate that more FM skills during infancy predicted higher RRB presentation later in development, especially for children with ASD. It is possible that infants with higher FM skills may have more opportunities to develop and engage in RRBs early in life that cascade to higher RRBs in toddlerhood. Additionally, we found no association between GM skills and later RRB presentation. Further research that characterizes RRBs more specifically may elucidate a relationship between early GM skills and later RRBs.



403.180 Test-Retest Reliability in Remote Assessment of Social Attention

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Background:

Infant siblings of autistic children have a higher likelihood of developing autism (Ozonoff et al., 2024). However, research with this population has been largely limited by in-person assessment, resulting in reduced accessibility and generalizability. The RISE battery is a set of originally lab-based tasks which have been adapted to investigate infant cognitive and language development at home (Tenenbaum et al., 2024). Prior research has shown that infants and toddlers later diagnosed with autism show a reduced preference for social stimuli when presented alongside non-social stimuli (Campbell et al., 2019; Chawarska et al., 2016; Pierce et al., 2016). Here we are testing a social-attention task in low-likelihood infants (those without an autistic sibling) to determine whether social preference can be measured reliably in a remote task.

Objectives:

1. To examine preference for social stimuli among infants viewing social and non-social stimuli remotely. Hypothesis: Low-likelihood infants will show a reliable preference for social stimuli.
2. To examine test-retest reliability between the first presentation of the task and the follow up presentation one week later. Hypothesis: Preference for social stimuli will be positively correlated between the first and second time point.

Methods:

A preferential looking task contrasting colorful geometric animations with dancing children was shown via a computer to 6- and 12-month-old infants using the remote administration platform Children Helping Science. There were 10, 4-second trials with location of the social and non-social stimuli counterbalanced across trials. Gaze direction was automatically coded by iCatcher+, an open-source computer vision program. The infants were shown the same task one week later. Only participants with >33% tracked frames and no side bias were included in the final analysis, which utilized a linear mixed-effects model and Spearman's correlation.

Results:

111 participants were tested (49% female, 51% male). 8.3% were reported as Asian, 1.8% as Black, 52.3% as White, and 37.6% as more than one race. 14.7% of participants reported being of Hispanic or Latino descent. 39 6-month-olds and 48 12-month-olds were included in the final analysis. A subset of 54 infants repeated the task at time 2, 41 of whom were included in the analysis.

Both 6- and 12-month-old participants showed a preference (mean proportion >0.50) for the social stimuli (12-m: 0.62 [0.56 - 0.68], $p = 0.001$; 6-m: 0.62 [0.56 - 0.68], $p = 0.001$; m-diff: 0.0 [-0.06 - 0.06], $p = 0.919$) (see Figure 1). Collapsing across age groups, there was a significant positive correlation between the proportion of looks to the social stimuli at the two time points, $r(41) = [0.34]$, $p = [0.032]$ (see Figure 2).

Conclusions:

Consistent with prior research (Pierce et al., 2011), infants showed a preference for the social relative to non-social stimuli through a remotely administered task. This remote assessment strategy provides a key opportunity to track individual differences in infant social attention, with potentially divergent developmental trajectories heralding early markers of autism in a scalable way. Currently data is being collected from infant siblings of autistic children to address group differences.

**403.181** Autism Indicators at 12-Months Predict Autism Screening Results at 24 Months in a General Population Birth Cohort

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Background: Measurement of behaviors and autism symptoms prior to 24 months of age has the potential to identify behavioral signs suitable for early surveillance in general pediatric populations.

Objectives: To test whether caregiver-reported autism indicators at 12 months predict autism related behaviors, positive autism screen results, and social communication delays at 24 months in a general population of infants, and to examine the impact of caregiver minority status on predictive associations.

Methods: Participants were 511 children (246 females; 336 White/Non-Hispanic) from an ongoing longitudinal birth cohort study. At age 12 months, primary caregivers completed the First Year Inventory-Lite (FYI-Lite, v3.1b), a measure of early emerging autism indicators, yielding two subscales, Social Communication (SC) and Sensory Regulatory (SR), and an overall score with predefined thresholds for elevated scores. The 24-months measures were the Communication and Symbolic Behavior Scales Infant Toddler Checklist (CSBS) and the Modified Checklist for Autism in Toddlers, Revised with Follow-Up (M-CHAT-R/F). Regression models tested the association between continuous scores from the 12- and 24-month measures. Contingency models, stratified by racial/ethnic minority status, tested the prediction of positive M-CHAT-R/F results from the presence of above threshold FYI-Lite score at 12 months. These analyses expand on previously presented findings, now with a larger sample using stratified relative risk analyses.

Results: Controlling for infant sex and minority status, regression models revealed that higher FYI-Lite subscale scores positively predicted later M-CHAT-R/F ($R^2 = 0.33$, $F[4,506] = 63.18$, $p < 0.001$) and CSBS ($R^2 = 0.39$, $F[4,506] = 81.17$, $p < 0.001$) scores. The FYI-Lite SC subscale was a statistically significant predictor in both models, predicting higher M-CHAT-R/F scores ($\beta_2 = 2.6$, $p < 0.001$) and poorer communication scores on the CSBS ($\beta_2 = -10.5$, $p < 0.001$) (see Figure 1). Male sex ($\beta_3 = -1.84$, $p < 0.001$) and minority status ($\beta_2 = -1.81$, $p < 0.01$) were associated with CSBS scores. Contingency analyses revealed that above threshold FYI-Lite scores at 12 months predicted positive M-CHAT-R/F results at 24 months ($RR = 9.1$; 95% CI: 4.53, 18.35). Stratification analyses revealed effect modification for minority status (Table 1): elevated FYI-Lite scores were more strongly predictive of positive M-CHAT-R/F scores in non-minority infants ($RR = 24.5$; 95% CI: 8.94, 67.1) than in minority infants ($RR = 2.9$; 95% CI: 1.02, 8.27). Thus, although proportionally more minority participants had elevated autism indicators at 12-months, this did not directly result in higher rates of positive M-CHAT-R/F scores in these participants. The cell sizes for categorical CSBS results were too small to calculate relative risk.

Conclusions: In these updated results from an ongoing longitudinal birth cohort study, individual differences in autism-related social communication behaviors at 12 months of age predicted autism-related behaviors at 24 months. The association between above threshold elevations on the FYI-Lite at 12 months and positive screen results at 24 months supports the plausibility of screening for autism indicators prior to the age of formal diagnosis. Effect modification was found, indicating the need to account for demographic diversity in future predictive models.



403.182 Autism Symptoms More Closely Associated with Object Engaged Play Than Language Skills in Toddlers with Autism

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Background: Joint engagement, where children share focus and interact with others, is crucial for language development (Roemer et al., 2022); however, toddlers with autism may have challenges with initiating and sustaining joint engagement (Shire et al., 2020). Research shows that toddlers with autism may spend more time in object-focused engagement more than in joint engagement. Longer periods of joint engagement have been associated with greater language learning in children with autism (Adamson et al; Kasari et al, 2008).

Objectives: To explore the relationship between toddler characteristics (including language abilities and autism symptoms) and engagement states during a play interaction between a caregiver and toddler with ASD.

Methods: This study is a secondary data analysis including 149 participants (M age= 21 months) with autism from two larger randomized control trials. At the start of the intervention, engagement states were coded during a 10-minute free play session between caregivers and their child.

Engagement was categorized into states, including (1) unengaged (e.g., wandering, looking around), (2) onlooking, (3) person engaged, (4) object engaged (OB) (e.g., intensely looking at or manipulating physical object), (5) supported jointly engaged, and (6) coordinated jointly engaged.

Bivariate correlations were conducted to explore the relationship between child demographic information, including language ability (from independent Mullen assessment) and autism symptoms (ADOS SC and RRB scores) and engagement states from caregiver-child interactions.

Results: The proportion of time spent in each engagement state was calculated (see Table 1). Toddlers, on average, spent the majority of the interaction in an object engaged state ($M=.50$, $SD=.23$). The proportion of time spent in OB focused engagement significantly related to ADOS Social communication scores (.184, $p=.025$) and ADOS RRB scores (.174, $p=.035$). Time spent in OB engagement did not relate to a child's language abilities (expressive: $-.082$, $p = .323$; receptive: $-.096$, $p=.246$). Children who spent more time OB engaged were more likely to have higher ADOS SC and RRB scores (greater symptoms).

Conclusions: The results indicate that ADOS symptoms, but not language, significantly relate to time spent object engaged. More autism symptoms were associated with more time in object engaged states. Object engaged states may limit language learning because the focus is on objects only and not people and objects. Future work is needed to explore the extent to which a primary focus on objects facilitates some skills but not others among young autistic children, and how targeted interventions can benefit both joint engagement and language learning.



403.183 Autism and Female Toddlers: Uncovering Subtle Differences in Social Affect and Self-Help

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Background: Compared to males diagnosed with Autism Spectrum Disorder (ASD), females are more likely to be misdiagnosed, late-diagnosed, or undiagnosed. Thus, differences are expected and often attributed to cognitive and social development discrepancies between sexes. However, existing research remains inconclusive. Better understanding of predictive autism traits in young females can lead to better screening, diagnosis, and targeted early interventions to improve long-term successful outcomes.

Objectives: To explore sex differences in early autism trait presentation of very young toddlers with a high likelihood for diagnosis, to improve the understanding and identification of the female autism phenotype.

Methods: Data was part of a larger study piloted by the Emory Autism Center and the Georgia Department of Public Health to increase capacity for early diagnosis via outreach in mostly rural and micropolitan public health regions. All data was from toddlers aged 16-33 months who were enrolled in early intervention in Georgia. Those who screened as “High-Risk” on the Modified Checklist for Autism in Toddlers – Revised with Follow-Up (MCHAT-R/F) were referred for a telehealth assessment completed with standardized methodology. The impact of biological sex on trait presentation was examined via analysis of scores from the MCHAT-R/F and Developmental Profile 4 (DP-4), items from the standard intake and developmental history form, and final diagnostic outcomes. All analyses were completed through IBM SPSS Statistics Version 29.0.2.0. (20).

Results: Participants ($N = 163$) had an average age of 25.3 months ($SD = 4.2$) at referral. Females represented approximately one-third of the sample (107 male, 56 female). The sample was 40.5% White, 52.8% Black or African American, 2.5% Asian, and 4.3% More Than One Race. Significant differences between sexes for outcome variables included area of initial caregiver concern, with behavioral and motor concerns significantly over-represented in males ($p < .05$) while females had a significantly higher likelihood of having self-help and social skills concerns ($p < .05$). Additionally, females were reported by caregivers as significantly less likely to smile and laugh and less likely to have concern for others ($p < .05$). Caregivers also significantly reported males were more interested in learning new things, and clinicians reported males were more likely to meet B3 criteria of fixated interests ($p < .05$). No significant differences were found regarding demographic variables, M-CHAT-R/F or DP-4 scores, or other diagnostic outcomes.

Conclusions: Males were more likely to have observable and problematic initial concerns like behavioral and motor issues and intense interests. Contrastingly, females were more likely to show more subtle concerns with general social and self-help skills, as well as less obvious atypical social behaviors like minimal smiling or concern for others. Broad cognitive and social measures did not pick up on these smaller differences, which may suggest additional screening/assessment questions needed for females in the larger population. Significant differences in autism presentation between sexes are present but may easily go undetected. Further investigation of these subtle differences, especially in moderate-risk groups, are paramount for understanding autism in females to ensure early identification and maximize opportunities for success.

403.184 Capturing Emotion Dysregulation in Early Childhood: Exploring Associations between Parent-Report and Observational Measures in Autistic and Non-Autistic Preschoolers

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Background: Emotion dysregulation (ED) is more prevalent and severe in autistic children compared to non-autistic peers. Typically, ED is measured through either parent reports or observational methods (i.e., emotion-evoking tasks) during which behavior and/or physiological measures are captured. However, findings from these different measurement approaches do not always align, potentially reflecting different facets of ED. Furthermore, given social and communication differences in autism the relationship between these measurement methods may differ for autistic children compared to their peers.

Objectives: This study aimed to 1) analyze the associations between three different methods of ED measurement (parent report, examiner-rated parent interview, observed affect during frustration tasks) in autistic and non-autistic preschoolers and 2) identify subgroups of preschoolers who showed similar patterns of association across the three measures.

Methods: The sample consisted of 57 3- and 4-year-olds (24 autistic; 33 non-autistic; mean age: 4.15 ± 0.52). Parents completed the Emotion Dysregulation Inventory-Young Child (EDI-YC), a parent report measure characterizing ED across two dimensions: reactivity (fast, intense emotional reactions) and dysphoria (low positive affect, sadness). Parents were interviewed using the Early Childhood Irritability-Related Impairment Interview (E-CRI) and scored by the interviewer on impairment associated with child ED across five contexts: home life, out-and-about, with peers, with nonparental adults, and in school/daycare. Finally, parents and children were observed at home during a series of frustration tasks and child negative affect presence and intensity were coded in five second intervals.

We examined bivariate correlations between all measures within the autistic and non-autistic samples separately. We utilized a machine learning clustering technique (Random Forests) to identify subgroups of preschoolers who exhibited similar characteristics across the three measures.

Results: Figure 1 presents the correlation coefficients between observed dysregulation and parent reported dysregulation (EDI and E-CRI) for both the autistic and non-autistic groups. In the autistic group, there were stronger associations observed between parent reports and observational measures across several pairs. The machine learning analysis revealed three ED subgroups. One displaying high levels of ED across all measures (high ED group), one displaying low levels of ED across all measures (low ED group), and one displaying low levels of ED across parent report variables but moderate levels of *observed* dysregulation (mixed ED). Figure 1 shows the percent of the autistic and non-autistic samples within each of these ED subgroups. Notably, 42% of the non-autistic sample was in the “mixed ED” group, while only 2 autistic children were in this group.

Conclusions: These findings highlight differences in the relationship between parent-reported measures of emotion dysregulation and observational measures in autistic and non-autistic children. Notably, parent report and observational measures converged more strongly in autistic children than non-autistic peers. Such differences may stem from variations in parent interpretation of behavior and/or the diverse ways child ED manifests across different contexts. Understanding these differences is essential for future research aimed at characterizing ED in autism. The final presentation will incorporate a larger sample size (100 expected participants) and the addition of physiological data from the observational tasks to further understand these associations.



403.186 Comparison of Multiple Autism Screeners, Used Individually and in Combination, at 18 and 24 Months of Age

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Background: Autism screening tools can aid in early detection of autism. Most screening studies are challenged to calculate psychometric indices of sensitivity and specificity because they typically assess only screen-positive cases and do not follow screen-negatives, thus not identifying missed cases of autism (Levy et al., 2020; McPheeters et al., 2016; Siu et al., 2016). We addressed this limitation of prior research in our study by using multiple screening measures, conducting repeat screenings, evaluating a random sample of approximately 10% of screen-negatives, and conducting surveillance at study conclusion.

Objectives: To examine psychometric properties of three autism screeners, when used independently and in combination, in a large community sample at 18 and 24 months, ages of common pediatric screening.

Methods: 838 families completed three screening measures online at 18 and 24 months of age: Video-referenced Infant Rating System for Autism (VIRSA; video-based measure in which caregivers rate which video clips depicting varying social-communication ability are most like their child, with no written descriptions of behavior), Infant-Toddler Checklist (ITC; written questionnaire in which caregivers rate social-communicative behaviors), and Modified Checklist for Autism in Toddlers-Revised (M-CHAT-R; written questionnaire in which caregivers answer 20 yes/no questions about autism-relevant behaviors). Screening positive was defined for each measure: VIRSA score ≤ 3 (Young et al., 2020), ITC composite score below 10th percentile (Wetherby & Prizant, 2002), and M-CHAT-R score ≥ 3 (Robins et al., 2014). Outcomes (ASD or no ASD) were determined at 36 months via telehealth diagnostic evaluation (including TELE-ASD-PEDS and Developmental Profile) for children who screened positive on any measure at any age and a random sample of children who screened negative on all screeners at every age. 86 (10%; 1 from screen-negative group) were classified with ASD at 36-month outcome.

Results: Sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV) for each screener when used in isolation at both ages are presented in Table 1. As can be seen from True Positives identified by each measure, our multi-screener approach identified cases that would have been screen-negatives if using only one screener. Logistic regressions to examine the unique predictive value of each measure (see Table 2) indicated that all three screeners were uniquely predictive at each age. We then examined sensitivity, specificity, PPV, and NPV at both ages for combinations of screeners (i.e., screening positive on 2 or 3 screeners), presented in Table 1.

Conclusions: Our study allowed for the calculation of all psychometric performance characteristics (not only PPV and NPV, but also sensitivity and specificity) through the use of multiple autism screeners and diagnostic follow-up on screen-negative cases, addressing limitations of previous work. Each screener provided non-redundant information at each age and identified true positive cases that were not detected by the other screeners. Our findings support the use of multiple screeners at the common ages of pediatric screening for autism, particularly the ITC and M-CHAT-R in combination.



403.187 Developing an Infant Reward Processing Scale from the Infant Behavior Questionnaire – Revised Short Form

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Background: The Social Motivation Hypothesis of autism posits that autistic individuals may be less likely than neurotypical individuals to find social stimuli rewarding. Evidence suggests that school-age children, adolescents, and adults on the spectrum show diminished neural responses to rewarding social and nonsocial stimuli compared to neurotypical peers (Clements et al., 2018). Reward processing is commonly studied in school ages through adulthood, but rarely in infancy and toddlerhood, when reward circuitry begins developing and when autism becomes apparent. In this study, we explore a potential parent-report measure of reward processing for use during infancy. We leverage the commonly used Infant Behavior Questionnaire-Revised Short Form (IBQ-R-SF), a 91-item measure of infant temperament suitable for infants aged 3-12 months. Although some of the existing fourteen IBQ-R subscales tap aspects of reward processing, a subscale specific to reward processing does not yet exist. The derivation of a reward composite will facilitate collection of parent-report data to test the Social Motivation Hypothesis in the first year of life.

Objectives: To develop a reward composite scale from the IBQ-R-SF.

Methods: The IBQ-R-SF was reviewed by three authors to identify items that might comprise three novel subscales relevant to reward processing (effort, response, anticipation), mirroring methods of similar efforts (Irwin et al., 2024; Marrus et al., 2022). IBQ-R-SF data collected at Boston Children's Hospital were factor analyzed in a discovery sample of 692 infants (ages 5-12 months) and in an independent replication sample of n=173 9-month-olds. Exploratory factor, confirmatory factor, and reliability analyses were performed iteratively. Items with the lowest factor loadings and item-total correlations were pruned until goodness-of-fit indices reached acceptable levels in the discovery sample and all primary factor loadings exceeded 0.25.

Results: Of the 91 IBQ-R-SF items, 29 items were selected by two or more raters for inclusion in the reward processing composite. After pruning, 18 items remained. An exploratory factor analysis showed a three-factor solution as the best fit in the discovery sample. Fit indices in confirmatory factor analysis suggested adequate fit in the discovery sample (RMSEA=0.094, SRMR=0.071, CFI=0.709) and the replication sample (RMSEA=0.10, SRMR=0.069, CFI=0.827). Across samples, loadings ranged from 0.167-0.921. Although goodness-of-fit indices for these novel reward composite scales did not reach desired thresholds (RMSEA <0.05, CFI>0.90, SRMR<0.05), the standard IBQ-R-SF factor structure showed worse fit in both samples (discovery sample: RMSEA=0.073, SRMR=0.115, CFI=0.572; replication sample: RMSEA=0.115, SRMR=0.111, CFI=0.728), consistent with past efforts that failed to replicate the standard subscale structure (Gartstein et al., 2005; Bosquet Enlow et al., 2016). Items loading on the three reward composite factors appeared to tap constructs of approach, positive response to toys and books, and smile/laughter during physical play.

Conclusions: Three reward subscales were created from a subset of IBQ-R-SF items. These subscales may be used to track the development of reward-relevant behavior, informing the Social Motivation Hypothesis of autism. These novel subscales showed promising fit in two independent samples. Future directions include assessing construct validity, discriminant validity, and differences in reward composite scores for infants who do and do not develop autism.

403.188 Developmental Changes in the Remote Assessment of Prediction Abilities in Infants with and without a Sibling with Autism
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Background:

Previous research suggests a connection between autism and difficulties with prediction (Cannon et al., 2021; Sinha et al., 2014). Our understanding of the development of this critical skill in autism has been limited by the need for in-person assessment, which typically involves small samples. Examining developmental milestones such as prediction in large samples of infants, including those who will later receive an autism diagnosis, would help elucidate the relevance of these mechanisms for cognitive development in autism. The Remote Infant Studies on Early Learning (RISE) Battery was developed to address this need. Here, we present preliminary results from the RISE Prediction Task, which assesses anticipatory looks to cued spatial locations following familiarization. Previous research has shown correlations between this type of visual prediction and language abilities in toddlers without autism (Reuter et al., 2018).

Objectives:

1. To test a simplified version of a visual prediction task that can be administered in the infant's home for infants with and without an autistic sibling.
2. To test for developmental changes in visual prediction abilities during the first year of life.

Methods:

To date, 55 6-month-old infants and 56 12-month-old infants without an autistic sibling (49% female, 51% male; 8.3% Asian, 1.8% Black, 52.3% White, and 37.6% more than one race) have enrolled. We have also tested 35 infant siblings of autistic children (6 months, n = 23; 12 months, n = 12; target n = 100) for whom data analysis is underway. Infants view 16 trials on their home computer. In each trial, an animated central cue is displayed (2 sec), followed by a colorful animated pinwheel that appears on either the left or right side of the screen (2 sec). For Trials 1-8, the pinwheel appears on one side and for Trials 9-16, it appears on the opposite side (starting side counter-balanced between infants). The dependent measure is the proportion of trials with an anticipatory eye movement (AEM), defined as looks to the target side occurring 200 ms before the central cue disappears and up to 200 ms after the target appears.

Results:

In Block 1, 6-month-olds did not reliably demonstrate AEMs until Trial 7 (Fig 1). Twelve-month-olds did so starting at Trial 3 (Fig 2). In Block 2, 12-month-olds were able to update their predictions about the new location reliably by Trial 16, whereas 6-month-olds failed to do so on any trial.

Conclusions:

In the remote setting, we successfully measured infant abilities in the domain of visual prediction, objectively and in a scalable manner. We demonstrated a developmental shift between 6 and 12 months in the ability of infants to predict and update their predictions about a target location. This work has implications for our capacity to assess this important cognitive ability in large samples of infants and can help us track the trajectory of prediction in infants who will go on to receive an autism diagnosis.



403.189 Distinct Pathways to Anxiety: Early Behavioral Inhibition and Social Anxiety in Syndromic and Idiopathic Autism

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Background: Anxiety affects ~40-50% of individuals with autism spectrum disorder (ASD).¹ Fragile X syndrome (FXS), the most common single-gene cause of ASD (i.e., 2-6% of ASD cases),^{2,3} is highly co-occurring with anxiety disorders, with 77-86% meeting criteria (e.g., social anxiety).⁴ ASD cases linked to known genetic conditions, like FXS, are referred to as "syndromic ASD," while those without a known genetic cause are "idiopathic ASD." Behavioral inhibition (BI), a temperament trait marked by heightened reactivity to novelty,⁵ increases risk for anxiety symptoms in childhood.⁶ Prior research identified differences in BI in ASD; autistic toddlers exhibit a muted fear response compared to neurotypical (NT) children.⁷ Yet, little is known how BI relates to later anxiety symptoms in ASD and how fear responses differ between idiopathic and syndromic ASD.

Objectives: To investigate differences in BI and explore the relationship between early (36 months) BI in and later (60 months) social anxiety in toddlers with syndromic ASD (FXS+ASD), toddlers with idiopathic ASD, and NT toddlers.

Methods: Participants included 46 children with ASD (85% male), 26 FXS+ASD children (85% male) and 30 NT children (71% male). The clinical best estimate (CBE) procedure⁸⁻¹² confirmed ASD diagnosis. At 36 months ($M(SD)_{ASD} = 37.01(1.73)$; $M(SD)_{FXS+ASD} = 37.28(1.75)$; $M(SD)_{NT} = 36.78(1.20)$), the Stranger Task¹³ was administered. Bodily fear, facial fear, and escape behaviors were coded from video. Social anxiety symptoms were measured at 60 months ($M(SD)_{ASD} = 59.27(2.63)$; $M(SD)_{FXS+ASD} = 59.60(3.36)$; $M(SD)_{NT} = 59.67(2.17)$) using the social anxiety subscale raw score from the Preschool Anxiety Scale-Revised.¹⁴ Path analysis¹⁵ was conducted to investigate how being part of the ASD or FXS+ASD group relates to fear behaviors at 36 months. Additionally, the analysis explored how fear behaviors, group membership, and their interaction were associated with social anxiety symptoms at 60 months. For skewness, social anxiety scores were log-transformed.

Results: Preliminary analyses showed more escape behaviors were observed in the FXS+ASD group compared to the NT group ($\beta = 0.36, p = .012$; Figure 1). Significant interactions were found between facial fear and both the ASD ($\beta = -7.21, p = .001$) and FXS+ASD groups ($\beta = -5.91, p = .005$), indicating that the relationship between early facial fear and later social anxiety differed from the NT group (Figure 2). While higher facial fear predicted more social anxiety in NT children, this association was reversed in children with ASD or FXS+ASD.

Conclusions: Preliminary findings suggest children with FXS+ASD exhibit more BI, as reflected in higher levels of escape behavior. However, the relationship between early facial fear and later social anxiety observed in NT children was not present in children with ASD or FXS+ASD. These different associations underscore the need for tailored approaches in identifying anxiety in ASD. This study's novel use of CBE to confirm diagnosis of ASD in FXS moves beyond merely examining the spectrum of ASD symptoms in FXS, addressing nuanced ways in which anxiety, fear behaviors, and ASD may interact in idiopathic and syndromic ASD, providing valuable insights into these distinct developmental pathways.



403.190 Dysregulation Is a Predictor of Time Unengaged in Toddlers with Autism

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Background: Toddlers with autism often have challenges with joint attention and tend to have shorter durations of joint engagement compared to typically developing peers. Since joint engagement plays a key role in enhancing social communication skills (such as joint attention or language), it would be apparent that dysregulation in young toddlers may negatively affect their ability to engage with a play partner.

Objectives: This study aims to explore the relationship between dysregulation and joint engagement within the context of a free play interaction between toddlers with ASD and their caregivers.

Methods: Data were drawn from two larger randomized control trials including 149 infants/toddlers ($M \text{ age} = 21 \text{ months}$) with autism (see Table 1). At baseline of the intervention, dysregulation behaviors and engagement states were coded during a 10-minute free play caregiver-child interaction. Dysregulation behaviors were coded by (a) type and (b) proportion time (in seconds) dysregulated. Dysregulation behaviors include (a) negativity (b) physical venting (c) idiosyncratic behaviors (d) avoidance (e) distraction (f) verbal repetitive behaviors (g) self-soothing and (h) other-directed comfort seeking. Engagement is coded via states, which include (1) unengaged (e.g., wanders, looks around), (b) onlooking (c) person engaged (d) object engaged (e) supported jointly engaged and (f) coordinated jointly engaged. Proportion of time (in seconds) in the unengaged state is used for analysis.

Results: Total time dysregulated significantly and positively relates to time unengaged ($r(148) = .361, p < .001$), such that higher time dysregulated relates to higher time unengaged. A multiple regression analysis was conducted to examine if proportion of total time unengaged could be predicted by proportion time dysregulated, while controlling for child ADOS scores and nonverbal cognitive ability (NVDQ). The overall model was significant, $R^2 = .183, (F(4,143) = 8.013, p < .001)$. Proportion time dysregulated was the strongest predictor, $b = .454, t(143) = 4.275, p < .001$.

Conclusions: Results suggest that the duration of dysregulation is significantly related to time unengaged within the caregiver-child play interaction. While children can be engaged while also being dysregulated (they are not mutually exclusive), these results highlight that these toddlers are indeed *unengaged* while exhibiting dysregulation. Repercussions for less time spent jointly engaged has implications to other developmental outcomes, including social communication (Shih et al., 2021). Given that children with ASD are at risk for challenges with emotion regulation and have challenges with joint engagement, this work has implications for future intervention targets. This study has also implications for investigating the role of the caregiver within the interaction, specifically in terms of facilitating joint engagement and supporting the child's emotion regulation.



403.191 Early Developmental Pathways in Infants at Elevated Likelihood for Autism: Towards an Innovative Biomarker Approach to the Study of Social and Non-Social Audiovisual Processing

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Background: Autism is characterized by significant heterogeneity, with individual differences not only in the severity of core symptoms but also in cognitive, language, sensory, and behavioral domains, which follow distinct developmental trajectories. There is growing interest in identifying reliable behavioral and brain-based biomarkers that could serve as early detection tools for autism. Autistic individuals exhibit differences in integrating sensory information across multiple modalities, such as audiovisual (AV) integration, and they process social and non-social stimuli differently compared to neurotypical (NT) individuals. However, research exploring the potential interactions between sensory and social processing in early life is still limited, and no studies have investigated early social and sensory markers in infant siblings of autistic children (EL) using integrated experimental techniques.

Objectives: This study introduces a novel research protocol that integrates electroencephalography (EEG oscillations) and eye-tracking (pupillometry) to (1) characterize AV processing in social and non-social contexts in EL compared to NT toddlers and (2) examine the association between early developmental pathways of early social/non-social audiovisual integration and later clinical outcomes.

Methods: The study includes 34 EL toddlers and 31 NT toddlers, all recruited at 18 months, with follow-up assessments conducted at 24 months. At both time points, participants undergo a comprehensive experimental protocol that includes pupillometry and EEG measurements. The integrated EEG-eye-tracking task focuses on AV processing in both social and non-social conditions. Videos are presented in both synchronous and asynchronous modalities (with a 1000 ms audio delay), resulting in four conditions: SOC/SYNCH, SOC/ASYNCH, NONSOC/SYNCH, and NONSOC/ASYNCH.

Results: Preliminary results from pupillometry analysis using a general linear mixed (GLM) model revealed a significant interaction group X time-point ($F=3.434$; $p<.05$). EL toddlers exhibited smaller pupil dilation in response to social stimuli compared to NT toddlers at both 18 and 24 months, with a significant reduction in pupil size from 18 to 24 months in the EL group (Figure 1a). Notably, only EL toddlers with clinical signs of autism (ELAUT+) had significantly smaller pupil size changes at 24 months compared to both NT toddlers and EL toddlers without clinical signs of autism (ELAUT-; $F=4.170$, $p=.020$; see Figure 1b). Furthermore, preliminary EEG findings showed that ELAUT+ toddlers exhibited lower EEG power in the theta band (frontal regions) in response to social stimuli compared to ELAUT- toddlers ($F=2.483$; $p=.036$; see Figure 2a,b).

Conclusions: These results underscore the importance of integrating sensory and social processing measures in early assessments, as they may provide valuable insights into the developmental trajectories of children at EL of autism. Further research is needed to confirm these findings and explore their potential for early diagnosis and individualized supports.



403.192 Early Motor Indications for ASD Diagnosis during Infancy

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Background: Autism Spectrum Disorder (ASD) is marked by challenges in communication, social interaction, and repetitive behaviors. Many children with ASD also experience additional difficulties, including sensory processing and sleep issues. Prior research has linked ASD to fine motor (FM) deficits, predominantly in children over three years of age. Early assessment of FM skills, starting at one year, may reveal developmental delays associated with ASD.

Objectives: This study examines the relationship between FM difficulties prior to three years of age and the subsequent development of ASD. It aims to characterize FM deficits in children with ASD and compare these to those in children diagnosed with Global Developmental Delay (GDD), with the intention of identifying FM characteristics that may serve as early indicators of ASD.

Methods: We conducted a retrospective analysis of FM function using the Peabody Developmental Motor Scales, 2nd Edition (PDMS-2), which includes assessments for Grasping and Visual-Motor Integration (VMI). Data were gathered from the Sheba Medical Center from 2012 to 2023, employing MDCLONE software for data extraction and Python for statistical analysis.

Results: Over the study period, 9,700 children under 18 years visited the Child Development Center, with 3,590 diagnosed with ASD and 622 with GDD. Among these, 383 ASD and 345 GDD children were evaluated using the PDMS-2 before age three. Fine motor delays (≤ 16 th percentile on PDMS-2) were identified in 60% of the ASD group and 52% of the GDD group. Notably, children with ASD were assessed at an older age than those with GDD (21 months vs. 14 months, $p<0.05$). The average percentile for both groups was 7%. A significant difference was observed in VMI scores: children with ASD averaged 7.2% compared to 12% in the GDD group ($p<0.05$). In the Grasping test, ASD children averaged 19%, while GDD children averaged 14% ($p<0.05$). Similar FM deficit patterns were noted with an 18-month age cut-off.

Conclusions: Our findings highlight a robust association between FM deficits and ASD, with children with ASD exhibiting significantly lower VMI scores compared to those with GDD, even before 18 months of age. Impaired VMI may serve as a critical early indicator for later ASD diagnosis, underscoring the need for early screening and intervention.

403.193 Effectiveness of Jasper Interventions in Community-Based Child Development Support Centers in Japan

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Background: JASPER (Joint Attention Symbolic Play Engagement and Regulation) is an intervention designed to improve "social communication," one of the core symptoms of Autism Spectrum Disorder (ASD). In Japan, government policies have led to the establishment of child development support centers within local communities for toddlers with developmental disorders. However, it is uncertain whether validated early intervention methods are being consistently implemented.

Objectives: This study aims to examine the effects of interventions based on the JASPER concept, implemented by multidisciplinary teams in child development support centers within local communities in Japan.

Methods:

[Participants] The study involved toddlers attending child development support centers that incorporated the JASPER concept in both Tokyo and other regional cities. There was one facility in Tokyo and two in other regions.

[Procedure] The intervention methods varied depending on the facility and the specific needs of the toddlers. Sessions typically consisted of one hour of individual instruction.

[Evaluation Measures] The Japanese version of the Vineland Adaptive Behavior Scales, Second Edition (Vineland-II), the New Edition of the K-Developmental Scale (which assesses developmental levels in three areas: postural-motor, cognitive-adaptive, and language-social, as well as overall development), and SPACE (Short Play and Communication Evaluation), a brief assessment used when setting short-term goals in JASPER, were used.

Results:

[Participants] The study included 27 toddlers (22 boys, 5 girls) attending community-based child development support centers. The average age of the children at the start of the intervention was 41 months (range: 19-72 months), and the average duration of attendance was 8 months (range: 4-19 months).

[Changes in Evaluation Measures] Paired t-tests were conducted on the scores of each domain and item in the Vineland-II, SPACE, and the K-Developmental Scale before and after the intervention, and Cohen's d was calculated for effect size. Significant improvements were observed in the following key indicators: In the Vineland-II Adaptive Behavior Scales, significant differences were found in the Socialization ($t(25)=3.59, p<.01, d=.69$) and Communication ($t(25)=2.85, p<.01, d=.55$) domains. Additionally, there were significant improvements in language and play levels. Furthermore, correlations between pre- and post-intervention differences in significant evaluation measures and the age at the start of the intervention were examined. A significant correlation was found between age at the start of intervention and the Communication domain of the Vineland-II ($r=-.48, p<.05$), responding to joint attention in SPACE ($r=-.70, p<.01$), 1-to-1 matching in SPACE ($r=-.51, p<.05$), and pre-symbolic play in SPACE ($r=-.47, p<.05$).

Conclusions: The results confirmed improvements in social interaction and language development, even when the intervention was carried out by staff other than psychologists. In fact, interventions based on the JASPER concept in community-based child development support centers showed improvements across a wide range of developmental areas in Japan. This suggests that frequent interventions within local communities, even by non-psychologists, may yield greater effects. Additionally, it was shown that the earlier the intervention starts, the greater the positive impact on improvements in communication and play levels.

403.194 Effects of Sleep on Motor Abilities of Infants with Higher and Lower Familial Likelihood of Autism in the First Year of Life

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Background: Sleep alterations can be evident as early as 6 to 12 months of age in infants who later develop autism spectrum disorder (ASD). Infants with a higher familial likelihood of developing ASD (HL) demonstrate longer sleep onset latency and increased nighttime awakenings. HL infants who are diagnosed with ASD also tend to show less advanced gross motor skills compared to typical infants between 6 and 24 months. Research suggests that daytime sleep (i.e., naps) influences motor learning in typically developing infants. Motor abilities represent an accrual of previous learning experiences (i.e., motor learning) and maturation. However, the effect of sleep alterations on motor abilities in HL infants is not well understood. Given the role of sleep in motor learning in the first year of life, understanding how sleep relates to motor abilities has the potential to identify mechanisms in the early development of autism and guide the timing and implementation of effective interventions. **Objectives:** We aim to examine the relationships between sleep and motor abilities in infants with higher familial likelihood (HL) and lower familial likelihood (LL) of developing ASD.

Methods: Participants were part of the ongoing, multi-site, Infant Brain Imaging Study (IBIS) replication cohort and Sleep Study. Sleep characteristics in 192 infants (HL 144; LL 48) at 6 months, 134 (HL 107; LL 27) at 12 months, and 104 (HL 81; LL 23) longitudinally at 6 and 12 months were evaluated using the parent-reported Brief Infant Sleep Questionnaire (BISQ; hours of night sleep, day sleep, sleep onset latency, night wakefulness). Motor abilities were assessed using two examiner-delivered, standardized measures: the Bayley Scales of Infant and Toddler Development (Bayley; Gross Motor/GM, Fine Motor/FM), and the Alberta Infant Motor Scale (AIMS; Total Score). Multiple regression analysis was used to assess if sleep is associated with motor abilities and whether this association differs between groups.

Results: At 6 months, there was a positive association between daytime sleep (hrs) and higher GM scores in LL (Total Score $r=0.39$; $p=.033$; GM $r=0.37$; $p=.008$) but not HL infants (Total Score $r=-0.03$; ns; GM $r=-0.02$; ns). AIMS Total Score was related to sleep at 6 months but the interaction term fell short of significance (see Table 1). We found no significant relationships between sleep and FM at any age, sleep and GM at 12 months, or sleep at 6 months and motor at 12 months.

Conclusions: We found partial, preliminary support for an association between daytime sleep and gross motor ability consistent with a previously established relationship between naps and motor learning in typically developing infants in the first year of life. As this is an ongoing longitudinal study, future research will include outcome diagnosis at 24 months of age which may shed further light on group differences. The sample size will continue to increase, and the trend-level Group by Daytime sleep associations observed here will be clarified. Future research is needed to provide insights into the influence of sleep on the developmental trajectories of motor abilities in infants.



403.196 Examining Early Language Development Among Infant Twin Pairs: Comparing Expressive and Receptive Language and Implications for Autism Diagnosis

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Background:

Early identification of communication delays can facilitate implementation of early intervention services, thereby significantly impacting a child's developmental trajectory while building foundational language and social-communication skills (Morgan, et al., 2020). Research on multiples has historically reported higher rates of language and speech delays when compared with singleton children, suggesting twins would benefit from early intervention when delays are noted (Thorpe, 2006, Rutter, et. al, 2003, McMahon & Dodd, 1997). There is a gap in research assessing longitudinal language development among infant twin pairs, inclusive of early gestational ages. This prospective study aims to address this gap by comparing direct assessment of early language development at 6 months to direct assessment at 18 months.

Objectives:

1. Evaluate the relationship between 6-month standardized expressive and receptive language scores to 18-month standardized expressive and receptive language scores considering gestational age and zygosity.
2. Evaluate 6-month to 18-month standardized language assessment in correlation with a later autism diagnosis.

Methods:

This study was conducted as part of an ongoing prospective longitudinal study on infant twins of all medical backgrounds. Preliminary data was collected from 15 twin sets (n=30 infants) who completed the Mullen Scales of Early Learning (MSEL; Mullen, 1995) at 6-month and 18-month time points and the parent-reported Goldsmith Child Zygosity Questionnaire (Goldsmith, 1991). Additionally twin pairs may receive further developmental testing, using the Autism Diagnostic Observation Schedule (ADOS-Toddler) and Vineland Adaptive Behavior Scales-3 to determine an autism diagnosis. Participants are reported as identical (n=10) and fraternal (n=20), with gestational age ranging between 27-38 weeks. Eight participants have received a confirmed diagnosis of ASD. Seven participants have received a diagnosis of language delay. ANOVA was used to analyze 6-month and 18-month standard scores for both MSEL expressive and receptive scales. Further examination was done in consideration of zygosity, gestational age, and diagnosis of ASD or language delay.

Results:

Linear regression models indicated that 6-month expressive language scores significantly predicted 18-month expressive language scores ($p=0.025$). However, models showed 6-month receptive did not significantly predict 18-month receptive language scores ($p=0.723$). Logistic regression models show ASD diagnoses were associated with lower 18m receptive scores ($p<0.001$) and lower 18m expressive scores ($p=0.003$). When included in our models, additional demographic predictors such as zygosity and gestational age, did not explain variance.

Conclusions:

Preliminary results indicate 6-month expressive scores predict 18-month expressive scores in twin sets assessed, while 6-month receptive scores do not predict 18-month receptive scores. Additionally, twins with ASD had lower expressive and receptive scores at 18-months than twins with language delay. Findings suggest that 6-month language assessment may provide clinical insight to the child's later language outcomes, and monitoring twins with language assessment as early as 6 months can improve later social-communication outcomes before 2 years. This aligns with language development research that shows expressive language as a strong predictor of later language outcomes. Based on current recruitment data, we expect 24 twin sets (n=48 infants) with complete assessment data by April 2025. Future analysis of these twin sets will continue to examine clinical implications of early assessment.

403.197 The Importance of a Multifaceted Longitudinal Examination of Anthropometric Measures in Studying the Association between Head Growth during Infancy and Risk of Autism Spectrum Disorder

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Background: Some studies have reported that abnormal head size during infancy is associated with autism spectrum disorder (ASD) including reports that children with ASD are born with a relatively small head circumference that normalizes within the first year of life. In addition, higher proportions of both macrocephaly and microcephaly have been consistently reported among children with ASD. However, the specific head growth trajectories during infancy associated with ASD and their relationship with the overall weight gain of these children remain inadequately explored.

Objectives: To investigate the associations of head growth trajectories during infancy and the subsequent likelihood of ASD.

Methods: We conducted a retrospective case-control study including 262 children diagnosed with ASD and 560 controls without ASD or any other developmental disorders that were matched by age, sex, and ethnicity. Growth measures at the ages of 1, 2, 4, 6, 9, and 12 months were obtained from government-funded mother-child health clinics in southern Israel that regularly monitor the growth and development of all children in this region. We divided the sample into seven clusters based on their head growth trajectories (**Figure 1**) and used conditional logistic regression models to assess the independent association of these clusters with ASD.

Results: The study sample comprised 78.2% males and 76.8% Jewish children. HC and weight were significantly correlated throughout the study period (Pearson Correlation $r = 0.45-0.59$, $p < 0.001$), and notably stronger in autism ($r = 0.55-0.69$) than in controls ($r = 0.36-0.55$). Children with small and large heads throughout infancy (**Figures 1 B&C**) had the highest likelihood of developing ASD compared to children with normal head size (**Figure 1A**) (adjusted odds ratio [aOR] = 3.761, 95%CI = 2.288-5.732; and aOR = 3.335, 95%CI = 2.001-6.255, respectively). Further stratification of these lower and upper quartiles revealed that the strongest associations with ASD were seen among children in the most extreme (0-5th and 95-100th) percentiles (aOR = 4.568, 95%CI = 1.991-8.877; aOR = 11.871, 95%CI = 2.765-55.467, respectively). Interestingly, the associations between head growth trajectories depicted in **Figures 1 B&C** and ASD, were mainly driven by children showing similar body weight trajectories (aOR = 6.232, 95%CI = 3.001-11.388; and aOR = 10.564, 95%CI = 3.878-28.543, respectively).

Conclusions: Our findings suggest that the reported associations between atypical head growth during infancy and ASD may be attributed to broader physical growth anomalies. This conclusion highlights the importance of a multifaceted longitudinal examination of such anthropometric measures in studies of child development.



403.198 Eye Tracking Prognosis

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Background:

Challenges in social attention are central to ASD diagnosis and can significantly affect a child's ability to form friendships, succeed in school, and excel in future employment. However, parents of newly diagnosed children often receive limited information about the severity of these challenges and future prospects. While the DSM-5 includes severity levels, they focus on support needs rather than social attention impairment. There is a need for tools that provide objective, quantitative information about social attention severity and its potential to predict short- and long-term outcomes.

Eye tracking (ET) offers an objective measure of social attention. Our previous research using various ET tests has shown that toddlers with extremely low social attention can be accurately diagnostically classified. Additionally, we identified an ASD subgroup with markedly low social attention, linked to more severe clinical symptoms at the time of testing. However, ET's ability to predict symptom severity over time remains less understood.

Objectives:

The goals of the present study are to:

- (1) Examine the power of ET collected during the toddler period (ages 12-48 months), to predict language, cognitive, adaptive and symptom severity across short term (i.e., 6-12 months), intermediate term (i.e., 12-24 months following eye tracking) and long term (i.e., > 2 years following eye tracking periods).
- (2) To compare the predictive power of eye tracking from a single test to the predictive power associated with multiple tests.

Methods:

Subjects: Toddlers participated in 1-5 different eye tracking tests. To examine Goal #1, we leveraged ET data from 640 toddlers with ASD who had at least 1 eye tracking test during the toddler period and follow up clinical testing during the short (181), intermediate (346) or long-term testing periods (113). To address Goal #2, we examined the predictive power of 579 toddlers with ASD who had either 2, 3, 4 or 5 eye tracking tests and compared predictive performance to just 1 test. For this analysis, the most extreme eye tracking value was used.

ET: Tobii T120 or Tobii Spectrum Pro 600Hz .

Statistical Analyses: The relationships between variables were examined using Pearson correlation for preliminary analysis, and multiple multivariate regression for the follow up analysis, wherein factors such as level of treatment engagement were included, and subtype stratifiers.

Results:

Preliminary analysis revealed significant correlations between the percentage of fixation on non-social stimuli and clinical outcomes across all follow-up periods (short, intermediate, and long-term). Specifically, higher fixation on non-social stimuli was associated with poorer scores on the ADOS, Mullen, and Vineland assessments ($p < 0.05$, $r > 0.3$). Additionally, a higher number of failed eye-tracking tests was linked to worse clinical outcomes ($p < 0.05$, $r > 0.3$).

Conclusions:

The consistent association between increased fixation on non-social stimuli and poorer clinical outcomes suggests that social attention deficits, as measured through ET, could be used to identify children at higher risk for cognitive, behavioral, and adaptive functioning in toddlers with ASD.



403.199 From Genes to Gaze: Examining Multisensory Attention and Genetic Risk for Autism in Infancy

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Background:

Recent research highlights *de novo* mutations in autism spectrum disorder (ASD), with individually rare single nucleotide variants or copy number variants collectively identified in 15-20% of individuals. In infancy, genetic risk for autism is associated with alterations in brain networks (Girault et al., 2022; Hazlett et al., 2017) that may impact audio-visual attention.

Objectives:

We examined eye gaze behaviors to determine whether audio-visual attention differs between infants at increased genetic risk (IGR) and not at genetic risk (NGR) for ASD.

Methods:

We extended a behavioral measure of audio-visual attention (Bahrick et al., 2018), where infants watched a series of social and non-social trials presented in high- and low-attention competition contexts while measuring eye movements (Fig.1). We examined three behaviors: 1) sustained attention to lateral events, 2) intersensory matching toward audio-visual synchrony, and 3) attentional disengagement from central to lateral stimuli. We analyzed a cohort of IGR ($n=7$ unique infants; $n=19$ cross-sectional datasets; $n=9$ female) and matched NGR infants ($n=5$ unique infants; $n=11$ cross-sectional datasets; $n=7$ female) assessed at 4, 6, 9, 12, and 15 months.

Results:

We conducted three linear mixed-effects models in R, controlling for age, sex, and number of usable trials, for each behavior across trials. In each model, within-subject fixed factors included trial type (social vs. non-social) and competition-type (high vs. low), and a between-subjects fixed factor of group (IGR vs. NGR). We then derived estimated marginal means and conducted pairwise comparisons, using package 'emmeans'. We plotted three-way interactions for each behavior (Fig.2). For sustained attention, there was no main effect of group ($p=.31$), nor any group-level interactions (all $p's > .69$). All infants had greater attention to social than non-social stimuli ($p=.002$), and to low- compared to high-competition trials ($p<.001$).

Regarding intersensory matching toward audio-visual synchrony, there was no effect of group ($p=.96$), nor any group-level interactions (all $p's > .62$). All infants had more accurate intersensory matching for non-social high-competition trials compared to social high-competition ($p=.02$) and non-social low-competition ($p=.02$).

For attentional disengagement, infants were more likely to disengage from low-competition compared to high-competition presentations ($p=.001$). We observed a non-significant three-way interaction between group, trial, and competition types ($p=.33$), and trending two-way interactions between trial-type and group ($p=.18$), and competition-type and group ($p=.18$). To examine these interactions, we conducted pairwise comparisons for each level of social and non-social trial types, accounting for the levels of competition-type and group. For non-social trial types, we found that IGR infants tend to disengage more slowly from central stimuli in high-competition contexts ($p=.14$), which was not observed during social trials ($p=1.0$).

Conclusions:

These results suggest differences between IGR and NGR infants, such that IGR infants showed slower disengagement rates from a central stimulus in non-social contexts compared to NGR infants. These preliminary results underscore the importance of examining attentional behaviors within social and non-social contexts, highlighting that distinctions arise in non-social contexts. Ongoing work will investigate whether differences in attention moderate emerging autistic symptomatology and will focus on increasing the sample size to strengthen these findings and draw more definitive conclusions.



403.201 Assessment of Synchrony in Parent-Child Interaction in Autism: A Systematic Review of Observational Tools.

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Background:

Synchrony, often described as a 'conversational dance' between parent and child (Stern, 1985), involves a dynamic process where both partners mutually influence each other's behaviours. This mutual responsiveness has been shown to play a crucial role in child development, impacting areas such as early socio-communicative skills, language acquisition, and emotional bonding in both neurotypical and autistic children (Northrup, 2015). Research on synchrony spans multiple domains, including neural (Cui, 2012), physiological (Meyer, 2020; Flory, 2023), and behavioural dimensions (Carnevali, 2024; Koul, 2023), highlighting its importance for understanding early developmental processes. The growing interest in this field underscores the importance of parent-child interactions, particularly in naturalistic settings, as key contexts for observing and identifying early socio-communicative trajectories associated with autism (Kallerman, 2020). Despite systematic reviews on parental behaviours in interactions with neurotypical and autistic children (Ku et al., 2019; Madarevic et al., 2020), there has been a lack of focus on the specific tools and methodologies used to measure synchrony in these interactions.

Objectives:

We aim to conduct a systematic review of the literature, comparing different observational methodologies used to analyse the construct of synchrony in parent-child interaction within the context of autism.

Methods:

A systematic literature review was conducted following PRISMA guidelines (PROSPERO registration code CRD42012002435), consulting the databases PubMed, Eric, PsycNet, and Web of Science. The initial search identified 898 articles, which were reduced to 139 after a blind screening of titles and abstracts by two researchers, and finally to 35 articles after full-text analysis. A quality appraisal was performed for these studies using tools developed by the Joanna Briggs Institute (Barker TH., 2023).

Results:

Data analysis highlighted significant variability in the methods used to observe synchrony, particularly in terms of setting, duration, and coding procedures. The majority of studies favoured naturalistic contexts, with a preference for microcoding methodologies. The children's mean age of the included studies was 24 months and the caregivers involved were almost exclusively mothers. Few studies considered the socio-demographic characteristics of the sample, and only a limited number examined the influence of other factors, such as the parent's psychological profile or the time parents spent with the child during daily routines as possible mediators.

Conclusions:

This systematic review underscores the important role of dyadic synchrony in parent-child interactions in autism. The variability in observational methodologies highlights a significant gap in the literature, suggesting the need for standardised approaches to better understand the dynamics of this 'conversational dance.' While the emphasis on naturalistic settings and microcoding reflects an effort to capture authentic interactions, the limited exploration of socio-demographic factors and parental influences points to an area that needs further investigation. By addressing these gaps, future research is warranted to enhance our understanding of how synchrony contributes to developmental outcomes in both neurotypical and autistic children, ultimately informing interventions and support strategies for families.

403.202 Exploring Dyadic Synchrony in Naturalistic Mother-Child Interactions: Differences between Autistic and Neurotypical Young Children

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Background:

Mother-child social interaction and dyadic synchrony are critical components of early development, influencing social, emotional, and communicative skills. Investigating the dynamics of interpersonal synchrony during naturalistic mother-child interactions in neurodivergent autistic children is essential for identifying specific patterns of reciprocal communication that may differ from those of neurotypical (NT) peers. Previous evidence indicates that children with autism spectrum conditions (ASC) exhibit reduced interpersonal synchrony across various domains, such as motor, conversational, physiological, and neural synchrony, compared to their NT counterparts (McNaughton KA, 2020). Atypical synchrony has also been proposed as a potential biomarker for early detection, stratification, and intervention response in ASC (Ward JA, 2018; Siller and Sigman, 2002; Zampella CJ, 2020).

Objectives:

Based on previous evidence, this study aims to investigate mother-child social and communicative synchrony during naturalistic play interactions in NT children and young ASC children.

Methods:

This preliminary sample includes 9 ASC children (4 males; mean age: 19.37 months, SD: 3.41) and 7 NT children (4 males; mean age: 27.24 months, SD: 3.31). The two groups were paired matched by the chronological age of the NT group with the developmental performance age of the ASC group. Videos of naturalistic mother-child play interactions were micro-analytically coded using the Revised Relational Coding System (Fogel, 1993, 2000, 2007) to analyse synchronous communicative exchanges. The non-parametric Mann-Whitney U test was applied to compare total duration of synchrony exchanges between the ASC and NT groups.

Results:

Preliminary analyses revealed significant differences in dyadic synchrony between the two groups. ASC dyads spent significantly less time engaged in synchronous sequential communicative exchanges compared to NT dyads ($z = 11$, $p = 0.03$).

Conclusions:

Our findings indicate that mother-child dyads involving ASC children engage in synchronous and sequential communicative exchanges for a shorter duration compared to NT dyads, showing specific difficulties in maintaining reciprocal social interactions during play. By gaining a deeper understanding of these dynamics, we can develop strategies to support parents in fostering effective communication, enhancing ASC children's engagement in synchronous activities, and ultimately promoting their social and emotional development.

Poster Session**404 - Epidemiology I**

May 1st, 2025, 12:30 PM - 1:30 PM - Hall 4A

404.204 An Investigation of Sexuality in Autistic and Non-Autistic Individuals across the Gender Spectrum

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Background: Evidence suggests that both gender diversity and sexuality diversity are particularly common in autistic populations (Bungert et al., 2024; Dewinter et al., 2024). Emerging evidence suggests that autism is proportionally overrepresented among LGBTQ individuals. For example, according to the Trevor Project (2022), 5% of LGBTQ youth surveyed reported an autism diagnosis, and 35% suspected they may be autistic. In general populations, gender diversity and sexuality diversity are often intersectional, and the intersection may be associated with different patterns of resilience (e.g., Walls et al., 2019). However, little is known about how gender diversity and sexuality diversity intersect among autistic individuals.

Objectives: This study aims to understand how patterns of sexuality may differ among autistic people across the gender spectrum. Specifically, we hypothesize that autistic individuals will demonstrate greater overall sexuality diversity compared to non-autistic individuals, and that this difference will be amplified among autistic gender-diverse individuals.

Methods: This study employs the standardization sample for the Gender Self-Report (n=1654; Strang et al., 2023), the first multi-dimensional gender characterization method validated in autistic and non-autistic youth and adults. The sample was carefully recruited across 7 separate national recruitments to equitably include gender-diverse people (n=725; n=320 autistic) and those with diverse sexualities (n=912; n=484 autistic), oversampling for autistic individuals. To be most inclusive, this study employs reports of sexual attraction for analyses, as some terms for sexual orientation identities are not universally understood. Participants were asked four questions regarding their sexual attraction (i.e., attraction to women, men, and/or nonbinary people, no attraction) and their answer(s) were grouped into four sexual attraction categories: multi-gender attraction, same-gender attraction, no sexual attraction, and attraction to nonbinary individuals. Four logistic regression analyses were conducted, one for each of the sexual attraction categories. Predictors in each model included gender diversity, autism diagnostic status, age, sex assigned at birth, and the interaction between gender diversity and autism status.

Results: The False Discovery Rate was employed for multiple comparisons. Omnibus tests were significant for all types of sexual attraction. The interaction term was significant in all models, save for attraction to nonbinary individuals ($p<.092$). Post hoc tests indicated that autism was associated with greater sexuality diversity among both cisgender and gender-diverse individuals. Cisgender autistic versus cisgender non-autistic individuals, and separately, gender-diverse autistic versus gender-diverse non-autistic individuals, were more likely to report attraction to multiple genders and attraction to nonbinary people ($p<.001$). However, same-gender attraction was less common in autistic versus non-autistic gender-diverse people ($p<.001$) and in gender-diverse autistic versus cisgender autistic participants ($p<.001$). Rates of no sexual attraction differed only between cisgender autistic and cisgender non-autistic participants ($p<.001$), with a higher proportion in the autistic group.

Conclusions: In partial support of our hypotheses, complex patterns of intersectional gender and sexuality diversity were identified. While autistic individuals reported greater multi-gender attraction and attraction to nonbinary individuals, same-gender attraction was less common among gender-diverse autistic individuals than gender-diverse non-autistic and cisgender autistic individuals. Future research should investigate profiles of resilience across intersectional genders and sexualities in autistic communities.

404.205 Association of Autism Spectrum Disorder and Common Co-Occurring Conditions with Suffocation

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Background: People with autism spectrum disorder (ASD) are at heightened risk of injury-related death and specific injuries, such as drowning and self-injury. As ASD prevalence rises, epidemiologic data describing specific injuries, such as suffocation, are essential for prevention efforts.

Objectives: Describe the excess risk of suffocation associated with ASD and common co-occurring diagnoses among people treated in United States (US) emergency departments (EDs).

Methods: Using a repeated cross-sectional study design, we analyzed data from the 2016-2020 Nationwide Emergency Department Sample (NEDS), the largest US all-payer ED visit claims database. Children ≥ 1 years and adults diagnosed with ASD and treated in EDs were identified using ICD-10-CM code F84.0. Intellectual disability (ID), attention-deficit/hyperactivity disorder (ADHD), and Alzheimer's disease and related dementia (ADRD) were similarly identified using relevant ICD-10-CM codes. ED visits for suffocation were identified using the ICD-10-CM external cause-of-injury matrix. Weighted multivariable logistic regression models were used to estimate the adjusted odds ratios (aOR) and 95% confidence intervals (CI) of suffocation-related ED visits in persons with and without ASD, ID, ADHD, and ADRD. Each model was adjusted for the other conditions, age, sex, urbanicity, and payor.

Results: The 2016-2021 NEDS recorded a weighted total of 803,777,608 ED visits, of which 1,012,210 (0.13%) were related to suffocation. Suffocation accounted for 0.35% of ED visits in patients with ASD, 0.67% of ED visits in patients with a diagnosis of ID, 0.07% of ED visits in patients with a diagnosis of ADHD, and 0.34% of ED visits in patients with a diagnosis of ADRD. Patients with ASD had a 75% increased odds of suffocation (aOR = 1.75; 95% CI: 1.65, 1.86), patients with ID a more than six-fold increased odds of suffocation (aOR = 6.56; 95% CI: 6.2, 6.94), patients with ADHD a 44% increased odds of suffocation (aOR = 1.44; 95% CI: 1.35, 1.53), and patients with ADRD a 106% increased odds of suffocation (aOR = 2.06; 95% CI: 2.01, 2.12). Across the lifespan suffocation accounted for a larger proportion of ED visits among patients with ASD than those without ASD.

Conclusions: Children and adults with ASD have an increased odds of ED-treated suffocation. ID, ADHD, and ADRD common co-occurring diagnoses with ASD across the lifespan, are also associated with increased odds of ED-treated suffocation. Further understanding of environmental circumstances and unique factors that may increase risk of suffocation in people with ASD is needed.



404.206 Associations between Exposure to per- and Polyfluoroalkyl Substances and the Risk of Autism Spectrum Disorder in Children

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Background: Autism spectrum disorder (ASD) is a neurodevelopmental disorder that occurs in early childhood. The etiology of ASD is unclear, with environmental factors contributing up to 50%. Per- and polyfluoroalkyl substances (PFAS) are a family of artificially synthesized chemicals that persist in the environment and are difficult to biodegrade, causing adverse effects on human health. With the global ban on legacy PFAS, emerging alternatives have been widely developed and applied. Limited attention has been paid to the effects of emerging PFAS alternatives on ASD risk.

Objectives: To investigate the associations of exposure to legacy and emerging PFAS with the risk of ASD in children based on a case-control study.

Methods: We included 201 ASD cases and 96 control children (average age: 5.4 years) from the Shanghai Autism Early Development (SAED) Cohort. Baseline information and plasma samples were collected at the enrollment. Levels of 33 legacy and emerging PFAS in plasma samples were measured using ultra-performance liquid chromatography-tandem mass spectrometry. A binary logistic regression model was used to calculate the adjusted odds ratio (aOR) and 95% confidence interval (95% CI) between PFAS levels and ASD risk. The joint effects of PFAS mixture on ASD risk were assessed by principal component analysis (PCA) and Bayesian kernel regression model (BKMR) models.

Results: 23 PFAS were identified in 50% of the children, with the highest level being PFOA (median 7.84 ng/mL), followed by PFOS (median 2.66 ng/mL). In single-chemical model, significant positive associations of four legacy PFAS [PFOA (aOR=1.52, 95% CI: 1.04-2.25), PFDA (aOR=1.29, 95% CI: 1.01-1.65), PFNA (aOR=1.49, 95% CI: 1.07-2.07), PFOS (aOR=2.23, 95% CI: 1.02-4.86)] and an emerging short-chain alternative [PFHxS (aOR=1.38, 95% CI: 1.08-1.78)] with increased ASD risk were observed. Mixture models showed that the joint effect of PFAS mixture on ASD was mainly driven by PFOA, PFNA, PFOS, and PFHxS.

Conclusions: Exposure to legacy and emerging PFAS during childhood may increase the risk of ASD.

404.207 Associations between Maternal Thyroid Dysfunction during Pregnancy and Autism Outcomes in the Marbles Prospective Cohort

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Background: Women of reproductive age are at risk for multiple types of thyroid dysfunction, including hypothyroidism (affecting 4% of pregnancies), hyperthyroidism (2.4% of pregnancies), and hypothyroxinemia (2% of pregnancies). The fetus receives maternal thyroid hormones throughout pregnancy, but is reliant on maternal thyroid hormones until around 18 weeks when the fetal thyroid starts to secrete hormones. Severe maternal hypothyroidism is a well-documented predictor of neurodevelopmental disability in children, but less is known about the relationship between maternal thyroid function and autism. Multiple population-based studies found a positive association between maternal hypothyroidism and child autism, but the relationship between hyperthyroidism and autism is less consistent. More studies are needed that use laboratory measures to assess thyroid dysfunction in all participating mothers and assess autism in all participating children to reduce misclassification bias.

Objectives: The objective is to examine associations between maternal thyroid dysfunction during pregnancy and child autism. We hypothesize that maternal thyroid dysfunction (in particular, hypothyroidism) will be associated with increased likelihood of autism.

Methods: Participants were from the Markers of Autism in Babies: Learning Early Signs (MARBLES) study, a prospective cohort that enrolls mothers in the Davis/Sacramento area who already have a biological child with autism spectrum disorder (ASD) and are planning another pregnancy. For this study, MARBLES mothers needed at least one pregnancy blood sample for the enrolled child and the child must have had an ASD assessment. Thyroid function (thyroid stimulating hormone, TSH, and free thyroxine, FT4) and thyroid autoantibodies (thyroid peroxidase, TPO and thyroglobulin, Tg) were measured in up to one blood sample per trimester per pregnancy. Normal thyroid function was defined using a TPO and TG negative subsample of mothers who reported no thyroid conditions in a study questionnaire. For most children, ASD was assessed by study clinicians using the autism diagnostic observation schedule. A small number of children were assessed using other assessments because of COVID-19 pandemic precautions. Multinomial regression was used to examine the associations between maternal thyroid dysfunction during pregnancy and developmental outcomes (ASD or non-typical development that was not ASD [non-TD] compared to typically developing).

Results: 281 pregnancies from 269 mothers met inclusion criteria. 28.11% of children were diagnosed with ASD (25 females, 54 males) and 14.59% were non-TD (18 females, 23 males). The proportion of children with ASD varied depending on maternal thyroid status (Table 1). Maternal hypothyroidism during pregnancy was associated with an increased likelihood of ASD (AOR 3.802, 95% CI 1.431-10.102) and non-TD (AOR 5.604, 95% CI 1.773-17.718) compared to typical development after controlling for thyroid antibodies, number of blood draws, maternal age, and child birth year. There was no association between hyperthyroidism and either outcome (Table 2).

Conclusions: Minimally-adjusted models supported a positive association between maternal hypothyroidism, though not hyperthyroidism, for ASD and non-TD. Maternal hypothyroidism may have a shared effect on autism and other developmental conditions. Additional planned analyses include examining TSH and FT4 as continuous predictors, examining autistic traits as an outcome, sex stratified analysis, trimester stratified analysis, and further adjustment for demographic characteristics.



404.208 Autism Spectrum Disorder (ASD) Prevalence in Somali Children in Minnesota: Data from the MN-ADDM Study

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Background: Minnesota has the largest population of Somali immigrants in the U.S with an estimated 57,000 people. We have been tracking prevalence of autism in Somali children in Minnesota since 2010 in response to community concerns that Somali children had higher rates of autism and a form of autism with greater support needs than other children. Previous prevalence estimates have not yet detected higher prevalence of autism for Somali 8-year-old children, but higher prevalence among Somali 4-year-olds began to emerge in 2018. Rates of co-occurring intellectual disability (ID) varied, with some study years showing higher rates of autism with ID in Somali children and some showing no differences. Small sample sizes have limited interpretability of these results.

Objectives: We will compare autism prevalence in 4- and 8-year-olds across racial/ethnic groups using data from the Minnesota site of the CDC's Autism and Developmental Disabilities Monitoring Network (MNADDM), surveillance year 2020, with a focus on Somali children.

Methods: Prevalence calculations utilize standardized ADDM methods involving systematic review of health and special education records of 4- and 8-year-old children within our defined surveillance area, which includes three large urban counties that house four of the five largest school districts in Minnesota. Population denominators are from the National Center for Health Statistics' bridged-race postcensal population estimates using the most recent vintage available at the conclusion of each study year and adjusted to include only children living in the surveillance area. A child is classified as Somali based on reported home language in education and/or health records. Prevalence estimates from surveillance year 2020 were compared across racial/ethnic groups assuming a Poisson distribution. Chi squared and Fisher's exact tests were used to identify differences between populations.

Results: For 2020, overall prevalence rates in 8-year-old children in MN revealed one in 34 children were estimated to have ASD. ASD prevalence for Somali 8-year-olds was one in 25 children and not statistically different from that of children in other race categories. Somali 4-year-old children had a significantly *higher* prevalence of ASD compared to 4-year-olds in other races. When compared to 4-year-old White children, Somali 4-year-olds had 3.43x the prevalence of autism. For both 4- and 8-year-olds, Somali autistic children had higher rates of co-occurring ID than White children. Sample sizes were small, and 95% CIs were broad but did not overlap in these comparisons.

Conclusions: The data reveals higher ASD prevalence rates in our 4-year-old Somali population compared to other racial groups, but this pattern was not found among 8-year-old children. It is possible that early detection of autism among Somali children has increased in the past few years resulting in increased identification by age 4, and subsequent years may show increased prevalence at age 8 as well. Somali children at both ages had higher rates of ID than other groups. Differences in rates of ID by racial/ethnic group may suggest barriers to early intervention or underidentification of autism without ID. Additional research is needed to understand these disparities and inform public health efforts and culturally appropriate practices.

404.209 Autism and Gender Variance Co-Occurrence Rates: A Preliminary Survey Analysis

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Background: Recent research has shown an overrepresentation of gender variance (GV) among autistic individuals when studies were conducted at autism clinics, gender clinics, and through broad data collections. However, no papers at the time of this study have been published that investigated the number of GV individuals seeking an autism diagnosis or directly surveyed diagnosticians to gather estimates of how many GV individuals they are assessing and diagnosing with autism.

Objectives: To investigate the number of GV individuals seeking and/or receiving an autism diagnosis by surveying autism diagnosticians.

Methods: 34 participants were recruited through the International Collaboration for Diagnostic Evaluation of Autism (IDEA) Listserv from May 2023 to August 2023 to answer the primary question of the study. Data were collected via an online survey consisting of 20 questions. Due to the recent COVID-19 pandemic, and its impact on direct services, the data were collected across two time periods: January 1, 2019 to December 31, 2021, and January 1, 2022 to present (the time the participant completed the survey). The survey was divided into four sections: (a) Section 1 – participant biographical information; (b) Section 2 – the total number of individuals and the total number of GV individuals seeking an autism assessment from January 1, 2022, to present (Section 2a), and the total number of all individuals and total number of GV individuals who were diagnosed with autism by the participant for January 1, 2022 to present (Section 2b); (c) Sections 3a and 3b – same questions as Section 2 but for the time period of January 1, 2019 to December 31, 2021, and (d) Section 4 – an open-ended comment section. Primary data was analyzed for the frequency of selections within the ranges. A qualitative analysis determined common themes among participants' reports and barriers to assessments.

Results: Compared to the 2019 to 2021 data, the 2022 to present data had an equal or greater number of respondents who reported assessing GV clients in each of the time periods. Similarly, the 2022 to present data had more individuals who reported diagnosing GV clients in each of the provided ranges than 2019 to 2021. Both assessment and diagnosis rates of GV individuals increased or remained stagnant in all ranges for the 2022 to present period relative to the 2019 to 2021 period. This qualitative analysis indicates that assessment and diagnosis rates of GV individuals appear to be increasing over time. Analysis of open participant comments revealed that the age of the clients assessed and the provider location were significant variables in the number of assessments and diagnoses done by each participant.

Conclusions: Clinicians reported an increase in GV individuals seeking autism assessments in their clinics but further research is definitively needed into the co-occurrence of autism and GV in clinics. The study's limitations provide insight into specific recommendations for the field and clinicians moving forward. For future research to be successful, it is imperative that clinicians implement a more comprehensive record-keeping system that includes gender identity.



404.210 Being Aware: Engaging the Community in Development of a Web-Based Tool for Autism Research

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Background: Over the last two decades, the goal of understanding the role of nongenetic factors in autism spectrum disorder (ASD) has resulted in a large and heterogeneous body of research on potential associations with environmental chemical exposures, diet, nutrition, lifestyle, social factors, and maternal medical conditions. The range and diversity of these studies presents a challenge to researchers and the public to understanding the state of the science or effectively using available research to inform decisions. Hence, the goal of turning data on ASD into knowledge motivated the development of a **Web-based tool for Autism Research and the Environment (aWARE)** using a systematic evidence map (SEM) approach.

Objectives: To identify and characterize published literature relevant to environmental chemical exposures associated with ASD, mapping the research gaps and knowledge clusters to enable better understanding of these associations.

Methods: SEMs use the rigor and transparency of systematic review methodology to identify, categorize, and display data in an interactive visual format to aid synthesis and support evidence-based decisions. Our workflow leverages Artificial Intelligence (AI) methods in two steps: 1) to prioritize references for screening, which reduces the screening burden, and 2) for data extraction to capture relevant details from each study (e.g., exposure, model, and measure of ASD-related outcomes). Equally, or perhaps more important than the technical approach, we have engaged the broad autism community, including autistic individuals and families, advocacy groups, clinicians, and researchers throughout the project. Before tool development, we engaged the autism community through four listening sessions conducted between 2022-2023. These listening sessions were small, targeted meetings to identify features that would enhance the tool's use and utility. In the next phase, we developed a beta version of aWARE (limited to studies from the last five years) to obtain input from the autism community before developing the full tool. We conducted a workshop on September 5-6, 2024, to capture user experiences, invite questions, gather feedback, and to listen. Participants were engaged through hands-on testing of the tool, use case presentations, and theme-based breakout sessions.

Results: To develop the beta-version of aWARE, we systematically searched PubMed, Scopus and Web of Science for studies published between 2018-2024. The search yielded 12,218 studies; after removal of 5838 duplicates, 6380 studies were screened using DistillerSR software, and 589 studies included after full-text screening. We used Dextr to extract data from the included studies for display in evidence maps (figure 1). These interactive evidence maps are hosted using Tableau Public at: <http://bit.ly/4ggyl1aA>. At the workshop, we gathered valuable feedback about customizing the aWARE tool to different users, improving search and display, and increasing the scope of chemical exposure. Additionally, participants highly appreciated the plain language summaries and requested adding these accessible summaries for all studies.

Conclusions: The aWARE tool will facilitate better understanding of the associations between environmental chemical exposures and ASD. This tool is one of a kind in merging community engagement with evidence synthesis approaches, thus ensuring the creation of a valuable resource that resonates with diverse perspectives within the community.



404.211 Breastfeeding Duration and Autism Spectrum Disorder: The Role of Sociodemographic and Birth Factors in a Population-Based Study

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Background:

Evidence for a relationship between breastfeeding patterns and Autism Spectrum Disorder (ASD) is inconsistent. Some studies suggest that children with ASD are half as likely to have ever been breastfed, while in contrast others show no significant difference in breastfeeding duration. Breastfeeding challenges may reflect sensory-motor and social-emotional regulation difficulties as well as disruptions in infant-maternal synchrony. Previous studies have identified demographic and birth factors such as maternal education, mode of delivery and prematurity, which may influence both breastfeeding duration and ASD outcomes.

Objectives:

This study aimed to examine the relationship between breastfeeding duration and ASD while accounting for sociodemographic and birth-related factors in an Israeli population, which is a demographically diverse population.

Methods:

This study used a population-based cohort extracted from Electronic Health Records (EHR) through TIMNA, Israel's national health database. The cohort included children born between January 2014 and December 2019. ASD diagnosis was verified through Israel's National Social Security system. Infants with health conditions that impair breastfeeding (e.g., cleft palate, congenital heart disease) and those born prematurely, with very low birth weight, or from multiple births were excluded to minimize confounding factors. Data on breastfeeding duration were collected from routine well-baby visits. Four SES classes were defined based on the SES classification of geographical data from the Central Bureau of Statistics.

Results:

The sample included 780,610 children. After exclusions, the final sample comprised 589,629 (98.1%) with typical development and 11,766 (1.9%) with ASD. A random subsample of 12,000 (2.03%) typically developing (TD) children was selected.

On average, children with ASD were breastfed for a shorter duration (mean = 5 months, SD = 6.10) compared to TD children (mean = 6.61 months, SD = 6.30). Independent samples t-tests showed a significant difference between groups ($t(23764) = 19.13, p < .001, d = .25$). Non-Jewish nationality, lower maternal age, cesarean section and higher SES class were significantly related with shorter breastfeeding duration. Nonetheless, only the two-way ANOVA for SES, showed a significant interaction with ASD ($F(3, 17,536) = 11.46, p < .001$). Post-hoc comparisons showed that both Low SES ASD and Low SES TD groups showed similar significantly longer duration than all other groups ($p < .001$). For all other SES classes, breastfeeding duration was shorter for infants with ASD versus TD.

Conclusions:

Children with ASD tend to have shorter breastfeeding durations compared to TD children, regardless of birth-related factors. SES is significant, with children from lower SES backgrounds demonstrating longer breastfeeding durations, irrespective of ASD status. These findings emphasize the importance of early monitoring for breastfeeding challenges in infants at risk for ASD even when birth-related risk factors are not present.

404.212 Bullying Victimization and Engagement in Bullying Among Autistic Adolescents

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Background: Evidence is growing that autistic individuals are at greater risk of bullying victimization than typically developing peers, which may result from specific challenges in social communication and interaction. Evidence is more limited about risks of different types of bullying victimization, which might vary in autistic individuals. Further, the few investigations of engagement in bullying behavior by autistic youth report conflicting results.

Objectives: We aimed to describe and compare bullying victimization (overall and by type) and engagement in bullying among autistic adolescents and adolescents from the general population.

Methods: The Study to Explore Early Development (SEED) is a multi-site case-control study that identified autistic children using standardized instruments and population comparison children from birth certificate samples in Phase 1 (2006-2011, children 2-5 years old). Caregivers completed a follow-up survey about their child's health and development at 12-16 years old (SEED Teen, 2018-2021). In SEED Teen, caregivers were asked if their adolescent had experienced bullying ever (lifetime experiences) and in the past year (current experiences), and types of bullying currently experienced, including verbal (e.g., teased), physical (e.g., pushed), social (e.g., purposely excluded) or cyber (e.g., hurtful post) bullying. Caregivers were also asked if their child had "ever bullied another child." We compared bullying risks in adolescence between SEED autism and population comparison groups using log binomial regression models to calculate risk ratios adjusted for child sex at birth and maternal education.

Results: Among 165 autistic and 277 comparison adolescents, mean age was 14.7 years (IQR, 14.4, 15.1), 59.7% were male, and 66.1% were Non-Hispanic White. Autistic adolescents were more likely than their peers to have experienced bullying victimization in their lifetime (56.4% vs.

38.6%; adjusted Risk Ratio (aRR)=1.34, 95%CI: 1.08, 1.67) and in the past year (28.5% and 10.1%, aRR=2.58; 95%CI: 1.66, 4.12). The risk of experiencing social bullying in the past year was nearly four times higher in autistic adolescents (19.4% vs 5.4%; aRR=3.75, 95%CI: 2.06, 7.12). Autistic adolescents were also at increased risk for verbal (28.5% vs 9.7%; aRR=2.75, 95%CI: 1.76, 4.41) and physical bullying (10.3% vs. 4.0%; aRR=2.23, 95%CI: 1.04, 5.04) compared to peers. Cyberbullying did not differ between groups (3.6% vs. 4.3%; aRR=0.72, 95%CI: 0.25, 1.94).

Autistic adolescents were more likely than their peers to have ever engaged in bullying (13.3% vs. 5.1%; aRR=2.37, 95%CI: 1.21, 4.81) and to have both ever engaged in and ever been victimized by bullying (versus either alone or neither) (11.5% vs. 3.6%; aRR=2.99, 95%CI: 1.39, 6.83).

Conclusions: Based on caregiver report, autistic teens are at higher risk for experiencing social, verbal, and physical bullying, and for engaging in bullying, compared to peers from the general population. Some autistic youth may have difficulty establishing friendships, and bullying may exacerbate this challenge, leading to further isolation. Social, verbal, and physical bullying can have significant long-term impacts, including aggressive behavior, school problems, and depression. School-wide programs promoting prosocial behavior and social skills potentially could both help autistic teens with social interaction challenges and reduce peer antisocial behaviors that disproportionately impact autistic adolescents.

404.213 Early Life Exposure to Severe Adverse Life Events in the Family and Diagnosed Autism and Autistic-like Traits at Age 3 in Children in the Norwegian Mother, Father and Child Cohort Study (MoBa): Genetically Informative Study.

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Background: Mothers' experience of adverse life events (ALEs, e.g., divorce, bereavement, injury) early in life has been linked with neurodevelopmental conditions like autism, and related traits in children, including social communication differences and difficulties, behavioral inflexibility and sensory processing differences. However, the impact of severe, repeated exposure to ALE during early childhood and the underlying mechanisms are unclear. These associations may also be confounded by unmeasured genetic or early environmental factors shared within families.

Objectives: This study aims to investigate the relationship between severe, repeated early-life exposure to adverse events within the family and the diagnosis of autism, as well as the presence of autistic-like traits in children by age 3.

Methods: This study included 113,496 individuals born in Norway between 1999 and 2009 who participated in the Norwegian Mother, Father and Child cohort study (MoBa), a longitudinal population-based cohort. A total of 47,166 mothers assessed their child's development using Social Communication Questionnaire (SCQ) and reported whether they had experienced severe adverse life events (ALE) when their child was 6 and 18 months old. We examined the association between severe, repeated maternal exposure to ALE and a clinical diagnosis of autism, as well as maternal reports from the SCQ, both in the full sample and sibling comparison (N=11,328).

Results: In the full analytical sample, children of mothers exposed to severe ALEs at one time point had a 40% higher likelihood of being diagnosed with autism (HR: 1.40, 95% CI: 1.19-1.69), and an 87% higher likelihood (HR: 1.87, 95% CI: 1.47-2.35) if exposed at two time points in adjusted models. When accounting for unmeasured familial confounding in sibling comparisons, children whose mothers experienced severe ALE exposure at one time point had HR=2.36 (95% CI: 0.81-4.16) of being diagnosed with autism, and HR=3.89 (95% CI: 1.07-14.22) if exposed at two time points, based on a crude model. After adjustment for birth year HR decreased (HR: 2.01, 95% CI: 0.65 – 6.25; HR: 3.43, 95% CI: 0.91-12.95 for exposure at 1 and 2 time points respectively). In the full sample, maternal exposure to severe repeated ALE was associated with maternal reports of autistic-like traits in children at age 3, with a mean increase in standardized SCQ scores of 0.14 (95% CI: 0.09-0.19) for exposure at one time point, and 0.20 (95% CI: 0.09-0.19) for exposure at two time points in adjusted models. In sibling comparisons, the mean increase in SCQ scores was 0.01 (95% CI: -0.05-0.06) for exposure at one time point, and 0.08 (95% CI: -0.01-0.17) for exposure at two time points in adjusted models.

Conclusions: The association between maternal exposure to severe, repeated adverse life events in early life and the diagnosis of autism or autistic-like traits seem to be explained by unmeasured familial confounding. We recommend using family-based study designs when investigating risk factors for autism to avoid inaccurate conclusions and misinterpretations about the nature of autism.

**404.214** Five-Year Trend in the Incidence of Physical Health Conditions Following Autism Diagnosis: A Nationwide Cohort Study in Taiwan

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Background:

In recent years, the prevalence of autism has increased significantly across the globe. Informed by autistic lived experiences, there is growing concern about the physical wellbeing and co-occurring illnesses in autistic people.

Objectives:

This study aims to assess the incidence rate ratios (IRRs) of co-occurring physical health conditions following a formal Autism Spectrum Disorder (ASD) diagnosis, using a nationwide, population-based claims database from Taiwan, with a particular focus on autistic children diagnosed between 0 to 5 years of age.

Methods:

We analyzed data from the Taiwan National Health Insurance Research Database to assess the incidence of physical illnesses in preschoolers diagnosed with ASD, in the observation window of 2000 and 2019. A total of 45,680 autistic children were matched in age and sex (assigned at birth) in an ratio of 1:20 with 913,600 general population-based comparison group who have not been diagnosed with ASD. IRRs for various physical illnesses within the five years following the ASD diagnosis were calculated using Poisson regression models, adjusted for person-time, with significance level set at $p < 0.01$.

Results:

Taiwanese children newly diagnosed with ASD before 5 years of age experienced elevated risks within the first year after their autism diagnosis for a range of physical illnesses, particularly cerebrovascular disorders, endocrine disorders, and epilepsy. They were also more likely to be diagnosed with intellectual disabilities and congenital abnormalities. The adjusted incidence rate ratios (aIRRs) ranged from 2.30 to 71.42. Although these risks declined over the next four years, they remained significantly higher than those in the non-autistic comparison group, with most aIRRs for physical illnesses exceeding 2 by the fifth year after autism diagnosis.

Conclusions:

This population-based study in Taiwan confirms that autistic children experience the highest risks for co-occurring physical health conditions within the first year following autism diagnosis, with these risks gradually declining but still remaining substantial over the next 4 years. Further research is needed to understand the underlying mechanisms connecting autism to physical illnesses.



404.215 Gender Diversity and Creativity in Communicating Gender Among Autistic and Not-Autistic Four- to Eight-Year-Old Children

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Background: Gender diversity refers to the absence of exclusive congruence between a person's gender identity and their assigned sex. A series of studies have identified a proportional overrepresentation of gender diversity among autistic individuals ranging from school-aged (e.g. Corbett et al., 2022) through adulthood (e.g. Bungert et al., 2024). The Sex and Gender in Autism study investigates children's gender self-concept in the earliest possible period at which young children may be able to communicate their gender-related experiences.

Objectives: (1) We investigated whether 4- to 8-year-old autistic children, as compared to not-autistic children, are more likely to endorse gender diversity. (2) Given findings that autistic people show highly individualized patterns of creativity that emphasize originality and detail (Pennisi et al., 2019), we examined whether expansion beyond common gender conceptualizations differed between autistic and not-autistic youth, and how youth gender conceptualizations related to parent report of gender. Finally, (3), we present case studies highlighting the range and characteristics of personalized systems of gender expression that children designed.

Methods: This study included 173 children ages 4-8 (M age=6.55, SD=1.48; 76 autistic, 97 not-autistic; 73 girls, 94 boys, 6 nonbinary youth). Youth completed the Gender Development Scale (GDS; Strang et al., 2016), a self-report line-based gender assessment method (Gülgöz et al., 2022) of children's gender self-concepts. Parents also reported what they understood their child's gender to be. GDS assessments were hand-coded. Researchers measured the distance from the midpoint of the child's mark(s) to one side of the "girl/boy" line and also recorded whether a response was in the "not a girl or boy" box. Gender-diverse responses were coded as marks more distant from the child's assigned sex, and/or marks in the "not a girl or a boy" box. Scores were averaged across seven items. Some children created their own system for communicating their gender, moving away from the line and box system. T-tests and logistic regressions were conducted in R.

Results: A two-sample t-test revealed significant differences in gender diversity between diagnostic groups, with autistic youth endorsing higher overall gender diversity than not-autistic youth $t(171)=2.33, p=0.02$ (Figure 1). There was no difference between diagnostic groups in likelihood to create a new system to express gender ($\beta_{\text{not-autistic}}=-0.54, SE=0.78, p=0.48$). Logistic regression showed a positive association between parent-reported gender diversity and the child creating a new system on the GDS ($\beta_{\text{gender-diverse}}=1.83, SE=0.90, p=0.042$). Figure 2 presents examples from children who created their own systems, reflecting three overall themes: expressing gender *differently* than the GDS outlines (A & B), expressing *more* about gender than the GDS includes (C), and rejection of classifying gender (D).

Conclusions: This is the first study demonstrating that the proportional overrepresentation of gender diversity in autistic people is observable in early years of child development. Autistic youth were not more likely to move beyond the GDS system for expressing gender. However, given that youth who moved beyond the GDS were more likely gender-diverse by parent report, future studies should investigate more flexible gender report systems to accurately capture gender diversity in young children.

**404.216 Intersectionality of Race/Ethnicity and Sex in Autism: Prevalence, Age of Diagnosis, and Diagnostic Patterns**

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Background: Disparities for autistic people assigned female sex at birth (hereafter “girls”) and children of color (COC) are well documented and include lower and later rates of diagnosis than their White and/or male peers. However, there remain important gaps in our understanding of the diagnostic experiences of marginalized groups, including how having multiple marginalizing identities may have specific or compounded impacts on diagnosis. Our team previously examined diagnostic disparities related to race (Wallis et al., 2023), but that work did not address intersectionality between race, ethnicity, and sex, or the “diagnostic odysseys” (long, complex diagnostic journeys) experienced by many autistic children.

Objectives: Using the same sample as Wallis and colleagues (2023), we aimed to 1) Examine the interactive effects of race/ethnicity and sex on (a) autism prevalence, and (b) age at first documentation of autism diagnosis, and (2) Compare rates and timing of other diagnoses received before autism.

Methods: Participants ($N=23,015$) included all children within the Children’s Hospital of Philadelphia (CHOP) primary care network who (1) presented for a well child visit between ages 16 and 26 months from 2011-2015, (2) were screened for autism at least once, and (3) continued to receive primary care at CHOP through at least 4 years of age. Autism diagnoses and age at first diagnostic documentation were extracted from electronic health records (EHR).

Results: Regarding autism prevalence, we found higher diagnostic rates for Asian, Non-Hispanic children compared to White, non-Hispanic children ($p<0.001$), and for boys compared to girls ($p<0.001$), after controlling for median household income ($p=0.007$). There was no significant interaction between sex and race/ethnicity ($p=0.61$). Regarding age of diagnosis, a Cox regression (accounts for censored time to diagnosis data) revealed significant main effects of sex ($p<0.001$) and race/ethnicity ($p<0.001$). Girls and Asian, non-Hispanic and Black, non-Hispanic children were diagnosed significantly later than male and White, non-Hispanic children; however, the difference between Black, non-Hispanic and White, non-Hispanic children was no longer significant ($p=0.31$) after controlling for median household income ($p=0.01$). Again, the interaction between sex and race/ethnicity was not significant ($p=0.50$).

Conclusions: Results add to previous research demonstrating disparate diagnostic experiences for some marginalized groups. The effect of sex on rates or timing of diagnosis did not differ by race/ethnicity. This may reflect a true lack of a difference (after accounting for income), such that differences between boys and girls are similar across race/ethnicity groups. Alternatively, broad metrics like prevalence and age of diagnosis may not capture subtle differences in the diagnostic experiences of intersectional groups. Given this possibility, we will analyze group differences in “diagnostic odysseys” by examining children’s diagnostic journeys in terms of non-autism diagnoses received prior to an autism diagnosis. Our study may have limited statistical power to detect an interaction with a small effect size, due to relatively small sample sizes in some groups of non-White and non-Black autistic girls (see Table II). Future analyses will include updated data extracted from the EHR to expand our sample to children with more recent diagnoses.



404.217 Investigating the Role of Social Identity Threat in Healthcare Environments Among Autistic Adults

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Background: Social Identity Threat (SIT) describes how fear of being stigmatized or discriminated against because of membership to a marginalized identity or group can impact one’s psychological well-being (Branscombe et al., 1999). SIT is associated with health inequities among other marginalized identities (e.g., racial and ethnic minorities) (Aronson et al., 2013). Patients that experience SIT have reported increased anxiety, lower treatment seeking behavior, and poorer healthcare quality (Abdou & Fingerhut, 2017). Given autism is a marginalized identity, SIT may be a contributing factor in autistic health care inequities. In this study, we measured SIT for autistic individuals’ healthcare environments and the ways in which cues (linguistic, visual, etc.) might trigger or alleviate social identity threat.

Objectives:

We investigate whether autistic individuals experience social identity threat in the context of interactions with a mock health care system using three variables of interest: anxiety, treatment seeking behavior, and impressions of clinic.

Methods:

699 participants were recruited from Prolific. Inclusion criteria stated participants had to be adults (ages 18-45) with native English backgrounds and identify as autistic and/or have an autism diagnosis (professional or self-diagnosis). A between-subjects design, participants randomly viewed mock websites of a mental health clinic that were designed to reflect either the medical model (threat condition) or neurodiversity model (safety condition) of autism/disability. Each website included three webpages: a *Homepage*, welcoming participants, a *What Is* page, describing autism, and a *Meet Therapists* page, showcasing three therapists from the mock mental health clinic. Figure 1 displays the *What Is* page for these two conditions, which differed in both lexical choices (e.g., “deficit” and “characteristics”) and visual display (e.g., puzzle piece and infinity symbol). Each participant viewed the webpages for at least 30 seconds; then, threat was measured through the Spielberger’s State-Trait Anxiety Inventory. Afterwards, participants provided qualitative and quantitative responses about their overall impressions and treatment seeking behavior at either clinic. Independent t-tests were used to analyze mean differences in variables by condition. Qualitative responses were analyzed using VADER, a natural language processing algorithm for sentiment analysis. Data collection is completed.

Results:

We compared differences in treatment seeking behavior, impressions, and state anxiety following each condition. We found that participants who experienced the threat condition were less likely to seek treatment ($d = -0.55$, 95%CI: -0.70, -0.40, $p < 0.001$) and had overall more negative impressions (e.g., “[The clinic] didn’t look like a good place for autistic people”) compared to participants who experienced the safety condition ($d = -0.45$, 95%CI: -0.60, -0.30, $p < 0.001$). Table 1 presents differences by condition for treatment seeking behavior, overall impressions, and anxiety.

Conclusions:

Autistic individuals who viewed mock websites of mental health clinics that promoted the medical model had lower treatment seeking behavior and more negative impressions, on average, than autistic individuals who saw the same type of website, but from a neurodiversity affirming perspective. Future analyses could explore how identification with an autistic identity impacts the perception of social identity threat, possibly building resilience to social identity threat in autistic populations.



404.218 Maternal Health in Pregnancy and Autism Risk – Genetic and Non-Genetic Mechanisms

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Background: Efforts to identify modifiable risk factors for autism have revealed multiple associations between maternal health in pregnancy and autism risk offspring. However, the mechanisms underlying these associations remain unknown, including the role of transmitted and non-transmitted genetic variation.

Objectives: Identify associations between maternal health in pregnancy and autism in offspring, and establish the evidence for familial confounding in those associations.

Methods: We used the Danish registry data (N=1.13M), with 3 generation family linkage, and genotype data (N~130k, iPSYCH) to test the associations between all maternal diagnoses and autism. To triangulate evidence for genetic confounding, we implemented (1) family-based (paternal negative control; sibling comparison; risk in maternal cross and parallel cousins), and (2) polygenic risk score (PRS) analyses.

Results: We identified 30 maternal diagnoses associated with autism risk, after accounting for their comorbidity and chronicity, familial correlations and potential confounders, and controlling for multiple testing. We observed evidence for genetic confounding for most of those associations, including through both direct (psychiatric and neurological disorders) and indirect (obstetric complications) genetic effects. For example, for epilepsy: (i) autism risk was the same irrespective of which parent was affected; (ii) children born to affected mothers had higher autism PRS, compared to children of unaffected women; and (iii) autism risk was the same in offspring of sisters and brothers of women with epilepsy, and for both higher than in the general population.

Conclusions: In summary, associations between maternal health in pregnancy and autism risk are largely attributable to genetic factors, both direct and indirect.

Poster Session**405 - Sensory, Motor, and Repetitive Behaviors and Interests I**

May 1st, 2025, 12:30 PM - 1:30 PM - Hall 4A

405.219 Analyzing Correlations between Oculomotor Behavior and Cognitive Ability in Minimally Verbal Autism

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Background: Because eye movements are tightly coupled to many aspects of neurological processing, analysis of oculomotor behavior during target-based eye tracking tasks may provide insight into specific neurological deficits in minimally verbal autism spectrum disorder (mv-ASD). Due to severe attention challenges and chinrest intolerance within the mv-ASD population, our analysis focuses on target-agnostic oculomotor behavior. We explore oculomotor relationships with standard neuropsychological measures in mv-ASD compared with neurotypical adults.

Objectives: Identify salient correlations of oculomotor behavior with cognitive ability in mv-ASD adults.

Methods: Visually-Guided Saccade (VGS), Fast Smooth Pursuit (FSP), and Slow Smooth Pursuit (SSP) tasks were completed without chinrest by 24 mv-ASD and 19 neurotypical subjects, 18-40 years of age, with Tobii screen-mounted eye tracking. We computed target-agnostic features from the recorded gaze trajectories: gaze entropy (GE) and dispersion, fixation duration and density, saccade amplitudes, peak velocities, durations, main sequence [Gibaldi2021], and Q-ratio [Garbutt2003]. We also measured pupil diameter (PD) as an indicator of cognitive load [vanDerWel2018]. All features except PD were computed with distance-to-target threshold of T=150 pixels to exclude artifacts related to attention loss and task disengagement. We computed within- and between-group Pearson correlations between oculomotor features and raw scores on the Stanford Binet Abbreviated Battery (SB-5), Expressive Vocabulary Test (EVT-3), and Beery Visual-Motor Integration Task (VMI), measuring verbal and nonverbal skills, expressive language, and visual-motor integration, respectively.

Results: Within-group results for mv-ASD (Table 1) show an association between greater PD and lower EVT-3 scores across all three tasks.

Greater horizontal GE in the VGS task, where the target moves only horizontally, correlated with lower VMI, while in the circular trajectory of the FSP task, both horizontal and vertical GE correlated with lower Verbal IQ (VIQ). Also, lower fixation density in FSP correlated with lower VIQ. Top significant between-group correlations include: horizontal GE in each task vs. VMI (VGS: $\rho=-0.60$, FSP: $\rho=-0.71$, SSP: $\rho=-0.63$); horizontal GE vs. EVT in FSP ($\rho=-0.77$); fixation density vs. EVT in FSP ($\rho=0.65$); fixation density vs. VMI in SSP ($\rho=-0.53$). Within the neurotypical group, we observe that saccade dynamics (amplitudes, durations, Q-ratio, main sequence) and fixation durations in Smooth Pursuit, and fixation dispersion in VGS, correlate significantly with various neuropsychological test scores, verbal and nonverbal. PD, fixation density, and GE, all prominent among correlations within the mv-ASD group, are absent within neurotypical group results.

Conclusions: Results indicate relationships between gaze behavior and language ability in mv-ASD. Also, PD correlations with EVT suggest an association between higher cognitive load in oculomotor control tasks and lower expressive language ability that is not observed in the neurotypical group. Absence of saccade feature correlations in mv-ASD suggests greater variability in saccade control compared to neurotypicals, consistently with prior findings in verbal [Schmitt2014] and high functioning [Johnson2012] ASD populations. Correlations between gaze entropy in the oculomotor control tasks and VMI task performance may indicate a common neurological basis underlying fine motor demands of each task.

Future work should investigate these relationships and multivariate interactions using predictive analysis.



405.220 Altered Oculomotor Entrainment in Children with Autism Spectrum Disorder (ASD)

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Background:

Neural activity and behavior of individuals with Autism Spectrum Disorder (ASD) indicate altered synchronization with external events, which could be linked to the rigid routines and restricted interests that define this disorder. Recently, we have shown that children with ASD are impaired in phase locking to, and anticipation of predictable, periodic visual stimuli, as shown by encephalography (EEG).

Objectives:

Test whether oculomotor activity, as indicated by microsaccades and pupil dilation dynamics recorded from children with ASD has intact entrainment to periodic sensory stimuli, when compared with typically developed (TD) controls

Methods:

In this study, 31 children aged 6-9 with an ASD diagnosis and 21 age- and IQ-matched controls engaged in a computerized task, where sequences of four visual stimuli (cues) appeared at equal intervals, followed by an auditory stimulus (target). Oculomotor activity was recorded using Eyelink100© eye-tracking system (sampling rate: 1000Hz), and a video camera. The analysis tracked the entrainment of the pupil and the microsaccades to the rhythm of the cues, in terms of the variability of the pupillary light response latency (Pupil-RT), and the microsaccade inhibition release latency (msRT) in response to each of the cues, as well as to the auditory target.

Results:

Both pupil dynamics and microsaccades showed a periodic pattern of response to the cues in both groups, with the expected repeated constriction events of the pupil, and repeated phasic inhibition of microsaccades, with a final more variable response to the auditory target due to its non-visual modality. Importantly, the variability of both the msRT and the Pupil-RT decreased with the repeated cues in both groups, reflecting increasing temporal entrainment, but this entrainment effect was significantly smaller for the ASD group for both parameters, with a maximal group effect found in the response to the target. Moreover, oculomotor activity was correlated with EEG: significant correlations between oculomotor entrainment measures and inter-trial phase coherence (ITPC) were found across groups.

Conclusions:

Results show overall larger variability of oculomotor activity in children with ASD, with reduced entrainment to the visual sequence. This is in line with the results from EEG done on the same task with the same participants, and, together with finding of oculomotor-EEG correlations indicate analogy between oculomotor activity and EEG in children with ASD.



405.221 The Relationship between Motor Abilities and Cultural Factors in Autistic Children

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Background: Gross motor delays and poor postural control may be an early indicator for autism (May et al., 2016). Poor postural control leads to delays in crawling and walking because postural stability is essential to maintain an upright balance (Koos, 2018). Motor and balance differences continue as autistic children reach school-age (Gladfelter et al., 2020; McPhillips et al., 2014). Cultural factors are known to shape aspects of motor development (Karasik et al., 2010), yet previous studies have not considered cultural factors when analyzing autistic walking gait (Buac et al., 2023). A better understanding of how cultural factors influence balance in autistic children is needed to ensure motor assessments and interventions aimed at autistic children are culturally responsive and therapeutically effective.

Objectives: The purpose of this study was to explore the relationship between balance skills, autism, and cultural factors (i.e., age, gender, socioeconomic status (SES), number of languages spoken, race/ethnicity) in school-aged children. Consistent with previous literature, we predicted that autistic characteristics influenced balance performance. We also predicted that cultural factors would influence balance skills in autistic and non-autistic children.

Methods: To determine which, if any, cultural factors mediate the relationship between balance and autism, 44 children (16 autistic and 28 non-autistic) aged 5-12 years with various cultural backgrounds and autistic traits participated in this study. To assess balance skills, all children completed the Balance subscale tasks on the Movement Assessment Battery for Children- 2nd edition (MABC-2), a standardized assessment of motor skills for children. The balance subscale was chosen because it relates most closely to autism status (Gladfelter et al., 2020; McPhillips et al., 2014). Cultural factors were collected via a parent survey to gather information regarding gender, age, number of languages spoken, racial/ethnic identity, SES, etc. To capture each child's level of autistic characteristics, parents also completed the Social Responsiveness Scale-2nd Edition (SRS-2). Data was then analyzed using a multiple linear regression model to determine which cultural factors mediate the relationship between balance abilities and autistic characteristics.

Results: The linear regression model was a good fit for the data ($F(11, 32) = 5.72, p < 0.001$), and the independent variables taken together accounted for 66% of the variability in MABC-2 Balance standard scores. Degree of autistic traits was the most significant contributing factor (SRS-2 scores $p < 0.001$), along with the cultural factors of gender ($p < 0.01$) and SES (estimated by Caregiver 1 ($p = 0.02$) and Caregiver 2 ($p = 0.03$) years of education).

Conclusions: Consistent with previous research, autism status relates to balance abilities. Also, cultural factors, such as gender and SES, influence balance performance, yet are rarely taken into consideration in autism assessment, intervention, or research. The consideration of cultural factors, especially gender and SES, when conducting future motor research with autistic individuals, is essential to develop effective, responsive assessments and interventions.

405.222 Association between Emotion Regulation and Core Features of Autism Spectrum Disorder

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Background: Autism spectrum disorder (ASD) is characterized by a persistent deficit in social communication and interaction skills, and repetitive and restricted patterns of behavior. The relationships between emotion regulation and core features of ASD are poorly investigated.

Objectives: The aim of this study was to examine the associations between social communication deficits, sensory processing patterns, emotion dysregulation, and repetitive behaviors using structural equation modeling (SEM).

Methods: One hundred and five children with a diagnosis of ASD (between the ages of 3-6 years) and their parents participated in the study. Social communication and interaction skills were measured by Social Communication Checklist-Revised (SCC-R), repetitive and restricted behaviours were measured by Repetitive Behavior Scale-Revised (RBS-R), emotion regulation was measured by Child Behavior Checklist-Dysregulation Profile (CBCL-DP), and sensory processing was measured by Sensory Dunn Sensory Profile (DSP).

Results: According to the SEM, social communication skills predicted sensory processing (0.31), sensory processing predicted emotion regulation (-0.29), and emotion regulation predicted all subtypes of repetitive behavior (repetitive behaviours: 0.24; insistence on sameness: 0.71). We also found that repetitive behaviors were directly predicted by social communication and sensory processing (0.05, -0.03, respectively).

Conclusions: These findings implies that social communication skills are related with sensory features and repetitive behaviours. Interventions targeting social communication may improve emotion regulation, repetitive behaviours and sensory difficulties in young autistic children.

405.223 Attention to Food Stimuli in Autistic Youth: An Eye Tracking Study

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Background: Eye tracking research has revealed attention differences and biases in autism that may contribute to observed phenotypic profiles.

Most eye tracking studies in autism have focused on social stimuli, however, outside of autism, eye tracking has been utilized to characterize attention to food and eating-related stimuli, with attentional mechanisms implicated in the development and maintenance of several eating behaviors and disorders (e.g., Jiang & Vartanian, 2018). Non-autistic children (3-6 years) are distracted more by food stimuli relative to other stimuli and children with quicker fixations to food stimuli had higher BMI scores (Brand et al., 2020). In clinical samples, eye tracking has provided insight into the attention biases of individuals with anorexia nervosa (Giel et al., 2011), binge eating disorder (Sperling et al., 2017), and obesity (Doolan et al., 2017). Given that challenging eating behaviors, and later diagnoses of eating disorders and obesity, are common in autism (Healy et al., 2019; Sharp et al., 2013), eye tracking may elucidate attentional biases that underlie developmental risk for later adverse health outcomes.

Objectives: Characterize attentional biases to food stimuli by diagnosis (autistic, non-autistic) and appeal (high appetizing, neutral, low appetizing) using a novel paired preference eye tracking paradigm.

Methods: 49 children (4 to 10; 14 autistic) completed a paired-preference eye tracking paradigm, where they viewed a series of paired food images drawn from the International Affective Picture System (IAPS; Lang et al., 2005). Food stimuli is categorized as high appetizing, neutral, or low appetizing (Figure 1). A total of 78 pairs (each shown twice), equally split by high-neutral, high-low, neutral-low pairings and counterbalanced across participants, were shown for 5 seconds while the child passively attended to the screen. Gaze data was collected via Tobii Pro.

Results: Autistic children attended less overall to the paradigm (all p 's $< .005$) therefore proportional data is used for the following analyses. There were no significant differences in the proportion of attention autistic and non-autistic youth directed towards high, neutral or low appetizing foods (Figure 2a). Non-autistic youth directed more discrete fixations to foods categorized as neutral, $t(47)=2.02, p=.02$ (Figure 2b) and their fixations were longer to high appetizing stimuli, $t(47)=1.96, p=.03$ (Figure 2c). Autistic youth were slower to orient to food categorized as neutral, $t(47)=-2.36, p=.01$ (Figure 2d) than non-autistic youth.

Conclusions: Attentional patterns to food stimuli were strikingly similar between autistic and non-autistic youth (Figure 2), however some nuanced differences were found: autistic youth directed fewer fixations and were slower to attend to *neutral* foods. These foods include several fruits (e.g., watermelon, cherries, pears) as well as common snacks or meals (e.g., grilled cheese, tacos, granola bar). While preliminary, our data suggests high and low appetizing foods may have unique attentional components (e.g., approach or avoidance) when compared to neutral foods. Future directions include expanding this data to a larger sample of autistic youth oversampled for assigned females (anticipated N by April 2025 = 100), the impact of stimuli pairing (high-neutral, high-low, neutral-low) on attention profiles, and associating attentional patterns with parent-rated eating behaviors.

**405.224 Auditory Imbalance between Spectral and Temporal Processing in Autism**

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Background: Altered perception of fine acoustic details may exert deleterious or beneficial effects on the development of higher-order language skills in children with autism. Multiple research groups (e.g., Haesen et al., 2011; Yu & Wang, 2021) have suggested an imbalanced auditory profile in autism, characterized by enhanced spectral (frequency) processing but diminished temporal (timing) processing. However, direct empirical evidence for this hypothesis remains scarce.

Objectives: This study aimed to examine the auditory processing abilities of children with prototypical autism, focusing on their capacity to process both temporal and spectral information—two key, complementary aspects of human auditory perception. The data will help 1) determine whether there is an imbalance in autistic auditory system between spectral and temporal processing; 2) explore sensory correlates of atypical hemisphere specialization in terms of spectral (right hemisphere) vs. temporal (left hemisphere) processing; 3) understand the potential role of low-level auditory functions in language development in prototypical autism.

Methods: Participants included 21 children with autism aged 8-12 years and 23 age-and-sex matched typically developing (TD) children. The autistic children were screened for a prototypical presentation of autism according to criteria in Rabot et al. (2023). Temporal gap detection (TGD) and frequency modulation detection (FMD) tasks were employed to assess auditory temporal and spectral resolution, respectively. An imbalance index (IBI) was introduced to estimate each individual's temporal-spectral processing imbalance (IBI > 1 indicates spectral dominance; IBI < 1 indicates temporal dominance).

Results: Children with autism exhibited significantly higher TGD thresholds and lower FMD thresholds compared to TD children, reflecting impaired temporal precision and enhanced spectral precision. The IBI further demonstrated a significant group difference (autism = 1.69, TD = 0.58; $p < .001$), indicating spectral dominance in autism and temporal dominance in the TD group. In the autism group, lower TGD and FMD thresholds were associated with higher overall language proficiency, a pattern not observed in the TD group.

Conclusions: Children with autism exhibit an imbalanced auditory profile, characterized by relative deficiencies in the temporal domain and enhancements in the spectral domain. This study provides the first empirical evidence of such auditory imbalance in prototypical autism. The results also support the hypothesis of enhanced right but decreased left hemisphere functions in autism. These alterations in the low-level auditory functions may shape language development in this group. The findings emphasize the importance of considering sensory factors and their specific pathways of influence on speech and language development in autistic individuals.

405.225 Autism Stakeholders' Perceptions of Restricted and Repetitive Behaviors and Interests in Autistic Children Systematic Review

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Background: Attitudes differ about the nature of the specific repetitive behaviors and interests (RRBIs) in autistic children across behaviors. Historically, RRBIs have been considered purposeless, but recent research has contradicted prior assumptions and shown that RRBIs may sometimes be advantageous.

Objectives: To examine stakeholders' attitudes about RRBIs.

Methods: Three databases (Ovid-PsychINFO, Ovid-MEDLINE, and CINAHL) were searched in July, 2024 and produced 1,558 articles. Of the 1,558 articles, 1,111 were screened and 129 were retrieved for full-text review. 15 articles met inclusion criteria, and two more were added later on, resulting in 17 total articles. This systematic review and protocol were registered and approved with Prospero (CRD42024575580). No funding supported this review. Included studies focused on children ages 3-18 with a confirmed autism spectrum disorder (ASD) diagnosis, were published in the past ten years, and explored repetitive behaviors as an outcome measure. Excluded studies were published more than ten years ago or consisted of the wrong population. The first six authors screened these studies, reached a consensus on the articles included, and then synthesized the themes that emerged.

Results: This review examined 17 articles with 3,258 total participants. Data gathered from various stakeholders presents mixed findings on attitudes about some RRBIs including ritualistic, sameness, compulsive, restricted, and stereotyped behaviors. Results are divided into categories pertaining to impact on a child's occupational performance, impact on a child's emotional regulation, and impact on a child's family, teachers and clinicians. Limitations included high frequencies of parent responses, unequal gender distribution of participants, and small sample sizes. Some studies found that RRBIs such as ritualistic behaviors may have negative consequences, however, other studies recognized that stereotyped behaviors may be of benefit to autistic children. Restricted, compulsive, and sameness behaviors depend upon many factors and should be studied further. Stakeholders should recognize the invaluable information discovered on the impact of RRBIs and ensure autistic voices are represented.

Conclusions: Findings suggest that not all RRBIs are considered problematic and should not be targets for intervention. Evidence indicates that stereotyped behaviors may be advantageous, but ritualistic, restricted, compulsive, and sameness behaviors should be studied further to understand contextual factors and assess potential benefits. This review provides insight for understanding stakeholder attitudes about the impacts of RRBIs on autistic children's occupational participation, emotional regulation, and influence on family, teacher, and clinician dynamics.

405.226 Autistic Individuals Show Increased Variability of Spatiotemporal Dimensions of Gait from Childhood through Adulthood

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Background:

Sensorimotor issues, including gait atypicalities, are prevalent in autistic individuals and are associated with poorer social-communication and adaptive skills, highlighting their clinical significance. While gait issues are commonly reported in autism, findings are inconsistent across studies. These inconsistencies likely reflect, at least in part, differences in sample ages – walking undergoes complex maturational changes from the first year of life into adulthood – and in the spatiotemporal gait variables that are selected for analysis, as separate component gait processes may be variably affected across individuals.

Objectives:

To define autism-associated differences in gait function across a broad range of ages and parameters.

Methods:

Sixty autistic individuals (ages 4-35 years) and 53 age-, sex-, and IQ-matched neurotypical controls completed trials of unconstrained walking (3-5 meters depending on site) at a self-selected pace. Motion capture cameras tracked 16 reflective markers attached to participants' major joints. Common spatiotemporal metrics of gait were derived from the motion capture data and analyzed with multivariate analysis of covariance. Gait variables that were significantly different across groups were included in a canonical correlation analysis with demographic variables (group, age, sex, IQ) to derive a composite gait score that accounted for multicollinearity across discrete gait and demographic variables. Composite gait scores were examined in relation to age and autistic traits.

Results:

Seven variables relating to variability (standard deviation; SD) of gait component processes differentiated autistic and neurotypical individuals: cadences_{SD} ($F=5.63$, $p_{FDR}=.03$), step widths_{SD} ($F=8.02$, $p_{FDR}=.01$), step velocity_{SD} ($F=10.24$, $p=.01$), hip angle_{SD} at heel-strike ($F=8.55$, $p_{FDR}=.01$), hip angle_{SD} at toe-off ($F=13.21$, $p_{FDR}=.004$), and knee angle_{SD} ($F=8.48$, $p_{FDR}=.01$) and ankle angle_{SD} ($F=5.07$, $p_{FDR}=.04$) at heel strike. These seven variables were subsequently included in the canonical correlation analysis. One canonical variate, referred to as “composite gait variability”, explained significant variance in the data ($F=2.82$, $p<.001$). Autistic individuals showed higher composite gait variability than neurotypical individuals ($t=3.76$, $p<.001$, $d=.727$), and the composite gait variability dimension showed a larger effect size than group comparisons of each discrete gait variable ($d_s \leq .628$). Composite gait variability was inversely associated with age across both groups ($\rho=-0.38$, $p=.005$) and positively correlated with more severe ritualistic behaviors in autism ($\rho=0.37$, $p=.01$).

Conclusions:

Findings that gait variability selectively differentiated autistic from neurotypical individuals are consistent with prior studies reporting increased variability of spatiotemporal dimensions of gait in autism. Importantly, our composite gait variability dimension was more robust to autistic gait differences than any discrete gait variable suggesting that gait in autism is characterized by elevated spatiotemporal variability across multiple parameters. While gait variability was elevated in autism, it showed similar age-related reductions in autism and neurotypical development suggesting that differences are persistent across childhood and adulthood. The relation of composite gait score to repetitive behavior in autistic individuals suggests that gait issues may share important neurodevelopmental mechanisms with core autistic traits.

405.227 Autistic Persons with Auditory Difficulties: The Use of Audio Technology. a Scoping Review

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Background:

Given the high prevalence of auditory sensory difficulties in the autistic population (e.g. Williams et al., 2021), it is likely that autistic persons face challenges as a result of the sounds they are exposed to in their daily lives. This can lead to avoidance of certain environments and interactions, reduced participation or engagement in important life activities and performance-impairing distractibility, all of which have been reported to affect overall quality of life (e.g. Pfeiffer et al., 2019).

Audio technologies can enhance the auditory environment for autistic people who are sensitive to sound (e.g. Ikuta et al., 2016). While the use can be beneficial in several ways, there are also concerns about the potential disadvantages that its use may cause (e.g. Neave- DiToro et al., 2020). Despite the widespread use of audio technology in everyday life for many autistic persons, there is little empirical research to justify proper use, and the current body of research does not fulfil the standards of evidence-based practice (Kulawiak, 2021).

Objectives:

Map the extent and type of evidence that exists on the use of audio technology for autistic persons with auditory difficulties and identify potential research gaps in the existing research field.

Methods:

This scoping review is conducted in accordance with the JBI guidelines for scoping reviews (Peters et al., 2020) and the PRISMA ScR (Tricco et al., 2018).

It includes peer-reviewed empirical research studies with no restrictions on study design or year of publication. Participants are autistic persons and there are no age or gender restrictions. The concept is use of audio technology as an aid for autistic people to modify their experience of sound.

Sources of evidence from any contextual setting would be eligible for inclusion. The databases searched include PubMed, ERIC, Web of Science Core Collection, Apa PsycInfo, Cinahl, IEEE Xplore, ACM Digital Library.

Results:

The initial search resulted in 5417 publications and the screening resulted in 17 publications meeting the inclusion criteria. See Flow chart (Fig. 1) for the details. The total number of autistic participants in the included publications was 325, 16% whom were female. The reported mean age ranged from 8.2 to 14.5 years. Quantitative methodological approaches with experimental research design were used in the majority of studies (16). The audio technologies addressed in the studies were remote microphone systems (10), noise-attenuating headphones (5), headphones (1) and earbuds (1). Listening in noise was the most frequently reported target area.

Conclusions:

The studies report potential positive outcomes of different types of audio technologies that may be useful for autistic people who are sensitive to sound in different contexts. However, there is a paucity of research in this area and there are several research gaps that need to be explored. For example, studies that include a wider variety of methodological approaches, focus on a wider range of participant demographics (age, gender, ID), and take place in a wider variety of contextual settings and different types of technology used. Increased focus is also needed on the potential disadvantages of using audio technology.



405.228 Autistic Traits and Auditory Rate Discrimination in Autistic Children

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Background:

Sensory features are extremely common in Autistic people, with the majority of Autistic people exhibiting differences in sensory processing compared to Allistic controls. Recent research suggests differences in sensory processing, even low-level sensory processing, can have cascading, downstream effects on social features and repetitive behaviors/interests present in Autistic people. Research has found that many Autistic people have difficulty with the temporal component to auditory processing, with some Autistic people displaying difficulty discerning the speed and length of auditory stimuli. Importantly, these sensory differences have been specifically associated with processing speech sounds and language.

Objectives:

The present study examined differences in auditory rate discrimination between Autistic and Allistic people and index of auditory temporal processing, and the relationship between temporal processing and traits associated with Autism.

Methods:

The project consisted of two sequential studies using the same auditory rate discrimination paradigm. For the first study, a non-clinical sample of university-aged adults were recruited (N=48). For the second study, children with Autism (N=23) and typically developing children (N=33) were recruited.

For both studies, participants completed three Autism-related questionnaires: the Autism Spectrum Quotient (AQ), the Broad Autism Phenotype Questionnaire (BAPQ), and the Repetitive Behaviors Questionnaire. Participants were then presented with a slideshow explaining the rate discrimination task (See Figure 1 a–c). A series of auditory stimuli with varying frequency (3-20Hz) were presented, with the instructions to categorize them as “fast” or “slow”, and participants were trained on the extreme examples (3 & 20Hz). The rates were spaced such that the intervals between different rates were *perceptually* equivalent. In total, participants completed 200 ratings, with the fast (20Hz) and slow (3Hz) stimuli presented more frequently than the other stimuli. Each participant’s data were fitted with a sigmoid function, and perceptual reliability measures were calculated representing the consistency of an individual’s temporal precision (Figure 1d).

Results:

In experiment 1, correlational analyses were conducted between reliability scores and the three Autism-trait questionnaires. As predicted, in the non-clinical adult sample, significant correlations were observed such that people with more Autistic traits had less reliable auditory temporal perception). In experiment 2, comparing Autistic and Allistic samples, we were surprised to find no statistical difference between diagnostic groups. Future analyses will be presented examining the relationship between Autistic traits and temporal perception in our Autistic sample.

Conclusions:

The correlation between Autistic traits and auditory temporal perception in the general population supports the premise that a temporal perception is related to traits associated with Autism, but the lack of differences by diagnostic group suggests that this relationship may not be specifically related to Autism per se, but may be associated with Autism-related traits more broadly. Further study involving different audio processing paradigms may further explain auditory processing differences in Autistic people.



405.229 Automated Detection of Play Behavior in the ADOS-2 Make-Believe Play Task Using Composite AI

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Background: Accurate assessment of play behavior is key in evaluating Autism Spectrum Disorder (ASD), particularly during the 'Make-Believe Play' task of the Autism Diagnostic Observation Schedule-Second Edition (ADOS-2). Current methods rely on subjective human observation, which can be time-consuming and inconsistent. Automated detection of play behaviors could improve the efficiency and objectivity of ASD assessments, but remains challenging due to the complexity of hand-object interactions.

Objectives: This study aims to 1) develop an automated system for detecting the first instance of play interaction during the ADOS-2 Make-Believe Play task, potentially serving as a diagnostic cue given that ASD and Typically Developing (TD) individuals play behavior may differ significantly; and 2) evaluate how the system can augment traditional clinical observations by enhancing the detection of subtle or complex play behaviors that may be difficult to detect through human observation alone.

Methods: Our work involves ADOS-2 Module 3 session recordings from a US based university clinic dataset, featuring 32 children (22 male, 10 female; total mean age: 9.38±1.74 years). The participants included 27 children with ASD and 5 TD children. Three annotators established the ground truth by recording the first play interaction time in each video. We developed a novel Composite AI framework that integrates several deep learning models, including object detection and segmentation, tracking, depth, age, gender, hand and body pose, and optical flow estimation. A rule-based system combining the outputs of all models was implemented to detect the initiation of hand-object interactions indicative of play behavior.

Results: The system detected the first play interaction in 21 out of 32 videos, achieving a detection rate of 65.63%. The mean time difference between the correctly predicted and annotated first play interactions was 0.69 seconds. Of the 11 unsuccessful cases, 7 (63.6%) were attributed to model limitations: 4 cases of hand keypoint detection failure and 3 cases of incorrect toy detection. The remaining 4 cases (36.4%) were associated with environmental constraints in the clinical setting: 2 cases involved toys with dimensions below the threshold for reliable detection, 1 case where occlusion made the object undetectable and 1 case with blurring due to fast movement distorted the video quality.

Conclusions: This study demonstrates the potential of integrating multiple AI techniques to automate the analysis of child play behavior, achieving promising results without task-specific training. Model limitations, especially in object and hand detection, represent a key area for improvement, which should change as individual models advance. Furthermore, the findings underscore the importance of standardized recording settings as high-resolution and fast multi-camera detection in clinical settings can further enhance performance. Future work should involve larger and more diverse samples and assess the system across different age groups and play scenarios. As technological advancements continue and clinical conditions are optimized, we anticipate significant improvements in the accuracy and reliability of automated play behavior analysis in ASD assessments.

405.230 CAMI-2DNet: Computerized Assessment of Motor Imitation for Distinguishing Children with Autism in Video

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Background:

Motor impairments, including motor imitation, are common in individuals with Autism Spectrum Disorder (ASD), such that quantifying motor imitation could prove useful for phenotyping autism. Traditional methods assessing motor imitation required Human Observation Coding (HOC), a subjective, labor-intensive process. Addressing this, we developed semi-automated Computerized Assessment of Motor Imitation (CAMI) methods to quantify imitative performance, first using 3D (CAMI-3D) and then using 2D (CAMI-2D) videos. In published studies, we showed that both CAMI-3D and CAMI-2D reliably distinguished children with ASD from typically developing (TD) children. However, these methods still require somewhat labor-intensive and subjective manual correction and HOC annotations for training.

Objectives:

To address the limitations of previous methods, we developed CAMI-2DNet, a deep learning-based approach that eliminates the need for HOC annotations and manual joint correction. We then validated CAMI-2DNET, comparing performance to prior methods (CAMI-3D, CAMI-2D).

Methods:

CAMI-2DNet utilizes a pose estimation network to extract a sequence of 2D joint positions from videos, learning to map it to robust motion representations that are disentangled from nuisance factors. To effectively learn these disentangled representations, we employ synthetic data, generated by motion retargeting of virtual characters through reshuffling motion, body, and camera views, in addition to child experimental data. The synthetic dataset consisted of 18 different 3D categories with 4,428 base motions with 103,143 variations. The child experimental dataset included 194 children, 6-12 years (88 ASD, 106 TD) who participated in an imitation task consisting of two brief (one-minute) independent movement sequences (Seq1 and Seq2). CAMI-2DNet automatically generates a score for these sequences by computing a similarity score between motion representations. Scores were also generated using CAMI-3D, CAMI-2D and HOC. Each method's ability to classify children into diagnostic (ASD vs. TD) groups was evaluated by calculating the receiver-operating characteristic (ROC) curves across both sequences from 47 participants (27 ASD, 20 TD) with HOC scores, with larger areas under the curve (AUC) indicating better discriminative ability. We also examined the validity of the CAMI methods by analyzing their correlation with "gold standard" HOC scoring.

Results:

Assessment of correspondence with manual HOC scoring was strongest for CAMI-2DNet ($r=0.71$) (Fig.1c) as compared to CAMI-3D ($r=0.69$) (Fig.1a) and CAMI-2D ($r=0.66$) (Fig.1b).

Assessment of diagnostic (ASD vs. TD) discriminative ability across both sequences revealed CAMI-2DNet had $AUC=0.843$, which neared that of CAMI-3D ($AUC=0.859$) and outperformed CAMI-2D ($AUC=0.789$) and HOC ($AUC=0.792$) (Fig.1d). On Seq1, CAMI-2DNet ($AUC=0.885$) outperformed both CAMI-3D ($AUC=0.794$) and CAMI-2D ($AUC=0.785$) (Fig.1e). For Seq2, CAMI-2DNet ($AUC=0.825$) outperformed CAMI-2D ($AUC=0.802$) and neared CAMI-3D ($AUC=0.906$) (Fig.1f).

Conclusions:

These results demonstrate that the newly developed CAMI-2DNet method provides a reliable, automated alternative to previous, labor-intensive CAMI methods (CAMI-3D, CAMI-2D) for quantifying motor imitation. CAMI-2DNet, which does not require manual correction or HOC annotation during training, showed a strong correlation with "gold standard" HOC scores and performed similarly, if not better, at classifying children as ASD or TD when compared with previous methods. CAMI-2DNet offers a highly scalable method for assessing motor imitation that could prove valuable for autism phenotyping in accessible (clinic, home) settings.

**405.231 Characterizing Neural Tactile Processing Differences to Spatial Context in Autism**

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Background: Autism Spectrum Disorder (ASD) is characterized by atypical sensory processing that negatively impacts quality of life. Previous work has demonstrated that atypical sensory processing consists of co-occurring hyper- and hypo-reactivity in response to different tactile stimuli. Therefore, investigating reactivity to various levels of tactile stimulation may enhance our understanding of how individuals process sensory information. Previous studies have shown altered encoding of spatial context in ASD sensory responses. However, many existing paradigms studying this phenomenon cannot be readily used with children with ASD. As such, objective measures are needed to investigate differences in sensitivity to spatial context of tactile stimuli in children with ASD.

Objectives: The present study uses electroencephalography (EEG) paired with a novel tactile paradigm to investigate (a) event-related potential (ERP) response differences to the spatial context of tactile stimuli in young children with ASD and typical development (TD) and (b) how these differences relate to response to tactile stimuli duration.

Methods: We developed two versions of a novel tactile paradigm. Version 1 consisted of 32 Hz vibrotactile stimuli, each with a 2000 ms duration, which were delivered to either the right index finger, right middle finger, or both of the right index and middle fingers simultaneously. Each of the three conditions was presented 20 times. In Version 2 of the paradigm, each stimuli had a 500 ms duration with each condition presented 40 times. EEG data were collected during Version 1 from 17 3–4-year-old children (4 ASD, 13 TD) and Version 2 from 15 3–4-year-old children (6 ASD, 9 TD) with data collection ongoing. Data were collected with 128-channel Hydrocel Geodesic Sensor Nets and NetStation software (Magstim EGI, Eugene, OR, USA). The Batch EEG Automated Processing Platform (BEAPP) and the Harvard Automated Processing Pipeline for Electroencephalography (HAPPE) v3 were used for pre-processing. The peak amplitude of the P1 component (50–125ms) at electrode C3 was extracted for each participant in each condition. The average differences in the P1 component between dual-finger (both) and single-finger (index; middle) stimulations were computed for each participant to capture sensitivity to spatial context using the following formula:

$$P1 \text{ Amplitude Difference} = (((|SEP(Both) - SEP(Index)|) + (|SEP(Both) - SEP(Middle)|))) / 2$$

Results: Preliminary results suggest that, on average, children with ASD who experience tactile stimuli of 2000 ms durations have a greater sensitivity to spatial context, as measured by P1 average amplitude difference, between dual-finger and single-finger stimulations ($M=4.03$, $SD=1.15$) relative to TD children ($M=2.46$, $SD=1.37$), with a trend towards significance (Figure 1A), $t(15) = 2.06$, $p = .057$. This relationship is insignificant for tactile stimuli of 500 ms durations (Figure 1B), $p = .963$.

Conclusions: These findings demonstrate that following a longer stimulus duration, children with ASD respond with more neural sensitivity to tactile stimuli of various spatial contexts than TD children. Further, these findings suggest that children with ASD may experience atypical processing of tactile information based on spatial and temporal characteristics of the stimuli. This work will enhance our understanding of atypical sensory processing in ASD and potentially inform clinical advancements in the field.



405.232 Characterizing Sleep in Children with Autism Spectrum Disorder and Sensory Processing Concerns

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Background: Sleep is vital to emotional and physical health and overall life enjoyment. Children with autism spectrum disorder (ASD) often have trouble sleeping and sensory processing challenges. Thalamocortical circuits modulate both sleep and sensory processing, and indeed previous studies report that children with more severe sleep disturbances have a higher prevalence of atypical sensory processing. However, the relationship between sleep and sensory processing challenges have not been extensively studied in children with atypical sensory processing who do not meet criteria for ASD. Parent surveys and clinical sensory observations can serve as a springboard to objectively understand how sleep and sensory processing impact each other in children with and without ASD.

Objectives: This study assesses children with ASD, children with sensory processing concerns (SPC) who do not meet criteria for ASD, and children with typical development (TD) to determine: (a) group differences in sleep challenges (b) the correlation between sleep and sensory processing, where sensory processing is measured by parent report and clinician observation.

Methods: 59 3- to 4-year-old children (20 ASD, 20 TD, 19 SPC) have participated in the current study, with data collection ongoing (target N = 120). Sleep quality was assessed using the Child Sleep Habits Questionnaire (CSHQ). Higher CSHQ total sleep disturbance scores indicate lower sleep quality. The Sensory Assessment for Neurodevelopmental Disorders (SAND) was used to measure sensory behavior through a clinician assessment and parent interview. Higher SAND scores indicate an increase in sensory sensitivity. Group differences were assessed by ANOVA and correlations were assessed using linear regression.

Results: ANOVA results reveal significant differences between all groups in total SAND sensitivity scores, $F(1,43) = 29.51$, $p < 0.001$, $\eta^2=0.58$ (Figure 1a). Total SAND hyperreactivity scores were found to be significantly different between ASD and TD groups only ($p = 0.05$) where individuals with ASD had higher scores. Preliminary ANOVA results reveal significant differences between groups in total sleep disturbance scores measured by the CSHQ, $F(1,59) = 7.19$, $p = 0.002$, $\eta^2=0.20$ (Figure 1b). Post-hoc analyses of total sleep disturbance scores revealed significantly larger scores in ASD compared to TD. There is no significant difference in SPC compared to ASD or TD. Furthermore, linear regression analysis reveal positive correlations between total sleep disturbance scores and both total sensory sensitivity scores, $F(1,44)=6.29$, $p=0.02$, $R^2=0.11$ (Figure 1c) and total sensory hyperreactivity scores, $F(1,44)=6.39$, $p=0.02$, $R^2=0.11$. No significant differences were found between total sleep disturbance scores and total sensory hyporeactivity ($p = 0.10$) or seeking scores ($p = 0.097$).

Conclusions: These findings align with prior research that shows sleep quality and sensory processing are both significantly different between individuals with ASD and TD. The results also suggest that sensory processing and sleep quality interact. Future studies that objectively measure sleep quality and neurophysiology (e.g., sleep EEG) would provide opportunities to better understand how shared thalamocortical circuitry function impacts sleep and sensory processing.



405.233 Clinical Correlates of Motor Function in Autistic Adults

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Background: Challenges in motor coordination are a prominent feature of autism spectrum disorder (ASD) across the lifespan, with a co-occurrence rate of 50-80%. Recent studies have demonstrated a bi-directional relationship between motor skills and core autism symptoms. However, evidence regarding the impact of motor skills on other areas of function remains limited, and most research focuses on children and adolescents. The role of motor skills in autistic adults and their relationship to various functional domains are largely underexplored.

Objectives: This study aims to explore the association between motor difficulties and autistic traits, sensory features, and executive function in autistic adults.

Methods: We recruited 60 adults on the autism spectrum (15 females), aged 19 to 43 (mean age 29.2 ± 6.3), from the Department of Psychiatry at National Taiwan University Hospital. Motor coordination was assessed using the Timed Up and Go (TUG) test, which measures the time it takes to rise from a standard chair, walk three meters, turn around, walk back to the chair, turn before sitting, and sit down again. It has been shown to be reliable in teenagers with ASD. Longer test times indicate poorer motor control. The duration of each TUG phase was recorded using a G-WALK® sensor on a waist belt at the L2 level. Meanwhile, the Social Responsiveness Scale (SRS), Sensory Profile (SP), Behavior Rating Inventory of Executive Function (BRIEF), and Autism-Spectrum Quotient (AQ) were used to evaluate social behavior, sensory features, executive function, and overall autistic traits, respectively. Higher scores suggest greater challenges in the given area. Pearson correlation analysis was used to examine the association between TUG phase durations and each clinical scale, controlling for weight, height, and gender.

Results: All participants were able to complete the measurement without stopping during the tasks. **Fig. 1** presents the partial correlations and p-values between TUG phase durations and each clinical scale. Overall, longer test times were associated with greater difficulties in corresponding functional domains. Specifically, difficulties in Social Emotion, Sensory Registration, BRIEF-Initiate, Global Executive Composite, and Metacognitive Index were correlated with longer end-turning phase and total test durations. Additionally, Attention Switching was linked to increased time spent during total test duration, as well as the forward and return gait phases. Extended times in both the sit-to-stand and stand-to-sit phases were associated with difficulties in Social Awareness, while being inversely related to Sensory Seeking. Of the six phases, the end-turning phase duration and total test duration showed the strongest correlations with clinical variables. Notably, Total SRS, Sensory Sensitivity, and BRIEF-Shift were positively correlated with the end-turning phase duration, while BRIEF-Inhibit, Working Memory, Plan/Organize and Organization of Materials were associated exclusively with total test duration.

Conclusions: The findings suggested that slower motor coordination was correlated with sensory features, executive function, and social behavior, emphasizing the need for greater clinical attention to motor difficulties in autistic adults. It is also important to note that the absence of intelligence quotient as a controlling variable may introduce confounding factors. Future investigation is needed to validate our findings.



405.234 Altered Auditory Modulation in Children with Autism Spectrum Disorder

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Background: In our everyday experience, important sound stimuli (e.g. conversation) typically co-occur with noise (e.g. wind, traffic). The ability to discriminate target sound stimuli from noise is imperative for young children's development of speaking ability and their awareness of the environment, two skills that children with autism spectrum disorder (ASD) often struggle with. Electroencephalography (EEG) recording offers opportunities to explore the association between stimuli salience and auditory middle latency responses (MLR), responses to auditory stimuli that occur 10-75 milliseconds after stimulation. Past research has shown the distance between the amplitude of two consecutive MLR components, Na and Pa, to be positively correlated with listener's loudness judgment. However, to date, no EEG study has investigated how TD children and children with ASD differ in their responses to auditory stimuli of varying salience, as influenced by the introduction of background noise.

Objectives: This study aims to evaluate: (1) how varying levels of background noise play a role in affecting young children's brain response to target tone stimuli, and (2) how the effect of background noise on Na and Pa amplitudes differs for TD and ASD children.

Methods: We created a novel paradigm to test MLR to target tones in background noise. Participants are presented with 3600 randomized tones (1200 tones at each volume level: low, medium, high) that are each 0.1ms in duration. Among the 1200 tones of the same volume level, an equal number of tones are presented concurrently with a low, medium, and high background white noise. EEG data were collected with Geodesic Sensor Nets through NetStation software (Magstim EGI, Eugene, OR, USA). Data was preprocessed by using the Batch EEG Automated Processing Platform (BEAPP) and the Harvard Automated Processing Pipeline for Electroencephalography (HAPPE) v3. The amplitude of the Na-Pa peak-to-peak distance measured at electrode C5, as previously described for MLR analyses, was extracted from the average ERP of each participant. Data collection is ongoing, with a current usable sample size of seven 3-4 years old children (4 TD, 3 ASD). Target sample sizes for this study are 25 TD and 25 ASD.

Results: Results suggest that, at high background noise level, as tone volume increases, children from both the TD and the ASD group show increased Na-Pa peak-to-peak distance at electrode C5 (Figure 1a). In addition, children with ASD show such an increase at a steeper slope than TD children (Figure 1b), $t(5) = -4.89$, $p < .001$, $d = -3.73$, suggesting between-groups differences in brain activity in response to auditory stimuli delivered concurrently with noise. Currently, there are no significant group differences at lower levels of background noise.

Conclusions: These results indicate that children with ASD exhibit a greater rate of increase in brain activity in response to the amplification of target tone amidst high background noise, suggesting that children with ASD may have atypical auditory processing or attentional difficulty when presented with competing sounds. Continuing to monitor this finding will advance our understanding of the atypical sensory processing observed in many children with ASD.



405.235 Differences in Sensory-Motor Profiles between Low Risk and High-Risk Infants: Preliminary Results from ERI-Sibs Project (Early Recognition and Intervention in SIBlings at High Risk for Neurodevelopment Disorders)

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Background: Recent research underscored the importance of early diagnosis and intervention in children at risk of neurodevelopmental disorders. For example, siblings of children with autism spectrum disorder (ASD) are at increased risk of abnormal developmental trajectories, even in the absence of a specific diagnosis (McDonald et al., 2020). Several authors suggest that, before the 18 months of life, atypia in sensory-motor profiles may precede social communication symptoms in these infants (Costanzo et al., 2022; Esposito et al., 2009; Purpura et al., 2017; Srinivasan & Bhat, 2016; Van Etten et al., 2017). Bhat et al. (Bhat et al., 2012) reported a correlation between early visual-motor integration skills and late social-communication abilities. Bradshaw and colleagues (Bradshaw et al., 2021) highlighted that observable social-communication differences for infants with ASD seem to unfold at nine months of life. Therefore, the second semester of the first year of life may be a critical window for targeted intervention. In this context, ERI-SIBS was developed as an innovative and ecological early recognition and intervention program designed for siblings of ASD children (Clinicaltrials.gov identifier NCT06512649).

Objectives: This study aims to analyse sensory-motor profiles during the second semester of the first year of life to detect potential early differences between high-risk (HR) and low-risk (LR) infants.

Methods: We aim to recruit 48 siblings at LR and HR for neurodevelopmental disorders. To this day, we have recruited 21 infants (age range: 6-12 months), 8 of whom are siblings of typical developing children (LR) and 13 of whom are siblings of ASD children (HR). Scores at Griffiths Scales of Child Development-3, Communication and Symbolic Behaviour Scales-Infant-Toddler Checklist (CSBS-IT-C) and Questionnaire Sensory Profile-2 (SP-2) are reported and analysed. Since the limited sample, statistical analyses were performed through a non-parametric approach.

Results: Preliminary results showed different developmental profiles in the two groups. In particular, the Mann-Whitney Test highlighted lower quotients in language and communication ($p=0.015$) and eye-hand coordination ($p=0.042$) subscales of Griffiths-3 in HR infants than in LR infants (see Figure 1). General Developmental Quotients showed different distributions and variances (HR: mean 97, SD 15.5; LR: mean 108.2, SD: 7.9), and in the HR group, 5/13 infants showed at least a sub-quotient lower than 85.

As regards CSBS-IT-C scores, the two groups also showed differences with a tendency to statistical significance in social engagement, with lower scores in HR infants in comparison to LR infants (HR: mean 8.1, SD 2.9; LR: mean 10.2, SD 1.7; HR vs LR p -value: 0.057). Finally, wider sensory dysfunctions were revealed at SP-2 in the HR group, particularly in the auditory processing.

Conclusions: Preliminary results from the ERI-SIBS project indicated different sensory-motor profiles between LR and HR infants. In particular, preverbal communication abilities and visual-motor coordination appear to be the most critical aspects at this age. This suggests that an early global assessment, including sensory-motor skills, is necessary to tailor and address early intervention for HR infants. According to these insights, ERI-SIBS provides a naturalistic early intervention that can positively impact the neurodevelopment of this population.



405.236 Distinguishing between Normal Gait and Toe-Walking Using Kinematic Data Gathered Via Openpose and Machine Learning Classifiers: A Pilot Study.

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Background: Altered gait patterns, such as toe walking (TW), are common in various clinical conditions, including Autism Spectrum Disorder (ASD), where TW affects about 20-30% of individuals. Quantification of TW can provide valuable insights into gait abnormalities and guide interventions. A recently proposed video-based coding protocol allows TW quantification in natural settings but requires manual video review by an operator. However, a markerless gait analysis system (MGAS) could address the challenges of non-acceptance in individuals with ASD or intellectual disabilities, enabling automated kinematic analysis and detection of uncommon gait patterns like toe walking with minimal operator involvement during data processing. This approach could improve the efficiency and accuracy of gait assessments in such populations.

Objectives: This study aimed to develop a novel method for detecting toe-walking using the OpenPose module.

Methods: The present study involved 10 subjects with neurotypical development (aged 4-18 years; 7 males) who simulated toe-walking and 2 individuals with ASD (age: 5 and 8,1 years; 2 males), diagnosed according to DSM-5 criteria and presenting toe-walking. All participants were administered a validated video-based coding protocol based on standardized video recordings to quantify toe-walking. The test consisted of transporting an object (e.g., puzzle, Lego®) from a therapist to a playing table located 3 meters away and back again 10 times. All tests were conducted without shoes, albeit with socks. The subjects with neurotypical development were tested once, while the individuals with ASD were tested three times on three different days (6 acquisitions), resulting in 16 tests. Sagittal-plane video recordings of the walking trials were collected based on a setup described in the literature. Using the OpenPose module, the skeletons were extracted in the sagittal plane, and gait kinematics were computed. A two-tailed T-test was applied to identify the most relevant features: we selected features at p -value test <0.05 as inputs for the classifiers. Then, these selected features were then used to train supervised neural networks (NNs) to evaluate accuracy, sensitivity, specificity, and the area under the curve (AUC).

Results: Finally, 1140 normal and 648 tip-toe gait samples were used to train three neural network classifiers. We identified 12 relevant features, summarized in Table 1. The classifiers were trained using these selected features and a leave-one-out cross-validation process, repeated 19 times. Classifier performance metrics (mean and standard deviation for accuracy, sensitivity, and specificity) were evaluated using Support Vector Machine (SVM), K-Nearest Neighbors (KNN), and Bayesian classifier, with z-score normalization. The results, summarized in Table 2, showed that the SVM classifier obtained the best results.

Conclusions: The proposed method offers the potential for automated detection and quantification of toe walking in standardized protocols and settings. This approach provides detailed kinematic data with a fully non-intrusive method, not requiring the patient's instrumentation. The following research steps will be dedicated to the study of a larger court of subjects to further validate the findings of this preliminary study.



405.237 Distinguishing between Restricted and Unusual Interests: Investigating the Role of Social Functioning and Inflexibility
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Background: Recent findings have suggested that rather than being a unidimensional construct, special interests are complex and multidimensional subdomains of restricted and repetitive behaviors (RRB). More specifically, across both factor analytic studies and qualitative studies, unusual interests (UI), or interests that are unusual in terms of their content, and restricted interests (RI), or interests distinguished by their atypical intensity or focus rather than topic or content, have emerged. Developmental accounts of special interests suggest that early emerging differences in social reward processing may lead to increased seeking out of rewarding non-social activities and interests. Although previous studies have suggested that RI and UI show distinct patterns of associations with age and cognitive functioning, potential differences in their associations with social functioning requires further investigation.

Objectives: This study focused on characterizing associations between RI and UI with distinct facets of social functioning and inflexibility. Given that UI are primarily characterized by topics/content that is specific to autism and RI primarily by difficulties regarding the ability to disengage and shift focus, we hypothesized that UI would show the strongest associations with social functioning and RI with insistence on sameness (IS).

Methods: Secondary data were utilized from a sample of 59 parents of autistic youth (mean age [SD] = 92.11 [33.51] months; 78% male), as part of a larger study conducted across three U.S. sites: Stanford University, University of Missouri, and University of Virginia. The Dimensional Assessment of Repetitive Behaviors (DARB) was employed to assess RI, UI, and IS. Social functioning was measured using the Stanford Social Dimensions Scale-2 (SSDS-2), which evaluates social motivation (SM), social affiliation (SA), expressive social-communication (ESC), and social recognition (SR). Spearman's correlational analyses explored relationships among DARB and SSDS-2 subscales, while Fisher's z-test determined the statistical significance of differences in correlation strengths. A significance level of .05 was used.

Results: Results of correlational analysis are depicted in **Figure 1**. Positive correlations were observed between IS and both RI and UI. The correlation between IS and UI was significantly stronger ($z = -2.10$, $p < .05$) than the correlation between IS and RI. IS and UI each showed negative correlations with SA, ESC, and SR, with no significant differences in the magnitudes of these correlations (all contrasts $p > .05$). Neither IS nor UI showed significant correlations with SM, while RI exhibited non-significant correlations with all SSDS-2 subscales.

Conclusions: Distinct patterns of association found for RI and UI further demonstrates the need to independently assess and characterize these constructs. IS displaying a stronger association with UI than RI may suggest that UI have a more ritualized component than RI or may reflect a stronger general association between UI (a phenomena not commonly seen outside of autism) and autistic features. Finally, SM showing no association with either RI and UI is somewhat inconsistent with the social reward processing hypothesis of special interests and indicated that further work is needed elucidate the role of specific aspects of social functioning in the development of intense interests, in particular UI.

Additional analyses will be completed as the study is ongoing and more data is being collected.



405.238 Early Gait Features Predict Later Autism Diagnosis

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Background: Motor delays are among the earliest-emerging developmental differences in children who are diagnosed with autism spectrum disorder (ASD) (West, 2019). A growing literature has demonstrated that quantitative gait measures, such as higher variability of spatiotemporal gait metrics, hold promise as novel biomarkers of ASD (Lum et al., 2021). However, no studies have prospectively assessed early gait in infants who develop ASD.

Objectives: Prospectively investigate whether objective measures of toddlers' early gait predict later ASD diagnoses and language outcomes.

Methods: The study sample consisted of 77 children (28 with an older sibling with a diagnosis of ASD and 49 with no first-degree autistic relatives). Children participated in a gait task approximately one month after they began to walk independently, during which their movements were recorded via a pressure-sensitive gait mat and a three-dimensional (3D) depth camera. Means and standard deviations of spatiotemporal gait features were extracted from gait mat data; computer vision methods were used to compute kinematic and postural features from 3D camera data (Fig. 1). Children underwent a comprehensive autism evaluation at 24 months. Hypothesis-driven logistic and linear regression models examined whether a measure of gait variability (the enhanced gait variability index; Gouelle et al., 2013) predicted later ASD diagnosis, symptom severity (CARS-2 raw score), and language ability (Bayley-4 Communication Standard Score), after statistically controlling for Bayley-4 cognitive scores at 12 months. We hypothesized that greater gait variability would be significantly associated with a higher degree of ASD symptoms and poorer language skills at 24 months. Exploratory analyses used cross-validated machine learning classifiers to predict ASD diagnostic outcomes.

Classifiers were run with four different feature sets to compare predictive utility across possible screening tools: 1) an established parent-report measure (the Autism Parent Screen for Infants; APSI), 2) gait mat features, 3) computer vision features, 4) combined gait mat & computer vision features.

Results: A total of 18 children were diagnosed with ASD. Regression models demonstrated that greater gait variability was associated with more ASD symptoms ($\beta = 0.02, p = 0.04$) and marginally significantly associated with a higher likelihood of receiving an ASD diagnosis ($\beta = 0.09, p = 0.06$). Gait variability was not associated with later language outcomes ($\beta = -0.22, p = 0.45$). Exploratory findings demonstrated that classifiers trained on computer vision features alone achieved the highest prediction accuracy (77%), compared to classification based on gait mat features (65%), combined motor features (72%), and the APSI (62%). See Table 1 for additional performance metrics for all feature sets.

Conclusions: This study is the first to prospectively investigate whether early gait features are associated with later clinical outcomes in autistic children. Findings indicate that gait variability is significantly and specifically associated with ASD symptom severity but not language outcomes. Classifiers trained on motor features not only predicted later ASD diagnoses with high accuracy, but outperformed prediction based on an established screening tool designed to assess for early signs of ASD. Results support the conclusion that motor differences hold potential to enhance screening and early detection of ASD.



405.239 Ecological Momentary Assessment: A Novel Tool for Assessing Rrbs and Their Relationship with Adaptive Functioning
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Background:

Restricted and repetitive behaviors (RRBs) represent a heterogeneous group of behaviors, ranging from repetitive motor movements and speech to persistent rituals and preoccupation with intense and fixed interests. These vary from person to person and their presentation can change within individuals across time and contexts (Lombardo et al., 2019). The literature shows inconsistent findings regarding the relationship between RRBs and adaptive functioning, partially due to our inability to accurately assess these traits.

Researchers and autistic self-advocates have long expressed concerns regarding the state of assessment of autistic traits, including challenges related to content and ecological validity (e.g., Sturm et al., 2017). RRBs have proven particularly difficult to reliably and validly measure (e.g., Uljarević, 2021). Most studies rely on observational measures of autism symptomatology, which largely skew toward criterion A of the DSM, impairment in social communication and interaction. Such measures (e.g., ADOS) produce a single score intended to capture all RRBs, ignoring the variable nature of this symptom class (Ozonoff et al., 2005). An ecological momentary assessment (EMA) of RRBs could serve to capture the multidimensionality of RRBs and more accurately characterize the way in which they manifest in different contexts in the child's daily life. This framework would allow to examine how specific RRBs associate with functional outcomes in the context of a specific child and his/her environment, allowing for the differentiation of adaptive from maladaptive RRBs in a subjective fashion.

Objectives:

(1) To establish the feasibility of the EMA of RRBs. (2) To examine the association between RRB subtypes, as measured through EMA, and adaptive functioning in a subjective manner.

Methods:

Participants are parents of autistic children aged 3-6. Through a novel mobile EMA platform developed by the Computerized Neuroscience Laboratory at the Hebrew University (Yitzhak et al., 2023; Nahum et al., 2023), participants will report on the frequency of six subtypes of RRBs twice daily for a period of two weeks. Participants will also report on child adaptive functioning (ABAS-3; Harrison & Oakland, 2015). Hierarchical linear modeling will be used to examine patterns of association between RRB subtypes and adaptive functioning.

Results:

Preliminary analyses from 8 participants (2 females; mean age = 50±9.7 months) show feasibility for the EMA tool, pointing to high completion rates (mean = 86.5% ± 24.3, range = 50-100%) and time efficiency (mean time to complete per EMA entry = 3.8 min). The EMA data reveals a unique RRB profile for each child, and comparison of EMA data to retrospective parent-report measure (i.e., RBS-R; Bodfish et al., 1999) shows that EMA provides a distinct perspective on RRB expression (see Figures below). Data collection is ongoing and future analyses with a larger sample will examine associations of RRB subtypes and adaptive functioning.

Conclusions:

EMA is a feasible framework for measuring RRBs, which may more accurately depict naturalistic RRB phenotypes than single timepoint retrospective reporting. Through this framework, we can examine how specific RRBs associate with functional outcomes in the context of a specific child, operationalizing a way to distinguish adaptive from maladaptive RRBs.



405.240 Elevated Heart Rate Reactivity during Unanticipated Acoustic Startle in Autistic Children

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Background: Autistic children demonstrate both sensory and emotional differences, such as auditory hyper-reactivity and challenges with emotion regulation, which can have a significant impact on everyday functioning and quality of life. Previous studies have mostly examined sensory and emotional differences in autism independently, using diverging methods. Autonomic nervous system differences have also been sporadically reported in autistic people, and may relate to sensory and emotional differences, but have not been comprehensively investigated in either sensory or emotional paradigms.

Objectives: The present study aimed to examine differences in baseline unanticipated acoustic startle, an involuntary reaction that lies at the intersection of emotion and reflex, in autistic and neurotypical children, using heart rate reactivity and self-reported emotional experience.

Methods: We investigated heart rate reactivity and subjective emotional experience in response to a 100 ms, 105 dB unanticipated acoustic startle stimulus in 27 autistic children (4 female, 23 male) and 31 neurotypical children (15 female, 16 male). Participants were aged 7 to 14, and groups were matched on age, body mass index (BMI), nonverbal reasoning, and time of testing (AM/PM). Inter-beat interval (IBI) reactivity was computed as a measure of heart rate reactivity immediately following the stimulus (0-10 seconds) and during a recovery period (11-60 seconds), by subtracting IBI during these periods from resting IBI. After the recovery period, participants were asked to report their experience of 11 discrete emotions on a three-point scale from 0 (not at all) to 2 (a lot), which were summed to obtain a total emotional experience score. All analyses controlled for sex.

Results: All participants demonstrated similar resting IBI and similar changes in IBI immediately following the startle stimulus, $B = 14.42$, $t = 0.44$, $p = .437$, Adjusted $R^2 = -.027$, $f^2 = -.013$. Throughout the recovery period, however, autistic children maintained lower IBI, indicating faster heart rate, than neurotypical children, $B = 38.86$, $t = 2.14$, $p = .038$, $R^2 = -.027$, $f^2 = -.089$. Autistic children also reported greater total emotional experience than neurotypical children, $B = -1.43$, $t = 0.70$, $p = .047$, Adjusted $R^2 = .114$, $f^2 = -.080$.

Conclusions: Findings suggest that autistic children experience prolonged heart rate recovery and greater subjective emotional experience in response to an unanticipated acoustic startle stimulus. Such differences in autonomic nervous system reactivity and subjective experience may underlie the sensory hyper-reactivity and emotion regulation challenges autistic people experience. Moreover, the findings demonstrate the utility of multi-modal approaches for studying the emotional and sensory features of autism.

405.241 Elucidation of the Relationship between Sleep Disturbance and Sensory Characteristics Leading to Behavioral Problems in Children with Autism Spectrum Disorder

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Background:

Children with autism spectrum disorder (ASD) (70–95%) have atypical sensory processing. Atypical sensory processing, especially sensory seeking, is strongly associated with maladaptive behaviors related to antisocial behaviors and caregiver strain. ASD is known to complicate sleep disturbances in up to 80% of patients and exacerbate behavioral problems. The identified causative genes for ASD with sensory features, including *CHD8*, *SCN2A*, and *SYNGAP1*, are known to be involved in sleep disturbances, suggesting an innate link between sensory and sleep profiles in children with ASD. Although a proper understanding of the relationship between sleep and sensation may reduce behavioral problems, the results of previous studies have been inconsistent owing to a lack of detailed information on sleep and sensation profiles.

Objectives:

The objective of our study was to clarify the relationship between sleep and sensory characteristics to reduce behavioral problems in children with ASD.

Methods:

Between March 2023 and March 2024, we asked parents of children with ASD aged 3–6 years to complete online questionnaires (the Japanese Sleep Questionnaire for Preschoolers [JSQ-P], the Autism-Spectrum Quotient, the Eyberg Child Behavior Inventory [ECBI], and sensory questionnaires, which provide three categories (hypersensitivity, hyporesponsiveness, and sensory seeking) for each of the seven sensory dimensions: auditory, visual, tactile, proprioceptive, vestibular, gustatory and oral, and olfactory. Parental consent was obtained electronically, and ethical approval for this study was obtained from Gifu University (approval number: 27-230).

Results:

A total of 122 boys (73.5%) and 44 girls participated in the study; 96.4% of the respondents were mothers. The mean age of the participants was 63.0±11 months, and 98 (59%) participants had behavioral problems, as assessed by the ECBI intensity scales. Welch's t-test showed that the group with behavioral problems had a significantly higher JSQ-P total score ($t[157]=8.52, p<.001$) than the group without behavioral problems. Parasomnia ($t[158]=4.27, p<.001*$) and insomnia or circadian rhythm disorders ($t[159]=6.77, p<.001*$) were sleep disturbance-related factors that were significantly higher in the group with behavioral problems. None of the lifestyle factors, such as screen time, starting time of dinner and bath, or bedtime, showed significant differences ($p>.05$). Correlation analysis revealed significant correlations between behavioral problems and sleep problems ($r=0.60, p<.001*$), hypersensitivity ($r=0.43, p<.001*$), hyporesponsiveness ($r=0.33, p<.001*$), and sensory seeking ($r=0.51, p<.001*$). Correlations exist between sensations and sleep disturbances, as well as between sensory factors. Partial correlation analysis using sensory scores as a control variable revealed a significant correlation between sleep disturbances and behavioral problems ($r_p=0.46, <.001*$) (Fig. 1).

Conclusions:

A strong positive correlation exists between sleep disturbance and behavioral problems in children with ASD. The group with behavioral problems had significantly higher scores on all seven sensory dimensions. Nevertheless, assuming spurious correlations due to sleep disturbances, only sensory seeking was significantly correlated with behavioral problems, and hypersensitivity was not directly responsible for the behavioral problems. Focusing on sensory seeking and satisfying their need for sensory seeking may improve sleep status and reduce behavioral problems in children with ASD.

**405.242** Emotion Regulation and Family Accommodation in Autism

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Background:

Emotion regulation (ER) refers to the processes by which individuals influence which emotions they have, when they have them, and how they experience and express them (Kooze et al., 2011; Gross, 1998). Recent research supports a relationship between RRBs and emotion regulation difficulties in autism, specifically self-injurious RRBs, which were found to be the best predictors of ER (Martínez-González et al., 2022). Parental ER is also associated with the child's ER and externalizing problems (Ting & Weiss., 2017).

Family accommodation (FA) refers to proactive modifications made by family members intended to decrease their child's distress, which stems from the child's psychopathology. FA of RRBs has been preliminarily documented, with elevated FA being associated with elevated RRB severity, reduced adaptive functioning, and increased disruptive behavior and parenting stress (Feldman et al., 2019; Koller et al., 2021).

The association between child and parent ER and FA of RRBs has yet to be examined.

Objectives:

To examine the cross-sectional presence and nature of the association between child and parent ER and FA among families of young autistic children.

Methods:

Participants were 133 children, (mean age 38.9 months; 94 males) with suspected autism and their parents. Based on a gold-standard evaluation including measures of child development (Mullen, 1995) and autism symptomatology (ADOS-2; Lord et al., 2000; RBS-R; Bodfish et al., 2000), three groups were generated: 88 autistic children, 28 characterized as having developmental delays (DD; based on at least one Mullen scale ≥ 2 SD below the mean or at least two scales ≥ 1.5 SD below the mean; Ozonoff et al., 2014), and 23 children who did not receive a diagnosis and did not display any DDs.

Parents completed several questionnaires regarding child ER (CBQ; Rothbart et al., 2001), parental ER (ERQ; Gross et al., 2003), and accommodation (FAS-RRB, Feldman et al., 2019).

Results:

Spearman's correlations between the study variables found that family accommodation (FA) indices positively and significantly associated with child negative affect ($r(82) = .41-.50$), with no significant differences between groups. Additionally, among autistic children, FA positively associated with child surgency ($r(82) = .24-.28$).

Regarding FA and parental ER (ERQ), the lone significant finding points to a positive correlation between maternal accommodation of children's RRBs with maternal expressive suppression ($r(43) = .37, p < .007$) among mothers of autistic children.

Conclusions:

This study is the first to shed light on the relationship between ER and FA of RRBs. Results show a positive correlation between negative affect and FA, meaning that when a child presents more negative emotions, there are likely to be more accommodating behaviors. Within the autistic group, there are further connections between accommodation and ER. When considering factors subsumed by child surgency, impulsiveness and high activity level are associated with increased accommodation. Additionally, mothers who tend to conceal emotion-expressive behavior tend to accommodate more. A longitudinal examination of the interaction between these constructs is necessary in order to gauge their clinical significance.

405.243 Examining Object Play Initiation Delays during ADOS-2 Make-Believe Play Task

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Background: Autism Spectrum Disorder (ASD) is often associated with Restrictive and Repetitive Behaviors (RRB), which include restricted interactions with objects. Object play, a crucial aspect of children's development, offers insights into the sensory and motor processes underlying these behaviors. This study explores whether children with ASD exhibit delays in initiating interactions with objects, potentially due to factors such as increased inspection time or sensory processing differences, which shape how children with ASD perceive and respond to their surroundings.

Objectives: This study analyzes the differences in time taken to start interactions with objects between ASD and non-ASD children during the ADOS-2 Module 3 Make-Believe Play task. The objectives are to: (1) compare the time taken to initiate a touch contact with an object between ASD and non-ASD children; (2) compare the time taken to initiate a play behavior with an object between ASD and non-ASD children; (3) assess whether initiating touch is likely to lead to subsequent play; and (4) evaluate differences in the total number of objects interacted with by each group.

Methods: This study included 79 children (49 male, 30 female; mean age: 8.7 ± 1.9 years), with 41 diagnosed with ASD and 38 non-ASD, from ADOS-2 session recordings from a combined dataset from clinics in the US and Qatar. Time intervals between the initial touch and the onset of play were separately annotated for all videos by three annotators.

Results: Children with ASD took longer on average to initiate play behaviors compared to non-ASD children (ASD median = 17 seconds, IQR = 26; non-ASD median = 7 seconds, IQR = 11; $p = 0.0009$), indicating a notable difference in how quickly each group engaged with objects. A similar pattern was observed with touch initiation times (ASD median = 12 seconds, IQR = 20; non-ASD median = 7 seconds, IQR = 10.5; $p = 0.0028$).

In non-ASD children, touch often led to play quickly, with an average transition time of 1.4 seconds, in comparison to the longer ASD average transition time of 4.8 seconds. There was no significant difference between the groups in the total number of objects interacted with (ASD mean = 7.2 objects, SD = 3.5; non-ASD mean = 8.4 objects, SD = 4.5; $p = 0.29$).

Conclusions: This study highlights differences in the timing of object interactions between ASD and non-ASD children during the ADOS-2 Make-Believe Play task. The findings reveal that children with ASD require more time on average to initiate both touch and play interactions with objects, suggesting potential delays in sensory processing or decision-making during object engagement. The longer transition times from touch to play in the ASD group compared to non-ASD children, further support the idea that ASD children may experience additional cognitive or sensory demands before engaging fully in play. Despite these timing differences, both groups interacted with a similar number of objects. These findings offer insights into the ways that children with ASD interact with their surroundings, emphasizing the importance of considering timing and transition patterns in the assessment of play behaviors.

405.244 Experimental Manipulation of Sensory Processing in Electroencephalography and Pupillometry

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Background:

Sensory symptoms are often reported by autistic individuals (ASD). Different cortical processing of sensory information is discussed as an underlying neurophysiological mechanism. The locus coeruleus (LC) has been established to modulate sensory processing via tonic and phasic norepinephrine (NE) release.

Objectives:

We explored the effect of a non-invasive, experimental manipulation of LC-NE activity on sensory processing in autistic and non-autistic adolescents.

Methods:

We combined pupillometry and electroencephalography (EEG) during a passive auditory oddball task to concurrently assess LC-NE activity and sensory processing. Baseline pupil size (BPS) and stimulus-evoked pupillary response (SEPR) indexed tonic and phasic LC-NE activity, respectively. In line with previous studies, mismatch negativity (MMN) and P3a amplitude were used as measures of sensory processing. The oddball task consisted of a sequence of frequent (standard) or infrequent (oddball) pure tones (500 versus 750 Hz). The oddball task included a handgrip exercise as an experimental manipulation of LC-NE activity. The handgrip exercise required participants to repeatedly press a handgrip as hard as possible. This manipulation was applied in a within-subject design between blocks of the oddball tasks. The sample consisted of 46 autistic adolescents (ASD), 52 healthy controls (CON) and 31 adolescents with mental health condition including ADHD, anxiety and depression (mental health conditions = MHC). Manipulation effects and group differences were analyzed using linear mixed-effects models on subject and on single-trial level.

Results:

On a subject and per-trial level, oddball tones evoked an increased amplitude of SEPR, MMN and P3a compared to standard tones. After the manipulation, SEPR, MMN and P3a were increased in response to oddballs ($bs = 0.20-0.28$). These manipulation effects last about 5 min. In addition, ASD and MHC compared to CON showed a higher BPS after manipulation ($bs = 0.10-0.14$). In ASD, the manipulation led to a positive association of BPS and P3a amplitude ($b = 0.06$ [0.01, 0.10]).

Conclusions:

Our findings confirm conceptualizations of LC as a neuromodulator of sensory processing. The handgrip exercise had a temporarily enhancing effect on LC-NE activity and sensory processing measures. A group-specific manipulation effect was found for tonic LC-NE activity in the autistic adolescents and individuals with mental health condition. In these individuals, the manipulation increased LC-NE tonic activity, which could be interpreted as compensatory arousal. In the autistic adolescents, this increased LC-NE tonic activity specifically improved sensory processing of oddballs on a neurophysiological level as indicated by the association of BPS and P3a amplitudes after the manipulation. Together, findings further characterize potential neurophysiological mechanisms of different sensory processing in neurodiversity, which could be manipulated by increased LC-NE tonic activity.

405.245 Exploring Gender Differences in Emotional Outbursts Triggered By Sensory Stimuli in Latino Youths

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Background:

Autism Spectrum Disorder (ASD) is a neurodevelopmental condition characterized by challenges in social communication, repetitive behaviors, and sensory processing differences. For autistic individuals, emotional dysregulation (ED) can be prevalent, persistent, and clinically significant, contributing to potential functional impairment (Davico et al., 2022). Intense emotional reactions can lead to emotional outbursts (EO) as individuals struggle to cope with overwhelming emotions in unpredictable or overstimulating environments. EOs in individuals with ASD can stem from various triggers. Research has shown that atypical sensory processing patterns in children with ASD are closely linked to emotional and behavioral challenges (Sakamoto et al., 2024), underscoring the importance of investigating how certain sensory sensitivities may contribute to emotional dysregulation.

Moreover, there may be significant sex differences in how sensory triggers affect emotional regulation in autistic individuals, with autistic females often experiencing more severe sensory processing difficulties than males, particularly in areas such as hearing and balance/motion (Osorio et al., 2021).

Objectives:

This study aimed to examine sex differences in the frequency of emotional outbursts triggered by specific sensory stimuli (i.e., touch, smell, noise, temperature) among autistic Latino children and adolescents (ages 6-18).

Methods:

Caregivers of 120 autistic youths aged 6 to 18 years ($x=10.35$, $SD=2.43$) residents of the Rio Grande Valley region in South Texas completed the Emotional Outbursts Questionnaire. This study is part of a larger multisite study comprising samples from seven countries of the Latin American Network for Autism (REAL): Argentina, Brazil, Chile, the Dominican Republic, Uruguay, USA and Venezuela. Descriptive data analysis included frequencies and central tendency analysis, and chi-square tests were performed to establish sex differences across variables.

Results:

There was a higher number of females (59%, $n=71$) than males (41%, $n=49$). In terms of the different sensory triggers, the most common one was temperature too hot or too cold (81.7%, $n=98$), followed by light and smell (80.8%, $n=97$). Emotional outburst triggered by temperature (64.8 %, $n=46$), light (73.2%, $n=52$), smell (61.9%, $n=44$) and tact (80%, $n=52$) were more frequent in females without reaching statistical significance. Those triggered by loud noises did not show differences between sexes.

Conclusions:

The findings indicate no significant sex differences in the frequency of EOs triggered by sensory inputs such as touch, sound, temperature, and smell. This suggests that sex did not play a substantial role in emotional outbursts in response to sensory stimuli in this autistic population, despite a higher number of female participants than males. These findings are consistent with previous literature. A potential explanation may be the subtlety of sensory processing differences between sexes, with females often exhibiting less overt sensory symptoms (Edwards et al., 2024). Additionally, the discrepancy between behavior and sensory experiences may explain why EOs did not differ by sex, despite some reports of heightened sensitivity. Future research should further investigate how sensory processing manifests across sexes, including potential biomarkers, to develop more personalized interventions (Asaridou et al., 2022). Additionally, exploring other variables, such as cultural or developmental factors, could enhance our understanding of emotional regulation in autistic individuals.

405.246 Exploring Sensory Processing Patterns in Autistic Children with Co-Occurring ADHD and Anxiety: Links to Emotional Reactivity and Neural Measures

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Background: Heterogeneity among autistic individuals poses challenges to early identification and intervention development. A significant contributor to this heterogeneity is co-occurring conditions, particularly anxiety and ADHD, which affect 40-60% of autistic children. Autism, ADHD, and anxiety share unique and common neural and behavioral features, with sensory processing differences being a key area of overlap. These shared characteristics can delay diagnosis and worsen other challenging behaviors, such as emotional reactivity, necessitating transdiagnostic approaches to better understand shared and distinct behavioral patterns across these conditions.

Objectives: This study aims to (1) examine sensory processing differences in autistic children with and without co-occurring ADHD and/or anxiety, (2) explore the relationship between sensory processing and emotional reactivity, and (3) assess the relationship between sensory processing and visual evoked potentials (VEP), a neurophysiological measure of cortical excitation/inhibition balance.

Methods: Ninety-two autistic children aged 4-8 years [29% female; 24% non-white] were divided into four groups: autistic ($n=22$), autistic with co-occurring ADHD (AuADHD; $n=21$), autistic with co-occurring anxiety (AuAnx; $n=19$), and autistic with co-occurring ADHD and anxiety (AuADHDAnx; $n=30$). Sensory hyperreactivity and hyporeactivity measured using the Sensory Experiences Questionnaire. Emotional reactivity was assessed via the Emotion Dysregulation Index. VEP data were collected from a subset of participants ($n=48$) using black-and-white checkerboard stimuli with phase reversal. The N1 and P1 midline occipital amplitude and latency were analyzed. Group differences and correlations between sensory processing, emotional reactivity, and VEP were examined using general linear models.

Results: Significant group differences were found in both sensory hyperresponsivity ($F(3)=5.7, p<.01$) and hyporesponsivity ($F(3)=5.5, p<.01$). Sensory hyperresponsivity was associated more with co-occurring anxiety; AuAnx children exhibited higher levels of sensory hyperresponsivity compared to autistic children alone ($t=2.3, p<.05$), while AuADHDAnx children had higher hyperresponsivity than both autistic children ($t=4.1, p<.001$) and AuADHD children ($t=2.3, p<.05$). Sensory hyporesponsivity was linked more to ADHD, with AuADHD children showing higher hyporesponsivity than AuAnx children ($t=2.2, p<.05$), and AuADHDAnx children showing higher hyporesponsivity than both autistic children ($t=3.2, p<.01$) and AuAnx children ($t=3.5, p<.001$). Sensory hyperresponsivity also significantly moderated the relationship between diagnostic group and emotional reactivity ($F(4)=4.4, p<.01$), with the strongest effect seen in AuAnx children. No significant effect was found for hyporesponsivity. Although VEP P1 latency or amplitude was not associated with sensory features, there was a correlation between sensory hyperresponsivity and N1 latency ($r(46)=-.34, p<.05$).

Conclusions: This study highlights distinct sensory patterns in autistic individuals with co-occurring anxiety and/or ADHD. Sensory hyperresponsivity appears related more to anxiety, while sensory hyporesponsivity is linked to ADHD. The connection between sensory hyperresponsivity and emotional reactivity was strongest in AuAnx children, suggesting that anxiety may heighten the impact of sensory sensitivities on emotional responses. Preliminary findings also suggest a potential link between VEP and sensory processing patterns. Overall, these findings highlight the need to understand how sensory processing differences affect autistic individuals with various co-occurring conditions, supporting the integration of sensory processing considerations in intervention planning. Furthermore, the VEP may serve as a promising biomarker for evaluating treatment efficacy in studies addressing sensory processing in autistic children.

405.247 Exploring the Multiple Facets of Interoception and Anxiety in Autism

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Background: Sensory processing differences may impact the prevalence and presentation of anxiety in autistic individuals. This includes the sense of interoception, i.e., how we perceive sensory information from within our bodies. Autistic individuals report various challenges with sensing and interpreting their bodily signals. Interventions that focus on increasing interoceptive accuracy have shown preliminary efficacy in reducing autistic individuals' anxiety. However, most prior work has just focused on one interoceptive sub-modality (cardiac), and on lower-level processing of signals (e.g., heartbeats) rather than higher-level features (e.g., heart rate). Thus, we aimed to expand the understanding of how different aspects of interoceptive perception relate to confusion in interpreting bodily states (interoceptive confusion) as well as trait anxiety.

Objectives: We analyzed how different features of interoception relate to anxiety in autistic and non-autistic individuals, across a wide age range and variety of tasks.

Methods: Our sample included $n=43$ non-autistic (ages 8-55 years, 60% female, 2% non-binary) and $n=83$ autistic individuals (ages 8-51 years, 32% female, 6% non-binary, 5% with $IQ < 70$). Interoceptive discrimination and integration were measured using three tasks with different stimulus modalities and time scales: two cardiac tasks focused on different time scales (heartbeat (HBD) and heart rate discrimination (HRD; Legrand et al., 2022)) and a respiratory integration task (Walsh et al., 2019). Participants completed one survey to characterize interoceptive confusion, the Interoception Sensory Questionnaire (ISQ), and two anxiety scales: the Anxiety Scale for Children (or Adults) with ASD and the Screen for Child (or Adult) Anxiety Related Disorders. We used a principal component decomposition to compare shared versus distinct features captured by questionnaire measures. Then, we used a general linear model to analyze group by task relationships with the resulting component scores, controlling for age.

Results: We found two separable components of interoceptive confusion and anxiety: one anxiety-linked component in which greater interoceptive confusion closely correlates with higher anxiety and one anxiety-independent component, in which individuals may have higher interoceptive confusion without higher anxiety levels. Though results were inconclusive statistically, there were some trends that may point towards task- and group- specific relationships. Imprecise heart rate discrimination was related to higher anxiety in the non-autistic group, whereas precise discrimination related to higher anxiety in the autistic group (Group x HRD interaction, $t=1.54$, $p=0.127$). Of the three tasks, an increased ability to successfully map visual and respiratory information in the respiration task most closely related to anxiety-independent interoceptive confusion ($t=-1.55$, $p=0.125$).

Conclusions: These findings suggest that cardiac versus respiratory interoception may differentially relate to anxiety levels, such that precise cardiac interoception may be a marker of higher anxiety in autistic but not non-autistic individuals. On the other hand, respiratory interoception may be a transdiagnostic marker of anxiety-independent interoceptive difficulties. Further work is needed to clarify these relationships, including relations with broader participant features than examined here. Overall, it may be useful to combine performance across multiple tasks to determine which individuals may benefit from targeting simple detection of their bodily signals versus the broader contextualization and meaning of their interoceptive signals.



405.248 Exploring the Survey of Favorite Interests in Autism (SOFIA) in Autistic Preschoolers

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Background:

Autistic individuals often have favorite interests across their lifespan. Although these interests are conventionally associated with impairments, some studies and first person-perspectives attest to potential benefits of favorite interests (e.g., Winter-Messiers et al., 2007). Smerbeck (2019) introduced the Survey of Favorite Interests in Autism (SOFIA) to examine parent-reported benefits/difficulties associated with children's favorite interests. The SOFIA was validated on a sample of autistic children ages 6-17 years. Results suggested that a five-scale structure – Social Flexibility, Perseveration, Respondent Discomfort, Adaptive Coping, Atypicality – best fit the data. Scores were meaningfully associated with participant characteristics, including autism features and adaptive skills (Smerbeck, 2019). To our knowledge, the SOFIA has not yet been applied to early development (i.e., preschool years), when favorite interests often emerge in autistic and nonautistic children.

Objectives:

This study employs the SOFIA in a younger sample of autistic children. This will advance our understanding of (1) how suitable this tool is for preschoolers and (2) how parents of young children with autism perceive the strengths and challenges associated with their children's favorite interests.

Methods:

English-speaking autistic children (36-71.9 months) completed an online study about language development. Parents completed the SOFIA, Social Communication Questionnaire (SCQ, Rutter et al., 2003), Vineland Scales of Early Learning (VABS, Sparrow et al., 2016) and the MacArthur-Bates Communicative Development Inventory III (MBCDI, Fenson et al., 2003). Preliminary analyses include 60 autistic children (48 male, 12 female; $M=58\text{mos}$, $SD=7.66\text{mos}$). Expressive vocabulary skills were heterogeneous (MBCDI III: $M=45.7$, $SD=37.8$, range=0-100).

Results:

Analyses followed the structure of Smerbeck (2019). The five-factor scale structure in the current sample yielded similar Cronbach's α coefficients to Smerbeck (2019), except for the Respondent Discomfort scale, which was much lower (.58) than in Smerbeck's report (.87) (Table 1). However, scale intercorrelations were markedly different than in Smerbeck (2019), with the only overlap being a significant correlation between the Atypicality and Respondent Discomfort scales (Table 2). Finally, we replicated a significant correlation between autism symptoms (per the SCQ) and the Social Flexibility scale, as well as significant correlations between adaptive skills (per the Vineland Adaptive Behavior Composite) and the Social Flexibility and Adaptive Coping scales. Some associations found in these preliminary analyses, including higher flexibility scores in children with higher autism symptoms and higher levels of atypicality in children with higher adaptive scores, are unexpected and require further exploration.

Conclusions:

These results attest to the SOFIA's usefulness in autistic preschoolers. The internal consistency of the scales appeared generally robust, although the associations between the SOFIA scales diverged from the original validation sample. Participant characteristics were associated with scale scores: children with more autism features showed lower coping associated with special interests, and children with higher adaptive skills showed greater flexibility and coping associated with special interests. Planned analyses will further examine the role of children's developmental and language level. Overall, parents reported varied perspectives on special interests in autistic preschoolers, and the SOFIA may be a useful tool for this population.



405.249 Factors Related to Self- and Caregiver-Reported Quality of Life in Autistic Children

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Background:

Quality of life (QoL) is a key outcome identified by autistic individuals (Benevides et al., 2020) and federal agencies (IACC, 2023). Despite discrepancies between self- and caregiver-reported QoL (Egilson et al., 2017; Stokes et al., 2017), studies regularly focus on caregiver-reported QoL and its predictors, not self-reported QoL. We do not yet have a clear understanding of what factors, such as a child's sensory, autistic, or ADHD features and age, predict self-reported QoL, which is important for understanding possible mechanisms by which to enhance self-perceived quality of life in autistic children.

Objectives:

To determine how age, IQ, autism features, ADHD features, sleep difficulties, and sensory features relate to QoL depending on the reporter.

Methods:

This study consisted of 59 autistic children (5.3-10.9 years-old), 25% female, IQ 47-147, mean= 97.4). Children needed to understand English. Children completed IQ testing and caregivers completed measures regarding their child's autism features, ADHD features, sleep difficulties, and sensory features. Both children and their caregivers completed the Pediatric Quality of Life Inventory, Version 4.0. To evaluate level of agreement, we used intraclass correlation coefficients. To determine how individual variables related to QoL based on reporter, we used linear mixed-effects regression.

Results:

We found poor agreement ($ICC = 0.10$, $p = .22$) between self- and caregiver-reported QoL. Age and IQ did not relate to QoL, regardless of reporter. Autism and ADHD features demonstrated large-sized distinct relations for self- and caregiver-reported QoL, $p < .001$, $d = 1.01$, respectively, and sleep difficulties demonstrated medium-sized distinct relations for self- and caregiver reported QoL, $p = .02$, $d = 0.61$. Follow-up correlations showed that these interaction effects represented stronger relations for caregiver-reported QoL than self-reported. Only sensory features related to both self- and caregiver-reported QoL, $p < .001$, $d = 1.11$. These results were consistent across our full sample and in follow-up sensitivity analyses of participants who used spoken language and participants with IQ scores above 70.

Conclusions:

This study highlights the importance of including both self- and caregiver reports when assessing the QoL of autistic children, as these likely provide distinct and complementary sources of evidence. Like previous research (De Vries & Geurts, 2015; Leader, Dooley, et al., 2021), age and IQ were not predictors of either caregiver- or self-reported QoL. Whereas sleep quality, autistic and ADHD features were found to be only important to caregiver-reported QoL, sensory features were important to QoL for both reporters. Processing sensory information is important for many of the activities included as part of QoL measures, like play or classroom activities. Focusing on supporting the sensory features of autistic children could promote QoL from the perspective of both the child and their caregiver.

405.250 Functional Connectivity Alterations Associated with Restricted, Repetitive Behaviors in Children with Autism: An MVPA Analysis

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Background:

Despite being diagnostic symptoms for autism spectrum disorder, the neurocircuitry underlying restricted, repetitive behaviors (RRB) remains poorly understood. These behaviors have received less study than social symptoms, and treatment development has been limited. Multivariate pattern analysis (MVPA) is a powerful, data-driven analytic approach capable of detecting altered functional connectivity patterns. This approach has rarely been applied to ASD data and holds great promise for uncovering new associations. We examined the functional connectivity differences associated with RRB clinical measures in children with ASD, as well as functional connectivity associated with different RRB subtypes to determine if subtypes reflect unique neurocircuitry alterations.

Objectives:

Determine functional network alterations associated with RRB in ASD.

Determine if different subtypes of RRB exhibit functional connectivity differences.

Methods:

We used an MVPA approach and fMRI data to examine the functional connectivity relationships associated with Repetitive Behavior Score-Revised (RBS-R) total and subtype scores in an existing all-male dataset including 85 children (43 ASD) aged 5-13 years. MRI images were preprocessed and analyzed in CONN toolbox version 22a. To identify functional network alterations associated with RRB, we conducted an MVPA to decompose the functional connectivity patterns across all subjects into 8 components. Significant clusters for each RBS-R score were then identified using an omnibus F test across all MVPA components in combination with general linear models. Mean-corrected age and performance IQ (PIQ) were included in models as nuisance covariates. Subsequent posthoc seed to voxel analyses were then performed using each significant MVPA cluster as a seed. All analyses were run using Threshold Free Cluster Enhancement with 1000 permutations and a significance threshold of family-wise error corrected p values (p-FWE) < 0.05.

Results:

After correcting for mean-centered age and PIQ, whole-brain MVPA identified 7 significant clusters associated with RBS-R stereotypy subscores. Subsequent seed to voxel analyses revealed high stereotypy scores were associated with high connectivity between anterior default mode network (DMN) regions and a large number of regions encompassing much of the brain. High stereotypy was also associated with increased connectivity between a cluster in the subcallosal cortex and left nucleus accumbens with visual, dorsal attention network, and DMN regions. Stereotypy was also correlated with increased connectivity between the right frontal pole and visual and cerebellar regions, as well as reduced connectivity of the lingual gyrus with other visual regions and the motor cerebellum. MVPA analysis identified 11 clusters with significant associations with compulsive RBS-R subscores, all of which were in visual or cerebellar regions. High compulsive scores were associated with altered connectivity between these clusters and brain regions in a wide variety of functional networks suggesting compulsive behavior may be linked to altered visual and cerebellar network connectivity more generally.

Conclusions:

1. Stereotypy was associated with altered functional connectivity in the anterior DMN, right frontal pole, subcallosal cortex/nucleus accumbens, left cerebellar Crus I, and visual regions.
2. Compulsive behavior was associated with altered visual and cerebellar connectivity.
3. Stereotypy and compulsive subtypes of repetitive behavior exhibit both shared and unique connectivity alterations.

405.251 Identifying Gait Differences in Autistic and Non-Autistic Children Using 2D Video Analysis of Kinematic Parameters

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Background: Studies investigating gait deviations in autistic children compared to non-autistic children have identified several significant differences (Weiss et al., 2013; Nobile et al., 2011; Vilensky et al., 1981). While 3D motion capture is considered the gold standard for gait analysis, its cost and complexity limit its widespread use.

Objectives: The main objective of this study is to evaluate whether 2D video-based analysis can reliably differentiate between the gait patterns of autistic and non-autistic children. Specifically, the study seeks to identify which kinematic parameters exhibit significant differences and how these parameters align with results from 3D motion capture studies.

Methods: This study involves 16 children formally diagnosed with autism spectrum disorder and 30 non-autistic children, aged 5 to 12 years. Gait data was collected in a controlled clinical setting using a 2D video recording system, capturing side and frontal views with two cameras positioned to capture the full body in motion while participants walked at a self-selected pace. Participants were instructed to walk naturally, and each child completed a minimum of three trials to ensure sufficient data quality. The videos were processed using OpenPose, an open-source tool that identifies and tracks key joint points, hips and knees. Two kinematic parameters- Hip Abduction-Adduction, Knee Abduction-Adduction, were selected for comparison between the autistic and non-autistic groups. T-tests were used to compare the parameters, with Bonferroni corrections applied for multiple comparisons. A power analysis was conducted to confirm adequate sample sizes for detecting significant differences. The results obtained from the 2D video analysis were then compared to literature using 3D motion capture. This comparison allowed for an evaluation of the accuracy and limitations of the 2D method, providing insight into the feasibility of using 2D video analysis as a cost-effective and accessible tool for identifying gait differences in autistic children.

Results: Preliminary findings indicate knee abduction-adduction on the right side showed a near-significant trend, with a T-statistic of 1.867695 and a P-value of 0.07189, suggesting that knee joint motion may play an important role in gait differences in autistic children. Although this result did not reach conventional significance ($P < 0.05$), it warrants further investigation. Hip abduction-adduction, both on the left and right, did not show statistically significant differences, with P-values of 0.088018 and 0.188633, respectively.

Conclusions: This study demonstrates that 2D video-based gait analysis is a promising tool for distinguishing gait patterns between autistic and non-autistic children. Although it does not fully replicate the precision of 3D motion capture, it offers a more accessible and cost-effective alternative for early gait screening in both clinical and research environments. Further analysis is required to investigate additional kinematic parameters, which will help refine the accuracy and broaden the potential applications of 2D video-based analysis.

405.252 Impact of Visual Stimulus Dynamics on Visual-Motor Tracking Error in Individuals with Autism: Age-Related Differences
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Background: Individuals with autism spectrum disorder (ASD) often experience challenges with visual-motor integration (VMI), particularly when interacting with dynamic stimuli. However, the underlying causes of these difficulties remain unclear, particularly whether they stem from the dynamic nature of the stimuli or from challenges in coordinating movement.

Objectives: (1) To investigate the effects of diagnosis and age on tracking performance under varying stimulus dynamics and (2) to determine if ASD-related VMI difficulties are more influenced by the speed or predictability of visual stimuli.

Methods: Participants included 62 typically developing (TD) individuals (13.8 ± 5.9 years) and 41 individuals with ASD (13.4 ± 5.9 years). To assess dynamic VMI, an isometric grip-force tracking task was used. To normalize force targets, grip-force maximal voluntary contraction (MVC) was assessed for each participant. Next, participants tracked static targets (15% MVC) and dynamic targets (0-25% MVC). The dynamic targets included *slow* (predictable; $2.5 \pm 0\%$ MVC/sec), *fast* (predictable; $5 \pm 0\%$ MVC/sec), and *wave* (unpredictable; $4 \pm 2.8\%$ MVC/sec) (Fig. 1). Tracking accuracy was measured using relative root mean square error (rRMSE). Participants were categorized as “trackers” or “non-trackers” based on their performance. *Non-trackers* were those whose force exceeded ± 3 times the target for longer than one second in more than three trials per condition. The main analysis included 21 ASD *trackers* (age 15.8 ± 6.6 years, 71% male, IQ 114.3 ± 15.6 , MVC 39.4 ± 16.8 Newtons) and 52 TD *trackers* (age 14.5 ± 6.1 years, 52% male, IQ 118.5 ± 12.7 , MVC 37.7 ± 15.1 Newtons).

Results: Compared to ASD *trackers*, ASD *non-trackers* were younger (11.0 ± 3.7 vs. 15.8 ± 6.6 years, $p = 0.008$), had lower IQs (96.8 ± 17.7 vs. 114.3 ± 15.6 , $p = 0.003$), and more severe ASD symptoms (ADOS-CS: 7.3 ± 1.8 vs. 6.0 ± 1.0 , $p = 0.03$). Significant three-way interactions (Group x Speed x Age) were observed for ASD vs. TD (static vs. fast, $p = 0.005$; static vs. wave, $p = 0.03$; static vs. slow, trend-level at $p = 0.08$), with children showing greater difficulty with dynamic vs. static tracking. No significant diagnosis-by-age effect was found for speeded (relative to slow) stimuli (slow vs. fast, $p = 0.17$; slow vs. wave, $p = 0.64$), however, main effects of diagnosis revealed worse tracking of speeded stimuli in the ASD vs. TD group (slow vs. fast, $p = 0.01$) (Fig. 2). Differences in speeded tracking (*fast* - *slow*) showed a trend-level correlation with ADOS-2 total scores ($r = 0.41$, $p = 0.07$) and a significant correlation with SRS-2 total scores ($r = 0.50$, $p = 0.0009$), such that increased error with increased stimulus speed correlated with more severe ASD features.

Conclusions: Compared to TD controls, tracking accuracy in individuals with ASD declined as stimulus speed increased, correlating with core ASD features. Additionally, younger individuals with ASD showed poorer static versus dynamic accuracy compared to TD peers. These findings highlight the importance of considering stimulus speed when assessing and intervening in VMI challenges in ASD.



405.253 Is It Different with Dads?: Exploring Child Dysregulation Behaviors in Fathers Versus Mothers during Play

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Background: Caregivers play a crucial role in supporting toddlers with autism spectrum disorder (ASD), particularly when it comes to fussiness, or dysregulation. Dysregulation generally refers to emotional regulation patterns that interfere with normal functioning and well-being, and is a common challenge for all toddlers, including those with autism. Given that few studies have compared child dysregulation behaviors between mothers versus fathers during caregiver-child free play interactions, this study aims to examine the differences in intensity of child dysregulation when interacting with one parent compared to the other.

Objectives: This study aims to examine the differences in intensity of child dysregulation when interacting their primary caregiver (moms vs dads). **Methods:** Data were drawn from two larger randomized controlled trials that comprise the current sample of 149 children with autism and their primary caregivers (N= 131 moms, N= 27 dads). At baseline of the intervention, dysregulation behaviors were coded during a 10-minute free-play interaction between the primary caregiver and child. Dysregulation behaviors were categorized by (a) type and (b) proportion of time (in seconds) of dysregulation and (c) intensity of the dysregulation. Dysregulation behaviors include (a) negativity (b) physical venting (c) idiosyncratic behaviors (d) avoidance (e) distraction (f) verbal repetitive behaviors (g) self-soothing and (h) other-directed comfort seeking. Intensity was rated via a five-point scale, with zero indicating no intensity (e.g., child was calm) and five being intense (e.g., child was crying, screaming). Independent sample t-tests were conducted to explore differences in the intensity of the dysregulation behaviors exhibited by the child during interactions with moms versus dads.

Results: Approximately 50% of all dysregulating behaviors were coded as intense. Children exhibited more intense negative behaviors with dads (N=7, M=.71, SD=.48) compared to mothers (N=59, M=.51, SD=.50), and results of the t-test were significant, $t(64)=-1.024$, $p<.001$, Cohen's $d=-.409$. Children also exhibited more intense physical venting behaviors with dads (N=11, M=.64, SD=.48) compared to moms (N=61, M=.51, SD=.50), and result of the t-test was significant $t(70)=-.776$, $p=.035$, Cohen's $d=-.254$. In terms of idiosyncratic behaviors, children showcased more intense idiosyncratic behaviors with dads (N=4, M=.75, SD=.50) compared to moms (N= 55, M=.45, SD=.50), and results of the t-test were significant $t(57)=-1.136$, $p=.002$, Cohen's $d=-.588$.

Conclusions: Results suggest that children are exhibiting more intense behaviors during interactions with dads versus moms. Future research would benefit from including more dads (given the small sample size) and examining other variables during interactions, including caregiver strategies, to further understand how dads are interacting with their children, and how those strategies relate to child outcomes.



405.254 Males and Females Exhibit Different Patterns of Sensory Processing and Regulation

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Background: Autistic individuals often experience atypical sensory patterns, affecting how they perceive and respond to sensory information (Dunn, 2001). Dunn's Model of Sensory Processing (2007) outlines four patterns based on neurological sensory thresholds (high/low) and behavioral reactions (passive/active). Autistic individuals can exhibit either heightened or decreased sensitivity to stimuli and respond passively with minimal reaction or actively by seeking or avoiding sensations (Meuller & Tronick, 2025; Tomchek & Dunn, 2007). For example, common sounds or textures can be overwhelming, leading to avoidance or emotional distress, while others may seek intense sensory experiences like spinning or deep pressure (Behrmann & Minshew, 2015; Reuben & Parish, 2022). Sensory processing variability is a significant aspect of autism, though the underlying factors remain unclear.

There is growing consensus that sex significantly contributes to symptom variability in autism (Braden et al., 2021; Geschwind & Levitt, 2007; Jack et al., 2021). Researchers often underestimate the prevalence of autism in women leading to skewed samples that may obscure sex differences in sensory processing (Loomes et al., 2017). Sex impacts sensory processing in non-autistic samples with females showing greater sensitivity and slower responses to sensory signals compared to males (Mogil & Bailey, 2010; Spierer et al., 2010). Some evidence suggests autistic females may also have heightened sensitivity compared to their male peers, but these studies over-sample males or focus on specific sensory domains (Kiep et al., 2023; Osorio et al., 2021; Walsh et al., 2018).

Objectives: This study examines how sex influences sensitivity of sensory neurological thresholds and behavioral responses in autism.

Methods: This data was collected as part of an NIH-funded longitudinal study, which sampled an unprecedented number of autistic women. Sensory Profile (SP) self-report data were collected from 175 autistic (90 female) and 80 non-autistic (39 female) participants, ages 10 to 34. The SP data were categorized into four sensory patterns: Low registration, sensory seeking, sensory sensitivity, and sensory avoiding. Analyses were conducted to examine the effect of sex assigned at birth and diagnostic category (autistic vs non-autistic) on sensory processing patterns.

Results: In a series of ANOVAs, all demonstrated significant main effects for the diagnostic category, such that autistic individuals were more likely to have atypical sensory patterns (all p s < .001). Moreover, ANOVAs for low registration, sensory sensitivity, and sensory avoiding patterns demonstrated a main effect for sex, such that all females were more likely to exhibit atypical sensory patterns than males. Additionally, there was a significant interaction between diagnosis and sex for sensory sensitivity such that autistic females were significantly more sensitive to sensory stimuli but had less behavioral responsiveness than non autistic females or males (both autistic and non-autistic).

Conclusions: Overall, the present study suggests that both diagnosis and sex may significantly contribute to sensory sensitivity and behavioral responses. Importantly, we found evidence that sex and diagnosis may have a cumulative impact on the type of sensory patterns exhibited. Thus, sex may also contribute to variability in sensory processing and regulation, a diagnostic criterion and an important feature of autism.



405.255 Motor Difficulties in Children with Neurodevelopmental Conditions: A Report from a Cross-National Study in Belgian and Italian Children with Autism, Attention Deficit Hyperactivity Disorder, and Developmental Coordination Disorder

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Background: Beyond the core features of these conditions, altered motor behavior is often reported in neurodevelopmental disorders (NDDs), such as autism, Developmental Coordination Disorder (DCD) and Attention Deficit Hyperactivity Disorder (ADHD). However, the extent to which their motor skills are affected remains unclear. In particular, motor difficulties in autistic children and children with ADHD are rarely recognized, and families may struggle to obtain adequate support. Additionally, motor skill disorders in autistic children may be an expression of comorbid DCD or intellectual disability (ID), which often goes unrecognized.

Objectives: The aim of this study was to explore motor skill difficulties using the Movement Assessment Battery for Children, 2nd edition (MABC-2) comparing typically developing (TD) children with children who have NDDs, and to examine specific profiles among the children with NDDs. **Methods:** We retrospectively evaluated a combined sample ($n=215$) collected in Italy (including children with autism, ADHD, TD) and Belgium (including children with DCD). The sample consisted of 17 autistic children without a comorbidity (autism-only), 40 autistic children with probable DCD (autism+p-DCD), 17 autistic children with ID (autism+ID), 25 children with DCD, 26 children with ADHD and 90 TD children. All participants were assessed with the DCD Questionnaire and the MABC-2; the presence of other pathologies and age at symptoms onset were also controlled. The diagnostic criteria for DCD were assessed in autistic participants following the international recommendations for DCD. Group differences between TD/NDDs and between the NDDs on the MABC-2 scores (total percentile, domain percentile) were assessed with the Mann-Whitney U test (TD/NDDs) or the Kruskal-Wallis test (between NDDs).

Results: The children with various NDDs performed significantly worse than the TD group (Fig. 1A). Within the NDD group, the total score was significantly lower for children with autism+ID compared to those with autism-only ($p<0.001$) and ADHD ($p<0.001$), as well as for children with autism+p-DCD compared to ADHD ($p=0.005$). Among the NDD subgroups, children demonstrated difficulties in different domains (Fig. 1B). Manual dexterity skills were significantly lower in autism+ID compared to any other NDD group ($p<0.02$) and the children with autism+p-DCD also performed worse than the ones with autism-only. Aiming and catching skills were significantly poorer in the DCD group compared to all other NDD groups ($p<0.01$), except for the autism+p-DCD ($p=0.082$), who in turn performed worse than the ADHD group ($p=0.001$). Balance was significantly poorer in both the autism+p-DCD ($p=0.011$) and autism+ID ($p=0.022$) groups compared to the ADHD group.

Conclusions: This cross-national study confirms the extent of motor difficulties in various NDDs and highlights the importance of recognizing the different profiles that may be present based on subgroup characteristics. Children with ADHD show the largest variability in motor skill competence and tend to exhibit the fewest difficulties. In autistic children, comorbid ID or p-DCD may contribute to lower skill levels, but these conditions present distinct challenges, underscoring the need for careful subgrouping of autistic children. Future research is necessary to understand the neural correlates underlying these differences and to determine which types of motor interventions are most effective for these subgroups.



405.256 Motor Profile Differences between Autistic and Non-Autistic Children across Age-Groups

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Background:

Significant motor functioning differences between autistic and non-autistic children, are well documented, with autistics demonstrating greater challenges in executing fine (e.g., cutting, writing) and gross (e.g., walking, jumping) motor tasks compared to their neurotypical peers. However, these differences are usually not compared across a broad developmental age-range. Moreover, no study so far presented a within hierarchical motor profile, from simplest to the most complex motor skills in autism and typical development.

Objectives:

This study investigated group (autistic, non-autistic) and age (early-childhood, preadolescence, adolescence) differences in motor functioning. We predicted better motor functioning in the non-autistic group and among older participants. Moreover, we examined within-group differences in fine and gross motor functioning to identify each study-group's hierarchical motor profile. Predicting this profile was difficult due to the limited prior research.

Methods:

This study included 84 autistic children ages 6-16 years, and 64 non-autistic children matched by age, sex, IQ, and mother education across three age groups (early-childhood, 6-8.5 years, preadolescents, 8.5-12 years, adolescents, 12-16 years). The participants' gross (e.g., catching a ball, hopping) and fine (e.g., Curved-line cutting and nailing) motor skills were assessed using the Individual Motoric Observation Scale (IMOS), yielding scores for each motor behavior, gross and fine motor categories, and overall motor functioning. The IMOS score reflected the percentages of success in each task according to proficiency and quality for various appearance and accuracy components.

Results:

Group (autistic/non-autistic) and age (early-childhood/preadolescence/adolescence) differences in motor abilities were computed by a series of multivariate and univariate analyses of variance (MANOVAs, follow-up ANOVAs). One-way ANOVAs were conducted for the IMOS total score. Overall, non-autistic showed more advanced fine and gross-motor abilities than their autistic counterparts. The adolescents age-group outperformed early-childhood participants on most motor tasks (see Table 1). However, the overall motor performance of non-autistic early-childhood participants was similar to that of autistic adolescents. To explore hierarchical motor profiles differences within each study-groups we compared IMOS components' scores using repeated-measure ANOVA for each group. Post-hoc pairwise comparisons used Bonferroni correction to signify the scale of difficulty from the easiest (a) to the complexed (e) motor task in each group. The non-autistic group exhibited a more homogeneous developmental motor profile, with only two levels of difficulty (a,b). Curved-line cutting and ball catching were more challenging than other motor tasks. In contrast, the autistic group displayed a broader range of motor difficulties, thus hopping was the easiest task (a) and ball catching was the most complexed (e) (see Figure 1).

Conclusions:

Findings align with previous studies depicting motor abilities differences between autistic and non-autistic children. Our investigation of the motor development continuum across three developmental age-groups within the autistic group, despite their motor difficulties, is novel, suggesting their potential motor skills advancement. The variation in the motor profile within each study-group, particularly in the sequence of skill acquisition and the range of task difficulties, enhances our understanding and lead to the development of motor intervention programs focusing on more complex motor tasks that present greater challenges for autistic youth.

**405.257** Multisensory Network Functional Connectivity in Children and Youth with Neurodevelopmental Disorders

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Background: Multisensory integration is an adaptive function that combines information from different sensory modalities into a coherent perceptual Gestalt, enabling individuals to respond to multiple sensory inputs efficiently in daily life. Although atypical multisensory integration has been reported in neurodevelopmental conditions such as Autism and ADHD, little is known about the functional organization of the multisensory network (MSN), nor its relation to other large-scale networks (resting-state networks, RSNs) and whether this functional organization differs across neurodevelopmental conditions. Additionally, how the multisensory networks relate to other sensory issues across diagnoses has not been explored.

Objectives: This study investigated how multisensory regions are functionally organized within the MSN and between the MSN and RSNs in children and youth with ASD, ADHD, and typically development (TD), and its associations with individual's sensory characteristics.

Methods: Resting-state fMRI data from 417 participants collected by the Province of Ontario Neurodevelopmental Network were analyzed (ASD=174, ADHD=130, TD=113; Mean age=11.96±4.10; 32% female). Timeseries were extracted from five regions in the MSN and 51 regions in seven RSNs (See Figure 1A). Non-directional (Pearson correlation) and directional (Granger causality) functional connectivity (FC) metrics were computed within the MSN and between the MSN and RSNs. Sensory Characteristics were measured via the Short Sensory Profile. Diagnostic differences and associations with sensory characteristics were assessed, while controlling for age and sex. Finally, data-driven clusters (k-means and k-medoids depending on data normality) based on the connectivity features were examined in associations with diagnoses and sensory characteristics to characterize group membership.

Results: Both non-directional and directional FC analyses confirmed the thalamus as a hub region within the MSN and between the MSN and RSNs, with no significant differences by diagnosis, although Autism and ADHD groups showed increased functional connectivity overall (Figure 1B 2A). In contrast, sensory characteristics were significantly associated with both non-directional and directional FC within the MSN and between the MSN and RSNs regardless of diagnosis. Our analyses using FC patterns to create data-driven clusters revealed three groups with varying levels of neural connectivity from non-directional FC and two groups from directional FC. Within these data-driven clusters, each diagnosis was proportionately represented. On the other hand, these data-driven clusters mapped on to the overall level of sensory issues reported, such as generalized sensory difficulties and sensory adaptations (Figure 1C, 1D, 2B, 2C). That the data-driven clusters based on FC sorted groups by sensory characteristics well, but failed to sort by diagnosis, suggests that these sensory characteristics and their underlying neurobiology are transdiagnostic in nature.

Conclusions: Although both Autism and ADHD groups exhibited greater sensory difficulties compared to TD group, the functional organization of the MSN was more closely aligned with sensory characteristics than with the diagnostic labels, suggesting that sensory characteristics, and sensory issues more broadly, are transdiagnostic as opposed to specific to Autism. This reflects the heterogeneity and overlaps in multisensory integration at both behavioural and neural levels in Autism and ADHD. This underscores the link between the functional organization of the MSN and real-life sensory difficulties, irrespective of diagnostic categories.



405.258 The Relationship between Sensory Alterations and Restrictive Repetitive Behaviors in Children with Autism Explored with Fourth-Generation Artificial Neural Networks.

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Background:

Restrictive Repetitive Behaviors (RRBs) and sensory features are core symptoms of autism spectrum disorder (ASD); their impact on patients' quality of life warrants extensive literature studying them. Few studies so far have addressed the nature of the interplay between these two traits with a data mining approach.

Objectives:

The aim of the present study was to depict the associations between demographic and clinical variables and the full spectrum of RRBs and sensory processing abnormalities in a sample of children with a diagnosis of idiopathic ASD using data mining techniques belonging to artificial intelligence. The expectation is that this approach would be able to uncover important latent connections between RRBs and sensory abnormalities and other clinical/demographic variables considered.

Methods:

Forty-five patients under 18 years (range: 3–15, median 6) with ASD diagnosis according to DSM-5 entered the study. Demographic information (gender, age), clinical variables (epilepsy, sleep problems, Intellectual Disability (ID), rehabilitation therapy, pharmacological therapy), and Short Sensory Profile (SSP) subscales scores and Repetitive Behavior Scale-Revised (RBS-R) subscales scores have been collected in anonymized form and recorded in an Excel database. To graphically show the most important connections among the 25 variables we used a fourth-generation artificial neural network (ANN) called Auto-CM, that develops weights that are proportional to the strength of the associations of all variables each other. After the training phase, the weights matrix of the Auto-CM represents the warped landscape of the dataset. Subsequently, a minimum spanning tree filter is applied to the weights matrix of the Auto-CM system to obtain a map of the main connections between the variables of the dataset and the basic semantic of their similarities, defined connectivity map.

Results:

Figure 1 show the semantic connectivity map produced by the Auto-CM software. The map (figure 1) highlighted these interesting features: 1) the Low Energy subscale (SSP-VI) has proven to be the central hub of the system; 2) the Self-Injurious Behaviors subscale was directly linked to ID; 3) RRBs was directly linked with sleep disturbance, with Sameness Behaviors (RBS-V) and Ritualistic Behaviors (RBS-IV); 4) sequential links line connecting RBS-R subscales Sameness Behaviors, Restricted Interests, Ritualistic Behaviors, Stereotyped Behaviors, Compulsive Behaviors and the variable male.

Conclusions:

The application of ANNs to our dataset confirmed the well-known association between RRBs and sensory abnormalities; moreover, interesting association between demographic/clinical variables and SSP and RBS-R subscales, previously emerged by classical statistical analysis, were confirmed and deepened. Interesting links emerged between the subscale Self-Injurious Behaviors and Intellectual Disability and between Sleep Disturbance and various RRBs. In conclusion, our study provides new insight into the relationship between RRBs and sensory abnormalities in children with ASD by applying ANNs for the first time in this area.



405.259 Psychometrically-Based Evaluation of a Causal Theory Linking Imitation and Autism Using SPARK

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Background: Imitation skills help children build social-communicative reciprocity and learn social skills. Accordingly, imitation has been identified as a core area of weakness in autism and a potential intervention target. Although the impact of imitation on autism symptomatology has not been fully clarified or supported, other theories focused on “interpersonal synchrony” have gained attention. Specifically, Mostofsky & Ewen (2011) proposed that children learn by watching and performing actions while interpreting sensory feedback to optimize future actions. Disruptions to this process may contribute to autism symptomatology, with its core social and prevalent motor skill deficits. The challenge to evaluating this theory is that it is impossible and unethical to manipulate imitation ability and record social and motor outcomes. We have iteratively improved a statistical approach, involving psychometric and causal-inference aspects, to use observational data to evaluate this theory.

Objectives: We tested a model proposed by Mostofsky & Ewen (2011), which posits that imitation is essential for motor and social skill development in autism. The implication of this model is that imitation can contribute to motor and social skills differences and is thus falsifiable if the relationship between motor and social skills does not depend on imitation.

Methods: Using the SPARK cohort, relevant constructs were created from a mix of the Developmental Coordination Disorder Questionnaire (DCDQ), Social Communication Questionnaire (SCQ), and other background information. 19,188 autistic children aged 5-18 had a complete set of all relevant items. The core premise of the analysis is that motor skills and social skills should be (1) correlated and (2) that this correlation is caused by imitating throughout development. Therefore, covarying for imitation ability should reduce the correlation between social and motor skills. Extensive psychometric work and multiple raters established a subset of DCDQ and SCQ items as valid constructs for social and motor skills, respectively. A two-factor model of social skills and one-factor model of motor skills achieved adequate fit (CFI/TLI > .90, RMSEA < .08), without the need for hierarchical or non-hierarchical bifactor models.

Results: The correlation between social and motor skills was moderate and significant ($r = .34$, $p < .001$, 95% CI [.33 .35]), and the partial correlation between social and motor skills, covarying for imitation was also moderate and significant ($r = .27$, $p < .001$, 95% CI [.26 .28]).

Conclusions: Though covarying for imitation reduced the correlation between social and motor skills, it was a minor absolute change. We argue that a theory in which including a key causative variable only reduces the existing correlation by $r = .07$ is unlikely to be true. The approach utilized here, using a cross-sectional convenience sample, is far from the detail of representational processes that the original authors posited. Understanding the relationship among imitation, motor skills, and social functioning can help develop better models of how these skills develop, and more effectively target interventions to address social and motor functioning.

405.260 Common Neural Activity Patterns for Sensory Processing and Intolerance of Uncertainty in Autistic Children

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Background:

Sensory differences are common in autism and can influence a host of behavioral domains. Unfortunately, the behavioral and neural correlates of sensory difficulties remain somewhat elusive, which limits the effectiveness of clinical supports. The brain's ability to predict upcoming sensory events, based on past experience, is central to sensory function, and has been implicated in autism (i.e., predictive coding). In turn, long-term irregularities in prediction of sensory inputs could lead to development of an intolerance of uncertainty (IU). Atypical functioning of both sensory cortices and neural processing outside of these areas (i.e., supramodal) could contribute to such sensory differences. Specifically, predictive function is thought to be subserved by a network of supramodal regions—e.g., cerebellum, pre-motor cortex, temporal-parietal junction, etc. Thus, we propose that irregular function and connectivity in such regions likely contribute to atypical sensory processing and IU in autistic persons. Examining prediction and its neural correlates could provide a useful perspective regarding sensory processing in autism.

Objectives:

We aimed to examine the relationship between behavioral sensory processing, IU, and autistic traits, and the association between these measures and functional connectivity between sensory and supramodal brain regions. We hypothesized that the autistic participants would demonstrate significant relationships between sensory processing, IU, and autistic traits, and that these measures would correlate with connectivity between sensory cortices and nodes in a previously established prediction-related brain network (e.g., Siman-Tov et al., 2019).

Methods:

Participants were 30 autistic children (27 male; mean age=9.13 years) and 26 nonautistic peers (19 male; mean age=9.38). All participants underwent a resting-state functional magnetic resonance imaging scan (rs-fMRI). Parents also completed several questionnaires: Short Sensory Profile (SSP), Intolerance of Uncertainty Scale (IUS-12), and the Social Responsiveness Scale-2nd Edition (SRS-2). One-way analysis of variance (ANOVA) was used to test between-groups differences for each behavioral questionnaire. Furthermore, relationships between the behavioral questionnaires were calculated using partial correlations, controlling for age and autistic traits (when appropriate). Finally, between-groups differences in functional connectivity and associations between functional connectivity and behavioral results were evaluated via multi-voxel pattern analysis (MVPA) in both a combined autistic-neurotypical sample, as well as within each group separately.

Results:

Results revealed that autistic children presented with significantly more sensory atypicalities, greater IU, and heightened autistic traits, compared to nonautistic children. Additionally, correlational analysis revealed behavioral interrelationships between these constructs. We observed significant associations between both behavioral sensory processing and IU and functional connectivity between occipital cortices and the right premotor cortex in the combined sample and within-groups. Distinct, but partially overlapping, functional connectivity results were found to be correlated with autistic traits in both groups.

Conclusions:

Our findings suggest that sensory processing and IU share common brain mechanisms, previously shown to be involved in sensory (esp. visual) function, action planning, and prediction. As such, these results may indicate that sensory processing and prediction are linked, both behaviorally and physiologically, with each other, as well as with autistic traits, regardless of diagnosis. These results may provide clinicians and stakeholders with targets for new and improved supports for autistic people.

Poster Session**406 - Service Delivery/Systems of Care I**

May 1st, 2025, 12:30 PM - 1:30 PM - Hall 4A

406.261 School-Based Services for Adolescents with Autism: Relations with Mental Health Functioning and Post-Pandemic Needs
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Background: Mental health conditions are prevalent among autistic adolescents. Fifty-seventy percent have anxiety (Kerns et al., 2020) and they are twice as likely as non-autistic peers to experience depression (Hudson et al., 2019). Needs were exacerbated during COVID-19 and continue to burden families and schools (Kobb et al., 2021; Kotowski et al., 2022). Schools are well-positioned to provide mental health services for adolescents, as they circumvent key such as including transportation challenges, inadequate insurance coverage (Bear et al., 2014). However, little is known about specific school-based services used by autistic adolescents.

Objectives: Aims were to compare service use and quality for adolescents with autism to other conditions, identify needs arising from the pandemic, and investigate how service use relates to mental health functioning.

Methods: Data were from a survey of caregivers of youth with disabilities ($N=72$, ages 12-18 years, $M=14.33$ years, $SD=1.82$). Caregivers were allowed to select multiple disability categories for children, thus co-occurring disabilities are reflected in total counts. Disabilities included autism ($n=23$), ADHD ($n=17$), anxiety ($n=23$), depression ($n=17$), developmental disability ($n=22$), cognitive impairment ($n=13$), learning disability ($n=37$). Youth were predominantly male (61%) and White (57%). Caregivers completed the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997) to assess youth mental health, and researcher-developed Services and Needs questionnaire rating school services, and quality of services, adolescents received, aligned with state and federal (IDEA 2021) regulations. Caregivers identified needs arising during the pandemic. Preliminary analyses examined descriptive trends. Multiple regression will test associations between services, service quality, disability with mental health functioning.

Results: Across the entire sample, top 10 services accessed by adolescents with disabilities were instructional (56%), social skills (54%), counseling (53%), medical (53%), parenting counseling (43%), school health (43%), guardianship (39%), assistive technology (38%), speech-language therapy (36%), and early assessment (35%). See Table 1 for most frequent use across disability. Service use in autism ($M = 8.79$, $SD = 2.99$) was higher than ADHD ($M = 5.86$, $SD = 2.71$; $t = 3.91$, $p < .001$) and cognitive impairment ($M = 6.41$, $SD = 2.06$; $t = 3.53$, $p < .001$) but lower than learning disability ($M = 13.45$ services, $SD = 4.01$; $t = 5.01$, $p < .001$). Service use did not differ significantly between autism and anxiety ($M = 8.00$, $SD = 2.71$; $t = 1.06$, ns) and depression ($M = 7.69$, $SD = 2.71$; $t = 1.61$, ns) categories. On average, caregivers rated quality of most frequently used school-based services 3.18 on a 5-point scale, with highest quality ratings for medical (3.45), counseling (3.34), early assessment (3.32). Lowest quality were instructional support (3.10), parent counseling (3.03), social skills (2.95). Figure 1 displays post-pandemic needs across disability categories.

Conclusions: Autism school-based service use outpaced other categories (e.g., ADHD) and was similar to anxiety and depression. Services used at high rates for adolescents with autism and other disabilities (e.g., social skills) were rated as relatively lower in quality compared to other, less frequently used services. In the post-pandemic era, school-based service needs for autism are among the highest across disability categories.



406.262 : Does Training Improve Therapist Confidence and Practice in Adapting Cognitive Behaviour Therapy (CBT) to Meet the Needs of Autistic Adults?

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Background:

Autistic adults report that psychological therapists being unable to tailor their approach can be a barrier to accessing appropriate mental health support (Adams and Young, 2021). Cognitive Behavioural Therapy (CBT) has been shown to be effective in treating mild to moderate anxiety and depression co-occurring with autism when adapted to meet autistic people's needs (Weston et al., 2016). However, therapists do not routinely receive training in these adaptations and report a lack of knowledge, skills, and confidence to adapt their practice.

Objectives:

We evaluated the impact of a brief, self-directed training in adapting CBT practice for autistic people using mixed methods to investigate (i) changes in CBT therapist confidence following training and (ii) implementation of adaptations in the medium term (5 months).

Methods:

This study was hosted as a study within a trial (SWAT 213) with the clinical trial investigating the effectiveness of a low-intensity CBT intervention for depression (ADEPT-2). Training materials about adapting CBT practice for autistic people were provided to CBT therapists in the Treatment as Usual (TAU) arm and comprised 2 hours of informational content with video role plays to illustrate practice points. Participating therapists completed an online survey, pre (n=109), post (n=66), and 5 months (n=26) after accessing the training materials. The survey asked about therapists' experiences working with autistic people, familiarity with the practice points and included the Therapist Confidence Scale (TCS). At 5 months follow-up, the survey also asked about use of adaptations in practice. Therapists were also invited to join a focus group to further understand their experiences of accessing the training materials.

Results:

The majority of therapists (n=63, 95.45%) endorsed the training as useful for their CBT practice, and 37 (56.06%) reported the training improved their knowledge. A significant improvement in TCS scores was found at follow-up, ($t = -4.023$, $p < .001$) (pre-training mean TCS=42.77 (SD=12.16); follow-up mean TCS 50.88 (SD=10.56)) with an average increase of 24.96%. Of the 26 therapists completing the 5-month follow-up, 15 (57.69%) reported their practice had changed following the training. Five therapists participated in a focus group, and their experiences in applying the training will be explored using thematic analysis.

Conclusions:

The findings of this study provide preliminary evidence that brief, self-directed training can enhance therapists' confidence to adapt their practice to meet the needs of autistic people. The sample size is limited and may be biased to those interested in the training. Findings indicate that therapists can put the training into practice. More systematic evaluation of therapist training is required to increase the accessibility of standard psychological interventions provided in routine care for autistic people.

Russell, A., Langdon, P. and Woodworth V. SWAT 213: Effects of providing information about enhancement treatment as usual on recruitment and retention to trials with autistic adults with depression .

<https://www.qub.ac.uk/sites/TheNorthernIrelandNetworkforTrialsMethodologyResearch/FileStore/Fileupload,2046292,en.pdf>

406.263 The Role of Family Quality of Life in the Caregivers of Autistic Adolescents Receiving Treatment for Daily Living Skills

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Background: Adolescence may be a particularly challenging time for autistic teens and their caregivers as they simultaneously navigate developmental expectations including identity development, evolving family dynamics, and increased independence and autonomy, while also considering how their diagnosis of autism may impact their identity and relationships with others. Adolescence is a critical time to examine family quality of life (FQOL) as both autistic teens and their caregivers are navigating the challenges that naturally arise with the transition from high school to adulthood, yet few studies have examined FQOL in the caregivers of autistic adolescents. Further, no studies have examined how a daily living skills (DLS) intervention (i.e., Surviving and Thriving in the Real World - STRW) may impact FQOL by providing support to caregivers and teens.

Objectives: Specific research questions were: (1) What is the profile on the Beach Center FQOL scale for autistic teens?; (2) What demographic, teen, and parenting characteristics are associated with FQOL?; (3) Does the STRW intervention lead to improved FQOL?; and (4) Is FQOL related to change in DLS after receiving the STRW intervention?

Methods: Sixty autistic adolescents and their caregivers completed the 14-week STRW intervention focused on DLS (e.g., hygiene, cooking, cleaning, laundry, managing money). At baseline and post-treatment caregivers reported on their FQOL using the *Beach Center Family Quality of Life* (FQOL Scale) which consists of the Family Interaction, Parenting, Emotional Well-Being, Physical Well-Being, and Disability Support subscales. Measures assessing autism symptomatology, adaptive behavior, internalizing and externalizing symptoms, and parenting constructs were also collected.

Results: Results revealed the following pattern on the FQOL Scale at baseline: Physical Well-Being > Family Interaction > Parenting > Disability Support > Emotional Well-Being. Pair-sampled t-tests revealed that the Physical Well-Being score was significantly greater than the Family Interaction, Parenting, Emotional Well-Being, and Disability Support scores (all p 's < .001); and that the Emotional Well-Being score was significantly lower than the Family Interaction, Parenting, and Disability Support scores (all p 's < .001). The FQOL Scale was significantly correlated with caregiver reported repetitive behaviors and parenting characteristics (i.e., Discipline, Attachment, Involvement, Parenting Confidence, School Satisfaction). The Family Interaction, Parenting, and Overall FQOL scores were significantly improved (all p 's < .03) after completing the STRW intervention. Bivariate correlations revealed a significant relationship between the Emotional Well-Being score at baseline and the change in caregiver reported DLS from baseline to post-treatment ($r = .29$, $p = .03$).

Conclusions: The results highlight the importance of also considering the characteristics of the caregiver and the family system. Many interventions delivered to autistic adolescents rely on the caregiver to provide instruction and coaching, which makes it essential to understand how factors including emotional well-being and access to needed services at school may affect the ability to commit to and implement the treatment plan. The results suggests that families who have ways to relieve stress, have a support system, and have time to pursue their own interests may be better able to support adolescents as they work to build independence and autonomy. Limitations are also discussed.



406.264 A PATH to Neuroinclusive Care

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Background: The PATH Program (Promoting Accessibility To Healthcare) at UC Davis Health, a system-wide initiative, aims to improve healthcare experiences for individuals with neurodevelopmental conditions (NDC) and their families. Studies show that individuals with NDC face higher healthcare utilization, costs, and unmet needs, along with unique stressors that often lead to care refusals and challenging behaviors. Most healthcare providers receive minimal training on supporting neurodivergent individuals, which contributes to medical trauma and care avoidance. These issues can be addressed through training in patient-centered and neuroaffirming care.

Objectives: Develop a scalable training program for healthcare providers, designed to address common barriers faced by individuals with NDC and foster their participation in their healthcare.

Methods: Using an implementation science framework, a comprehensive hospital training program was created. A needs assessment highlighted key areas for the training, such as environmental and sensory adaptations, visual support strategies and individualized care plans. Feedback from an advisory community group, comprised of providers, patients and caregivers, helped ensure the training reflected real-world needs and experiences. Discussions with hospital stakeholders further emphasized the healthcare disparities faced by neurodivergent individuals and aligned the program with broader institutional diversity, equity, and inclusion goals. Medical providers also contributed insights, ensuring that content delivery was tailored to their needs, while PATH team meetings facilitated the creation of unit-specific materials. The program emphasized the practical application of PATH strategies to foster a more inclusive healthcare environment.

To date, the training has been implemented across settings within the UC Davis Health system: laboratories, vaccination clinics, pediatric primary care, Children's Surgery Center, EEG and Sleep Medicine Clinics, and integrated into the Nursing, Physician Assistant, and Medical School curricula.

Results: Pre-training surveys indicated that 96% of providers had cared for neurodivergent individuals, but 80% had never received formal training. While many entered with some prior knowledge of neurodivergent care strategies, the training led to significant improvements in confidence.

Providers rated their confidence on a scale of 1 (very low) to 5 (very high) before and after the training. Confidence in working with neurodivergent patients increased significantly from pre ($M = 3.23$, $SD = 0.58$) to post ($M = 3.78$, $SD = 0.57$), $t(50) = -4.46$, $p < 0.0001$. Confidence in making environmental adaptations during medical visits also rose from 3.19 ($SD = 0.72$) to 3.82 ($SD = 0.58$), $t(50) = -5.79$, $p < 0.0001$, and confidence in implementing sensory and visual strategies improved significantly, from 3.19 ($SD = 0.88$) to 3.88 ($SD = 0.54$), $t(50) = -6.23$, $p < 0.0001$. The training satisfaction survey revealed providers strongly agreed that the content was relevant to their work and would aid in supporting patients and families.

Conclusions: Healthcare providers often have some baseline knowledge about neurodivergent care, but formal training in evidence-based practices is scarce. This lack of training exacerbates medical trauma and care avoidance. By adopting patient-centered, neuroaffirming care models, healthcare systems can implement strategies that promote more inclusive care environments for neurodivergent individuals. The PATH program serves as an essential step toward achieving these goals.

406.266 A Qualitative Analysis of Applied Behavior Analysis Practitioner's Views and Approaches to Assent-Based Behavior Analytic Therapy for Autistic Children

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Background:

Therapies based on applied behavior analysis (ABA) are effective for improving outcomes for individuals with autism spectrum disorder (ASD; National Autism Center, 2015). However, autistic self-advocates argue that ABA-based therapy does not include the patient themselves in the treatment planning process, violating the autonomy and self-determination of the patient (e.g., Wilkenfeld & McCarthy, 2020). The Behavior Analyst Certification Board (BACB) recently elaborated the consent requirements for therapeutic services within their Ethics Code for Behavior Analysts to include assent procedures (BACB, 2020). Despite the acknowledgement that patient assent should be a critical feature of ABA-based therapy, there is minimal research demonstrating assent-based therapy methods that are both effective and practical. Without evidence-based procedures to assess and obtain assent from patients, and procedures for guiding therapeutic decisions when clients withdraw assent, practitioners are at risk of violating patient autonomy.

Objectives:

The purpose of the current research is to conduct practice-based research using a qualitative analysis of how applied behavior analytic practitioners working with autistic children implement assent-based procedures. This study is exploratory and descriptive in nature (i.e., is pilot work to support future research).

Methods:

We are conducting this study using qualitative methods of inquiry; specifically, we are using interpretive description (Thorne, 2016). This study is also being conducted within a community-engaged and practice-based framework. The community partners for this work are active practitioners who provide ABA-based services to children with ASD, and all data are being collected on the site of their practice. We are analyzing 3 sources of data: video observations of ABA therapy sessions (includes a behavior technician and a client), semi-structured interviews with practitioners (includes behavior technicians, behavior analysts, and leadership for the organization), and a document review of the organization's clinical manual. Our current sample size is 9 children (clients) and 10 practitioners (demographic data are shown in Table 1). Our target sample size is driven by information power (e.g., saturation) and was not determined *a priori*. Data collection and analysis are ongoing and we anticipate completing analysis by April 2025.

Results:

Preliminary data analysis has resulted in the construction of an over-arching framework for assent procedures in the context of practice (Figure 1). The left portion of Figure 1 displays the conceptual framework, and the right portion displays the practical framework for embedding assent procedures into ABA-based services. The arrows within the figure indicate connections and bi-directional flows between concepts. These data are preliminary and exploratory, and data collection and analysis are still ongoing.

Conclusions:

One preliminary conclusion based on our analysis is that incorporating assent into ABA-based services for autistic children is complex and involves an interaction of concepts and actions that goes far beyond the definition of assent. Our analysis indicates that there is a key relationship between the culture of the organization that provides services and the assent procedures themselves, and summarizes the interaction across 8 key conceptual areas (the hard-rectangles in the 3rd row of Figure 1). These conclusions are preliminary will be refined through further data collection and analysis.



406.267 A Systematic Review of Perspectives and Service-Use Experiences during the Transition to Adulthood Among the Latine Autistic Population and Their Families

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Background: Prevalence rates in the diagnosis of autism have shifted with Black, Latine, and Asian children now exceeding the autism prevalence rate of white children. Early intervention programming has received a great deal of attention. Yet, transition-age youth and ethnic/racial ethnic youth who experience a “service cliff” upon leaving high school, have been underexplored. A case example is the Latine population. Improved methods of diagnosis and heightened autism awareness have contributed to increases in the identification of autism among Latine children and youth in recent years. This improvement in early detection of autism and associated efforts in early intervention for Latine children have been promising for young children. The greater number of early diagnoses implies a surge in youth and adult Latine autistic individuals in need of care. However, there is a stark difference in the understanding and support provided to the growing youth and adult Latine autistic populations.

Objectives: The objective of this study was to develop a systematic review of research about perceptions of the transition to adulthood and service use among the autistic Latine population and their families.

Methods: A systematic review was conducted to ascertain the barriers and enablers of healthcare access to services for autistic Latine transitioning to adulthood. Because our review specifically focused on this population, we only included intervention- and service use-based studies with participants ages 18 to 25, Latine, autistic and parents of these transition-age Latine autistics. We systematically searched Google Scholar and PubMed, limiting the publication timeframe between 2013 to 2023. We used the following key terms to find articles: *autism, transition to adulthood, Latino, services, and healthcare*. Exclusion criteria include pediatric studies (< 18 years), non-ASD primary diagnosis, studies of parents of children under the age of 18, review papers (systematic or narrative), book chapters, case studies, commentary articles, opinions, letters, and editorials.

Results: Initially, 21,300 results were included with string search. Limiting the search to 2013-2023 resulted in a cutoff of 3,200 articles. Ten articles remained, of which three were eligible for inclusion in our review. The exclusion of articles was conducted in stages: title and abstract, objectives/research aims, and method scan. After the initial scan, two articles were excluded based on title and abstract content. A more comprehensive scan of articles by authors excluded an additional five articles because these were: a letter on postsecondary support for autistic students ($n=1$), limited inclusion of minorities ($n=4$); primarily of white or non-Latine background) and/or included autistic children (< 18 years of age).

Conclusions: The present study demonstrates a considerable lack of research on Latine transition-age youth and their families. A key finding was the inconsistency in racial and ethnic terms used to identify the population in the articles, such as ‘Hispanic’, ‘Latino’, ‘Latinx’, and ‘Latine’. Given that only three articles were ultimately included in our review it is evident autism research must expand inclusion criteria and outreach to this population. Article themes regarding the transition to adulthood, service use experiences, and directions for future research will be discussed.

406.268 Access Optimization for Autism Specialty Care CentersC. M. Taylor¹, K. Oetjens¹, S. Gai² and J. Wilck², (1)Geisinger, Lewisburg, PA, (2)Bucknell University, Lewisburg, PA

Background: Nationwide, access to care for individuals with specialty care needs is inadequate. According to the Centers for Disease Control and Prevention (CDC), 17.3% of children between 3 and 17 have at least one developmental disability. Timely identification and accurate diagnosis are imperative for accessing appropriate educational and therapeutic interventions. Moreover, diagnosis enables etiologic investigations, including genetic studies, which can impact medical management for children and reproductive planning for their families. Typically, primary care providers identify children at risk for developmental disabilities by eliciting parental concern or conducting routine developmental screening. Currently, the American Academy of Pediatrics (AAP) recommends the use of standardized, formal general developmental screening tools at 9, 18, and 30 months of age in addition to specific screening for autism spectrum disorder (ASD) at 18 and 24 months. Children presenting with developmental delays should then be referred to specialists such as neurodevelopmental pediatricians (NDPs), developmental-behavioral pediatricians (DBPs), or clinical psychologists for further evaluation. In 2016, fewer than 800 DBPs were in the USA, and about 25% of them were nearing retirement age. This has created excessive and arduous wait times for patients to be correctly diagnosed, with wait times in some areas exceeding 18 months for the initial appointment.

Objectives: Our work seeks to expand the ability of specialty care autism clinics to manage patient access. Our project seeks to understand (1) access problems for individuals with autism (2) rural healthcare access specifically and (3) how processes changes have impacted patient care.

Methods: Patient data was extracted from the Electronic Health Record (EHR) to determine waiting times, location, and other patient factors (e.g., age, insurance coverage). The research team extracted, cleaned, and visualized the data from October 2021 to February 2024. The CRoss Industry Standard Process for Data Mining (CRISP-DM) model was followed. Metrics included include the following: (1) Average wait time for a developmental evaluation (with a breakdown based on age and geographic region) and (2) Total number of patients on the waitlist for initial appointments.

Results: In our rural population, we identified the average wait time from referral to evaluation is 224 days with most patients waiting 211 days from the time of referral to evaluation. Of note, implementation of a new model involving intake evaluations decreased the wait time for patients to 133 days. The majority of patients referred to our clinical center are two years old; however wait times are similar across age groups. Implementation of telemedicine models also decreased wait times for most patients.

Conclusions: Using our data mining system, our clinic can identify the effectiveness of our referral and evaluation process. Furthermore, the data visualization tool tracks important metrics, and this visualization could be reproducible at similar centers. In future work, we will further expand our tool to help us better track return evaluations for individuals impacted by autism and developmental disabilities.

406.269 Adapting a Leadership Implementation Strategy for Implementation Teams in Autism ServicesA. R. Johnson^{1,2}, C. K. Josol¹, L. Brookman-Frazee² and A. C. Stahmer¹, (1)Child and Adolescent Services Research Center (CASRC), San Diego, CA, (2)Psychiatry, University of California, San Diego, La Jolla, CA, (3)UC Davis MIND Institute, Sacramento, CA, (4)UC Davis MIND Institute, University of California at Davis MIND Institute, Sacramento, CA

Background: Evidence-Based Autism Interventions (EBIs) are often not used in routine services. The TEAMS Leadership Institute (TLI) is an implementation strategy designed to improve implementation leadership and climate in public service systems (education, mental health) to support EBI use. A state-wide implementation trial of TLI found significantly greater provider EBI fidelity and child outcomes in TLI-trained programs compared to those that did not receive TLI. However, for autism services, TLI required the involvement of multiple team members rather than individual leaders.

We collaboratively developed TLI2 which incorporates a Team Charter Approach derived from team effectiveness research (TER) designed to increase team functioning related to shared cognition (i.e., common understanding of tasks and objectives) and team cohesion (i.e., commitments to each other and the group purpose).

Objectives: This presentation will (1) describe the collaborative approach to adapt TLI1 to include team-based enhancements to TLI2, and (2) characterize team-based mechanisms hypothesized to improve implementation in a scale-out trial of TLI2.

Methods: We used an iterative approach to collaborate with community stakeholders and team effectiveness research experts to co-design a generalizable team charter approach to integrate with TLI. Community partners familiar with TLI participated in focus groups to provide suggestions on the integration of team charters and provided feedback on a subsequent version of TLI2. Using a scale-out trial design (Aarons et al., 2017) 37 implementation support team members from seven programs and school districts participated in the TLI2 trial. They completed a card sort task at baseline to identify alignment in perceptions and roles of key autism EBI implementation support tasks.

Results: Aim 1. Community partners and team-effectiveness research experts emphasized the importance of team composition and systematically identifying implementation support team members. They also recommended fostering open communication within hierarchical systems and collaboratively defining each team member's responsibilities for EBI-specific tasks, ensuring time for task completion and clear role specification. Key adaptations included (1) development of a team charter or implementation plan outlining team goals, roles, and processes; (2) inclusion of team members across the organization, not just leaders; (3) identification of team resources and consultants (e.g., IT); (4) a focus on implementation climate with reduced focus on implementation leadership; (5) use of a card sort assessment to identify implementation tasks and roles.

Aim 2. Baseline data from the TLI2 trial indicated poor initial agreement between team members on potential EBI-specific tasks and roles, indicating an absence of a shared mental model of implementation support tasks. All seven programs developed a team-based implementation plan with role specification across members. We anticipate the integration of the team charter and card sort activities enhances shared understanding of tasks and supports task completion. Implementation process data over six months, including changes in role specification agreement, team processes, and adherence to the implementation support plan, will be presented.

Conclusions: This study highlights a community-partnered approach to developing and adapting organizational-level implementation strategies and the value of integrating team-effectiveness mechanisms. Developing and testing implementation strategies is essential to ensure EBIs reach the intended recipients.

406.270 Addressing Health Inequities for People with Autism and Related Disabilities in the Hospital through Stakeholder Partnerships

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Background: People with autism and intellectual/developmental disabilities (IDD) deserve the same access to quality healthcare, yet are at increased risk of medical and/or psychiatric conditions as compared to the general population. Autistic patients and patients with IDD report healthcare inequities including less health satisfaction, shorter life expectancy, less access to preventative care, higher chronic health conditions, overutilization of psychotropic medications, and increased mortality (Lin et al., 2021; Lindgren et al., 2021). Although patients with IDD are 9 times more likely to be hospitalized than peers, this population and their caregivers report high levels of dissatisfaction with emergency/inpatient care. Barriers include lack of training, limited resources, competing priorities, ableism, and systemic bias (Ailey, Brown, & Ridge, 2017).

Objectives: This project builds capacity of inpatient nursing staff to understand the medical, social, environmental, and mental/behavioral health needs of patients with autism and IDD, to promote optimal healthcare outcomes. 1) Describe the tiered model of didactic and simulation training; 2) Present data from a pre-intervention survey and associated intervention outcomes.

Methods: We developed the Advancing Supportive Care through Education for Nurses on Disabilities (ASCEND) Program, to build the capacity of inpatient/Emergency Department (ED) nurses to understand the medical, social, environmental, and mental/behavioral health needs of autistic and disabled people. ASCEND is multidisciplinary and includes people with autism/related disabilities and family advocates *as full partners in the initiative*.

Tier 1: Five didactic modules were integrated into the online learning platform for a major regional hospital: Attitudes and Barriers to Care, Adapted Nursing Care, Medical Comorbidities, Mental Health, Managing Crisis. **Tier 2:** Simulations include autism/IDD specific scenarios relevant to their associated presentations, barriers, and biases.

Participants included nurses in pediatric and adult inpatient and ED units who participated in Didactics (n=1079) and Simulations (n=52). They completed standardized measures at baseline (T1) and immediately after training (T2) capturing the following dimensions: disability knowledge, disability healthcare attitudes, clinical comfort, organizational climate, and training satisfaction. Analyses included descriptives on nurse demographics and unpaired samples t-tests to compare domain scores pre/post training. Exploratory analyses were conducted to compare scores on T1 measures by group (e.g., gender, practice context).

Results: Baseline (pre-training) data for Tier 1 (didactics) indicate comparable barriers to care across settings (e.g., medical versus psychiatry, adult versus pediatrics), with a few exceptions (n=244). Nurses working in the medical setting report a better organizational climate than those working in psychiatric settings (p=.04), and female-identifying nurses reported more positive attitudes toward disabled people than male-identifying nurses (p=.008). Baseline scores indicate lowest domain scores for clinical knowledge (M=19.0) as compared to organizational climate (M=31.2), clinical comfort (M=33.2), and attitudes (M=30.3). At T2, participants reported improvements on clinical comfort (p<.01), knowledge (p<.01), and climate (p<.01) domains, but decreases on attitudes (p=.05).

Conclusions: The success of initial development and pilot deployment suggest the feasibility of the model. Pre/post data will indicate preliminary efficacy of the tiered system of training. Scale-up and sustainability is planned, as the ASCEND model will be deployed to at least 10 partner hospitals over the next 3 years.

406.271 An Exploration of Early Intervention and Screening Delays for Asian American Families with Limited English Proficiency

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Background:

Immigrant families encounter barriers to healthcare access, resulting in poor health outcomes, especially for autistic children (Lim et al., 2021). The added barrier of limited English proficiency can lead to delays in receiving services (Kim et al., 2023), which is particularly relevant for Asian-American immigrants as the fastest growing immigrant group in the US (PRC, 2021). An Individualized Family Service Plan (IFSP) is the first step in establishing early intervention (EI) services and for children an early autism screening is critical for early diagnosis (Nadel & Poss, 2007). It is essential to understand EI disparities for culturally and linguistically diverse (CALD) families.

Objectives:

Compare delays in receiving an IFSP past the 45-day due date and delays in screening for ASD (at 18 month and 24 months) by race (identifying as “Asian” compared to all other participants) and by primary language (those whose preferred contact language was something other than “English” compared to those who chose “English”) within a large cohort of Georgia EI data.

Methods:

Data was extracted from Georgia’s state-wide EI program, documenting participation between 2018 and 2022. For each enrolled family, EI providers entered sociodemographic information (e.g., race, ethnicity) and service milestones (e.g., IFSP start date). This study focused on a subset of 1,929 families identifying as Asian (1,479 with English as a primary language and 238 with a primary language other than English) compared to the remaining 50,353 identifying as a non-Asian race (39,530 having English as a primary language and 3,359 with a primary language other than English). The proportion of English to Non-English languages was significantly higher in the Asian cohort (12.3% of the Asian cohort compared to 6.7% for the Non-Asian cohort). Variables for race, primary contact language, IFSP delays (days past the 45-day due date), and ASD screening delays (days past 18 and 24 months) were analyzed using R 4.1.0 (R Core Team, 2021).

Results:

In the total sample, significantly higher IFSP delays were found in the overall Non-Asian compared to Asian cohorts ($p=0.013$). However, within the Asian cohort, the Non-English group had significantly higher delays than the English group ($p = 0.002$, Table 1). This difference in delays related to language was not observed within the Non-Asian cohorts ($p = 0.41$). Significantly higher delays in ASD screening at 18-months were found within the Asian cohort, for the Non-English group ($p = 0.03$). This difference across language groups was similarly not observed within the Non-Asian cohort ($p = 0.318$). However, at 24-months, delays were observed across the non-English group within the Non-Asian cohort ($p = 0.004$) but not the Asian cohort ($p = 0.26$).

Conclusions:

While disparities existed for Non-Asian cohorts compared to Asian, when evaluating disparities across race, one may miss potential disparities that exist for those with limited English proficiency. We observed specific delays in the Non-English language group with the Asian cohort. To better understand the mechanisms for these delays, more analysis is needed to ensure that EI services are supporting CALD families in receiving services for their autistic children.

**406.272 Area Deprivation Index in Autism: A SPARK Cohort Study**

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Background: Previous research on the impact on neighborhood disadvantage and autism has yielded inconclusive results primarily demonstrating differences in prevalence estimates in more disadvantaged areas and poorer health outcomes overall. These data suggest that children from disadvantaged areas generally experience poorer health outcomes due to lack of available medical care; however, specific mechanisms behind these differences have yet to be studied.

Objectives: The current study aimed to examine the Area Deprivation Index (ADI) in a national cohort (The Simons Foundation SPARK study). We specifically were interested in the effect of ADI on age of evaluation in this national ASD sample.

Methods: The SPARK Version 8 dataset (release date: June 3 2022), comprised of multiple parent questionnaires, was downloaded from SFARI base (<https://base.sfari.org>). A total of 27,928 children under the age of 18 years with ASD were studied. We examined the Area Deprivation Index as it allows for rankings of neighborhoods by socioeconomic disadvantage in a region of interest (e.g., at the state or national level). We chose to use the state level rankings as it allows for comparison a more geographically refined level. We conducted a linear regression to examine the effect of ADI on and age of evaluation in months.

Results: A linear regression analysis was conducted to examine the relationship between age at evaluation (in months) and the state rank decile for the ADI. The coefficient for age at evaluation was -0.51 , which was statistically significant ($t=-4.95$, $p<0.000$). Indicating that for each one-unit increase in the ADI state rank decile, the age at evaluation decreased by approximately 0.51 months. This result suggests a negative relationship between the deprivation index and age at evaluation, meaning that individuals from higher deprivation areas tend to be evaluated at a younger age. The overall model was statistically significant, $F(1, 27,928)=24.49$, $p<0.000$, indicated that the predictors collectively explained a significant portion of the variance in the ADI. However, the model's R^2 value was 0.0009, suggesting that only 1% of the variability in ADI is explained by the ADI rankings. Post hoc analyses will further examine additional predictors for ADI in the SPARK cohort.

Conclusions: In conclusion, the analysis indicates a significant negative relationship between age at evaluation and the ADI state rank decile. While the direction of the relationship suggests that higher deprivation (higher ADI percentile) might be associated with slightly younger ages at evaluation, this effect is small. Given the extremely low R -squared value, this model does not provide strong evidence that socioeconomic deprivation as measured by the ADI is a meaningful predictor of the age at evaluation for a research-based population. The fact that families in this study were part of research study biases the sample to those who may be accessing resources better. However, further investigation with additional predictors may be warranted to better understand the factors influencing ADI in this cohort.

406.273 Ask Me What I Think: Understanding the Needs of Autistic Middle and High School Students

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Background: Autistic youth have increased mental health challenges, such as depression, anxiety, and suicide (Howe et. al, 2020) along with poor postsecondary and long-term outcomes in areas like social engagement, employment, and quality of life (Kraemer et al., 2019). In the United States, the public school system is the primary setting in which autistic youth receive services (Brookman-Frazee et al., 2009). However, there are limited school-based evidence-based practices (EBPs) designed to adequately support autistic middle and high school students (Kucharczyk et al., 2015; Locke et al., 2024). One challenge in implementing efficacious school-based EBPs is the absence of reliable tools to evaluate the needs of autistic students and the resources they utilize.

Objectives: The goal of this presentation is to understand identified areas of unmet need from autistic adolescents in middle and high schools, as well as the critical supports that public middle and high schools ought to provide to support their needs.

Methods: We included autistic adolescents in the design of a survey which was later distributed to autistic students to gain insights into their perspectives and needs in middle and high schools. Thirty-four autistic adolescents in middle and high school (67% male, 79% white, average age=13.1, average grade=7.4) completed a "How Can We Support You" survey electronically via Research Electronic Data Capture (REDCap). The survey was designed in partnership with an autistic advisory board. Design modifications included: icons, definitions of core constructs, questions about desired areas for improvement in school, supports they currently receive and would like to access, and how effectively their needs were being met in school. For this presentation, we focus on the areas of identified need. Participants received \$20 for completing this survey, which took approximately 15 minutes to complete.

Results: Autistic adolescents in middle and high school primarily identified mental health and executive functioning as their top areas of need, prioritizing these over academics, behavior, and daily living skills. Specific areas of identified executive functioning needs included attention challenges, time and task management, and mental health needs included addressing mood and anxiety. Very few students indicated that they do not want support from their schools in any areas of need that were identified.

Conclusions: As a field, we ought to listen to and include autistic voices throughout the research process. We have much to learn from the autistic community. We posit the following tips and potential solutions to improve support for autistic adolescents in middle and high schools: 1) public middle and high schools need to prioritize mental health and executive functioning for autistic adolescents; 2) intervention developers need to redesign evidence-based efficacious mental health and executive functioning programs for use in middle and high schools, because there are not enough programs to effectively address these needs; and 3) autistic adolescents should be included in the design process of these programs, and one method to achieve this is by conducting surveys or assessments to collect their input on their needs.

406.274 Assessing the Information Needs and Support Methods for Caregivers of Children with Developmental Disabilities: A Focus on Media and Digital Resources

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Background: This study addresses the increasing prevalence of developmental disabilities, the growing need to support and empower caregivers of children with developmental disabilities, and the rising demand for remote services among these caregivers. However, caregivers often face challenges in accessing reliable and accurate information online, making it difficult to find resources that meet their specific needs. Therefore, it is crucial to understand caregivers' current usage patterns and specific needs for remote services to develop tailored resources that effectively support this population.

Objectives: The study aimed to evaluate the needs and preferences of caregivers of children with developmental disabilities across four key areas: general information about caregivers and children, methods of acquiring developmental disability-related information, usage of YouTube video content, and experience with mobile apps specifically designed for caregivers of children with developmental disabilities. Insights gained from this research will inform the development of practical strategies for future app development to effectively support caregivers.

Methods: A nine-month online survey was conducted from January to September 2024, targeting caregivers of children aged 3 to 12 years with developmental disabilities. The survey, designed to assess caregivers' needs and experiences, was distributed through various channels such as outpatient clinics, the developmental center's homepage, interactive events, and community sharing to ensure broad coverage. Descriptive analysis was employed to quantify the preferences and experiences of caregivers, with results presented in proportions.

Results: Among the 82 respondents, the majority were mothers of children aged 3 to 12 with Autism Spectrum Disorder (ASD), intellectual disability (ID), or other developmental disorders (Table 1). They primarily accessed information through website searches (25.6%) and YouTube (19.5%). The most preferred methods were internet posts or video subtitles (36.6%) and videos (35.4%). Although over 70% of respondents frequently used YouTube due to its accessibility and diverse content, their overall satisfaction was low (37.1%). This was because of the unreliability and lack of specificity in the content, which often failed to meet their children's needs (Table 2), highlighting YouTube's limitations as a reliable information source. The most frequently sought information focused on enhancing language and communication skills (23.2%), supporting daily living and self-care abilities (23.2%), and fostering social interaction and peer relationships (22.0%). The most frequently requested video topics were related to children's development, including language, social, and cognitive skills (35.4%). Additionally, respondents expressed a strong interest in a mobile app featuring practical tools such as daily routine management and behavior guidelines (41.5%).

Conclusions: The study highlights that caregivers of children with developmental disabilities urgently need reliable, customized digital resources, particularly those focusing on language, social skills, and daily living skills. Addressing these needs requires the development of verified, tailored solutions that offer practical support tools. Resources that offer structured guidance on daily routines and behavior management, for instance, could significantly enhance caregivers' ability to support their children effectively. Incorporating these elements into a mobile app specifically designed for caregivers could potentially provide a practical, accessible, and convenient way to meet these needs.



406.275 Associations between the Timing of Early Intervention/Early Childhood Special Education Relative to the Timing of Autism Diagnosis and Caregiver Mental Health: Findings from the National Survey of Children's Health 2016-2020

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Background:

Early Intervention (EI) and Early Childhood Special Education (ECSE) are important for children suspected of autism. However, the timing of EI/ECSE relative to autism diagnosis and its impact on caregiver mental health are not well understood. We hypothesized that the timing of receiving EI/ECSE before versus after autism diagnosis may influence the developmental trajectory of autistic symptoms and thus impact caregiver mental health.

Objectives:

To estimate the proportions of children receiving EI/ECSE before versus after autism diagnosis and the proportions of caregivers with "good" and "poor" mental health status. To examine associations between EI/ECSE timing and caregivers' mental health while controlling for other characteristics.

Methods:

Analysis used the National Survey of Children's Health (NSCH) (2016-2020), including children aged 2-8 years with an autism diagnosis who received EI/ECSE (N=1,151). Caregiver questionnaires asked about EI/ECSE timing, caregivers' mental and physical health status (dichotomized into "good" =excellent/very good/good or "poor" =fair/poor), and demographics. Survey-weighted logistic regression models examined associations between EI/ECSE timing and caregiver mental health, controlling for covariates.

Results:

Approximately 27.7% (95% CI [22.4%, 32.9%]) of children received EI/ECSE before autism diagnosis. Caregivers' mental health was reported as "Good" for 89.3% and "Poor" for 10.7%. EI/ECSE timing relative to autism diagnosis was not associated with caregivers' mental health (aOR = 1.2, 95% CI [0.6, 2.5]). Factors associated with decreased odds of "Good" mental health included whether the child currently has autism (aOR = 0.13, 95% CI [0.03, 0.6]), has ever received special services to meet the child's developmental needs such as speech, occupational, or behavioral therapy (aOR = 0.06, 95% CI [0.05, 0.9]), and higher education level versus high school and less (some college: aOR = 0.17, 95% CI [0.04, 0.6]; college degree: aOR = 0.14, 95% CI [0.03, 0.6]). Caregivers' "Good" physical health strongly predicted "Good" mental health (aOR = 30.8, 95% CI [13.0, 73.3]). Child age and sex, current EI/ECSE receipt status, insurance coverage, age of autism diagnosis, having received autism treatments in the past 12 months, currently taking autism medications, caregivers' employment, government assistance (cash and food stamps), and caregiver-reported emotional support with parenting showed no associations with caregivers' mental health.

Conclusions:

The timing of receiving EI/ECSE before autism diagnosis was not associated with the caregiver's mental health. Current autism diagnosis, receipt of special services, and higher parental education level were associated with decreased caregiver mental health. Caregivers' good physical health has the strongest association with their good mental health. It is notable that a child receiving special services/therapies, which is typically considered a supportive factor, was associated with decreased caregiver mental health, reflecting the challenges faced by caregivers of autistic children with complex needs. Future research should explore additional mechanisms to support caregiver mental health throughout the autism diagnosis and intervention process.

406.276 Autism Assessment Confidence and Knowledge Change Among Primary Care Providers Trained to Provide Diagnostic Evaluations

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Background: Early autism diagnosis often enables U.S. children and their families to access important services and supports. Unfortunately, workforce shortages in professionals qualified to conduct such diagnostic evaluations contribute to long waits for many families. To address this, primary care providers (PCPs) are increasingly being trained to deliver such care within the medical home.

Objectives: We evaluated changes in autism assessment confidence and knowledge among PCPs participating in a 36-hour training course designed to prepare them to deliver diagnostic evaluations of patients ages 18 to 47 months suspected of having ASD in their medical home. This program is part of a Medicaid strategy to increase access for marginalized populations.

Methods: Twenty-four PCPs were enrolled (see Table 1 for demographic characteristics). Training included completion of an asynchronous online autism training available through the American Academy of Pediatrics and a two-day in-person training during which the PCPs learned to administer the Screening Tool for Autism in Toddlers and Young Children (STAT), and a diagnostic interview based on the DSM-V autism criteria. A self-administered electronic survey was used pre- and post-training to determine autism evaluation confidence and knowledge. The Primary Care Autism Self-Efficacy (PCASE) survey was adapted to measure PCP confidence in the following six domains: autism screening and identification, assessment, referral, testing, concurrent psychiatric condition management, and additional areas (e.g., providing anticipatory guidance, partnering with families). The 36 PCASE items were rated on a six-point Likert-type scale, with a score of one indicating no confidence and a score of six indicating highly confident/expert. The PCASE full scale and subscales demonstrated good internal consistency reliability ($\alpha = 0.85$ to 0.94). Autism knowledge was measured using the following two items: "How knowledgeable are you about autism?" and "Generally, how knowledgeable are primary care providers about autism?". These two items were each rated on a five-point Likert-type scale with a score of one indicating strongly disagree and a score of five indicating strongly agree. Given the distributional properties of the variables, we computed descriptive and bivariate statistics along with paired t-tests and Cohen's D.

Results: PCASE results demonstrated a statistically significant ($p < .05$) increase in PCP confidence with autism assessment for the total score and five of the six subscales (see Table 2). In addition, a statistically significant increase was found in PCPs' mean knowledge about autism.

Interestingly, the mean general knowledge of PCPs was at follow-up versus baseline, though this difference was not statistically significant.

Conclusions: Results suggest improvements in PCP autism assessment confidence and knowledge between baseline and follow-up, consistent with other research involving training PCPs to complete such diagnostic evaluations. Future Autism Assessment Capacity Project (AACP) research will include analyzing data from an additional PCP follow-up survey (post ECHO series) and integrating these PCP survey findings with patient assessment data gathered toward the end of training activities. This and other similar PCP training initiatives may help increase access to timely autism diagnostic services for U.S. children.



406.277 Autism Care Continuum: Exploring Specialty Services across the Lifespan within U.S. Academic Medical Centers

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Background: Autistic people experience disproportionately high rates of co-occurring mental health problems both in general and in adulthood (Lugo-Marín et al., 2019; Uljarević et al., 2020), contributing to increased healthcare utilization and costs (Ames et al., 2021; Zerbo et al., 2019). Yet, autistic people—particularly adults—often report high unmet service needs in the face of mental healthcare access barriers (Nicolaidis et al., 2013) including geographic limitations (Drahota et al., 2020), shortage of trained clinicians who feel confident working with this population (Maddox et al., 2020), and the absence of an integrated delivery system (Maddox et al., 2021). Despite preliminary evidence for high and unmet service needs in the autistic population, we lack empirical evidence on the prevalence and accessibility of autism specialty services in the United States. This is true even for those services affiliated with academic medical centers (AMCs), generally recognized for their cutting-edge research and high-quality healthcare services.

Objectives: We aim to identify and characterize autism specialty services provided by U.S. AMCs along the east and west coasts to identify potential gaps in service provision in what may represent the strongest available specialty services for autism. Specifically, we aim to highlight gaps in care by age groups and types of services offered.

Methods: The study team screened the Centers for Medicare & Medicaid (CMS) 2023 Reporting Cycle Teaching Hospital List for hospitals that qualify as an AMC. To qualify, hospitals needed to be directly affiliated with a university or college located on the U.S. east or west coasts. The study team conducted a systematic online search of each qualifying AMC to identify whether it has a department and/or clinic/program that advertises autism-focused services. Data were extracted from AMC service line websites to document types of services provided to autistic people and age ranges of eligibility for each. This study focused on description of intensive population-based data collection; thus, descriptive summary statistics were utilized to characterize types of services offered and age ranges of eligibility.

Results: A total of 121 AMCs along the east and west coasts of the U.S. were identified from the CMS list. From these institutions, 67 departments and clinics/programs were found to offer autism specialty services. Most departments and clinics/programs served the pediatric population (73%), only 7% focused on adults. The most common type of service offered is diagnostic assessment. See Figure 1.

Conclusions: At AMCs that provide autism specialty services, the vast majority of clinical efforts are focused on autistic youth. Few centers provide specialized services dedicated to adults, supporting the idea of a "service cliff" for the post-pediatric population (Roux et al., 2015). Of the types of services offered across age ranges, diagnostic assessments are the most common. Few centers offer post-diagnostic support and specialist care, and this service gap is even greater for autistic adults. This study highlights startling disparities in the provision of autism specialty services, particularly for autistic adults, even at institutions that are expected to provide among the strongest empirically-based services for autistic people.



406.278 Autism Diagnoses in Primary Care: Echo Autism Washington

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Background:

Project Extension for Community Healthcare Outcomes (ECHO) is a telementoring program that connects primary care providers (PCPs) with subject matter experts (SMEs). ECHO™ sessions include PCP case presentations and SME didactics aimed at enhancing PCP capacity for specialized care. Autism spectrum disorder (ASD)-focused ECHOs began at the University of Missouri and have demonstrated success in increasing PCP self-efficacy, adherence to ASD screening guidelines, and diagnostic capabilities (Mazurek et al., 2017; Sohl et al., 2017; Gerds et al., 2024).

Objectives:

This pilot exploratory study evaluates the impact of PCP participation in *ECHO Autism Washington* on PCP capacity for diagnosing ASD and delivering ongoing care. The study compares the diagnostic experiences and access to care for families whose children received ASD diagnoses from *ECHO Autism Washington* PCPs versus those diagnosed at a specialty clinic in Seattle, WA.

Methods:**Provider Survey**

ECHO PCPs ($n=13$) completed a survey about diagnostic services provided to patients about whom they discussed during an *ECHO Autism Washington* case presentation. The survey contained questions about PCP practice patterns, ASD diagnostic methods, and subsequent care.

Caregiver Survey

ECHO PCPs distributed a survey to caregivers of patients diagnosed with ASD during or after their participation in ECHO (ECHO Caregivers). Caregivers of patients diagnosed at a specialty clinic served as a comparison group (Clinic Caregivers). Seven ECHO Caregivers completed the survey and were matched demographically with seven Clinic Caregivers from a pool of twenty-nine. The survey included a modified Patient Satisfaction Questionnaire-18 (PSQ-18; Marshall & Hays, 1994), demographic questions, and questions about services accessed post-diagnosis.

Results:**Provider Survey**

The most commonly recommended services by PCPs during initial diagnoses included special education, applied behavior analysis, speech-language pathology, and occupational therapy (69%). Additionally, 69% of ECHO PCPs continued care after diagnosis, which included mental health services, support with pursuing Developmental Disabilities Administration services, revisiting applied behavior analysis, working with school districts, transitioning to adult care, guardianship discussions, sleep hygiene, and school attendance.

Caregiver Survey

A Welch two-sample t-test compared PSQ-18 scores between ECHO and Clinic Caregivers. Although not statistically significant ($t(11)=0.93$, $p=0.37$), ECHO Caregivers reported higher satisfaction ($M = 1.62$, $SD = 0.95$) compared to Clinic Caregivers ($M = 1.17$, $SD = 0.86$), with an effect size of Cohen's $d=0.50$ indicating a medium effect.

Another exploratory Welch two-sample t-test compared wait times (time from initial developmental concern to ASD diagnosis) between groups. No significant difference was found (ECHO: $M=33.86$ months, $SD=34.01$; Clinic: $M=46.00$, $SD=61.51$; $t(7)=-0.43$, $p=0.68$), although Clinic Caregivers reported longer wait times (Cohen's $d=0.25$, small effect).

Additional analyses will be presented within the poster.

Conclusions:

This pilot study suggests that families may experience slightly higher satisfaction with ASD diagnostics and somewhat reduced wait times when receiving local care from *ECHO Autism Washington* PCPs. Findings suggest that caregivers were equally satisfied with PCP vs. specialty care diagnostics, and ECHO PCPs may be well-situated to follow-up on care recommendations and provide continued support for families. However, more research is needed given the exploratory nature of analyses.

406.279 Autism Screening in a Large, Diverse Primary Care Setting

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Background: Although universal screening for autism spectrum disorder (ASD) in toddlers is recommended and promotes early evidence-based intervention, barriers to screening and referral persist, particularly for minoritized children. One strategy to address this challenge is to integrate systematic screening into primary care, but there are concerns about adding workload and inefficiencies into the already stressed primary care system, especially for those clinics serving diverse and high needs families. Indeed, much of research examining autism screening in primary care has taken place in clinics serving majority non-minoritized populations. The Building Early Connections (BEC) program, housed at an academic medical center located in the heart of Chicago's historically underserved West Side community, sought to address these concerns by leveraging automated electronic health records (EHR) workflows and decision algorithms to support efficient and equitable autism screening.

Objectives: The goal of this work is to increase access to autism-specific screening and referral, improve tracking and documentation of screening results, and limit the burden on primary care physicians.

Methods: Beginning in 2020, BEC embedded the Survey of Well-Being for Children (SWYC), including the autism-specific screener the Parent's Observation of Social Interaction (POSI), into the EHR across five large primary care clinics in the RUMC system. The EHR pre-visit questionnaire functionality was used to automate screener selection, distribution, and scoring of the tool prior to well-child visits. Screening results and interpretation automatically populated into EHR notes before the visit to enable more focused discussion about findings and next steps with families. Automated clinical decision support ensured proper referral pathways for positive screening. Screening and referral data for children ages 18 to 30 -months were collected and analyzed from the EHR for the 34-month period after project implementation. Visit efficiency was tracked using Press Ganey Top Box scores.

Results: The sample consisted of 7,247 children (85% minoritized backgrounds, 57% public health insurance). Twenty two percent of these children screened positive on the POSI. Of those who screened positive, 26% were immediately referred for internal behavioral health supports and 22% were immediately referred to external Part C Early Intervention services. Press Ganey Top Box scores for moving through your visit increased from 81.6 in 2020 to 86.7 in 2022 which may be used as a proxy of measurement for increasing well child visit efficiency.

Conclusions: BEC successfully automated autism screening and referral pathways into the EHR in a way that did not add burden to the existing workflows and improved efficiency of well-child visits. This work offers an important contribution to the literature by describing implementation of systematic autism screening in primary care clinics serving majority minority populations

406.280 Autism Stigma: How Interactions in Childcare Centers Limit Information Sharing and Delay Autism Screening for Children
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Background:

Autism screening in toddlers is based on caregiver report of a child's usual behaviors. In addition to parents, early childhood education providers (ECEPs) and directors in childcare settings may be critical informants about children's development and behavior. Stigma theory suggests that interactions about social identities that have been 'discredited' – such as autism – can lead to rejection and social isolation, not only for the person with the discredited identity, but also those close to them, including caregivers and family members. However, little is known about how parents', directors', and ECEPs' beliefs reinforce or attenuate autism stigma, and how these processes might hinder or help early detection of autism.

Objectives:

Use qualitative methods to investigate interactions between ECEPs, directors, and caregivers that may influence autism screening in childcare settings.

Methods:

We conducted semi-structured interviews (n=6 caregivers, 5 ECEPs, 2 directors) and field observations (n=4) within two childcare centers, along with accompanying field notes. Interviews were audio-recorded and transcribed verbatim and a coding scheme was established based on precoding summaries using all transcripts; coders achieved interrater reliability ($\kappa \geq 80\%$). Next, we used qualitative data analysis software (NVIVO) to code transcripts and conducted thematic analysis using the extended case method yielding insights at taxonomic, thematic, and theoretical levels.

Results:

Informational exchanges about developmental delays and autism among caregivers, ECEPs, and directors formed a triad characterized by limited exchanges between ECEPs and caregivers, robust exchanges between ECEPs and directors, and carefully mediated exchanges between directors and caregivers (Figure 1). The ways in which ECEPs carefully managed the flow of information to caregivers, such as actively avoiding the term "autism", implies underlying stigma dynamics. Findings from thematic data analysis also indicated that caregivers exercised agency in how they responded to efforts by ECEPs or directors to investigate their child's potential developmental delays or autism. We identified four types of caregiver responses of varying levels and dimensions of stigma from two groups of caregivers whose children were or were not experiencing behavioral challenges (Table 1). Three types of caregiver responses were identified for children experiencing behavioral challenges, including "Yes, let's talk about autism", "Yes to general services but no to autism diagnosis", and "Refused discussion about autism or services". One type of response was identified for children not experiencing behavioral challenges, including "Yes, open to screening". Stigma levels varied from high to low, and responses that initially exhibit lower perceived stigma also indicate the awareness of the potential stigmatizing impact of autism. This awareness was revealed either by participants taking a supportive role in better understanding autism or by avoiding association by not looking into autism screening or assessment.

Conclusions:

ECEPs have a unique relationship with the caregivers and children that they serve. Caregivers' responses to ECEP's communicating child development concerns vary widely and include apprehension, hopefulness, confusion, and denial. The bidirectional relationship between ECEPs and caregivers can facilitate access to intervention services but is heavily impacted by stigma. Future research should explore this relationship in childcare centers across different geographical locations and populations.



406.281 Policy Priorities of Autism Communities in Europe

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Background: Despite increasing rates of autism prevalence and diagnosis worldwide (Zeidan et al., 2021; Russell et al., 2021), autistic people in Europe still experience serious challenges in various aspects of life (Malik-Soni et al., 2022; Vogan et al., 2017). Significant changes are essential in improving autistic people's experiences, meeting their needs and protecting their rights in diverse areas ranging from education (Platos and Pisula, 2019) to social inclusion (Holmes, 2024).

Objectives: We conducted the 10 Points for Change study to understand the priorities and needs of the autism community in Europe. Outcomes from the study will be used to identify the top 10 priority areas for change for autistic people, reported by autistic participants, carers and professionals in autism-related organisations.

Methods: Our study included two phases – a series of focus groups that helped outline topics of importance among autistic people, and an online survey investigating participants' experiences and suggestions for change with regards to these topics. Following three focus groups, each involving 5-6 autistic people and/or parents of autistic people, we shortlisted 19 areas of priority for autistic people (see **Fig. 1**). The online survey, open from November 2020 to February 2024, recruited autistic participants, parents/carers and people working in the field of autism aged 16 or above and residing in European Union (EU) member states and the United Kingdom (UK). Participants were asked to 1) indicate which areas needed to change for autistic people, 2) explain their experiences in the selected areas, 3) describe suggestions for improvements in these areas, and 4) rank all 19 areas of priority in order of importance. Questions 3 and 4 were open-ended.

Results: Overall, 1,706 participants from the EU and the UK completed the survey (mean age 41.68, age SD 13.33, age range 16-97; 27.90% male, 65.59% female; 6.51% other gender; 47.57% autistic individuals, 35.67% parents/carers, 16.76% members of autism-related organisations). Most participants indicated public awareness and understanding of autism as a crucial area for change (83.15%; see **Fig. 2**) followed by education (82.97%), employment (80.40%), mental healthcare (78.58%) and social inclusion/support (73.90%). However, when asked to rank all 19 themes in order of importance for change (1 = most important, 19 = least important, so the mean rank might not necessarily reflect how many people indicated an area as critical for change), education was of highest priority (mean rank 4.95) followed by government funding for autism-specific services (6.11), public awareness and understanding of autism (6.61), employment (6.75) and social inclusion/support (8.44). Further analysis will be performed on participants' responses on experiences and suggestions for change.

Conclusions: It is crucial for us to listen to the experiences of autistic people, carers and professionals in the field of autism and seek their suggestions for improvement to enhance autistic people's quality of life. This study indicated that significant changes are needed to services, social support and awareness, and the findings will be presented to EU policymakers to inform the design of policies that will better serve the autism community in Europe.



406.282 Autism-Related Services As a Predictor of Quality of Life in Autistic Adolescents

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Background: Understanding factors related to autistic adolescents' quality of life is critical to informing clinical practices that effectively improve adolescent subjective well-being, yet most of the research examining autism-related services has focused on changes in autism symptoms (Chezan et al., 2022; Gerber et al., 2011). Further, there is limited research examining quality of life in autistic, gender-diverse samples.

Objectives: The aims of this study were to (1) characterize parent-reported adolescent quality of life (PRA-QoL) and autism-related services from parents of autistic adolescents who are gender-diverse or cisgender, and (2) examine enrollment in autism-related services as a potential predictor of PRA-QoL.

Methods: Data were drawn from a larger-scale survey-based study of parents whose adolescents are autistic, gender-diverse, autistic and gender-diverse, or non-autistic and cisgender. Parents of autistic adolescents who are gender diverse or cisgender ($n = 45$) were included. Measures examined in the secondary analysis included the parent report version of the Peds Quality of Life Inventory Generic Core Scales (PedsQL; Varni, 1998) and descriptive questions for parents regarding autism-services their adolescent was receiving. Analyses included descriptive statistics and regression analyses. In addition to examining autism-related services as a predictor of overall PRA-QoL, descriptive and exploratory analyses characterized these factors and the influence of autism-related services on the PedsQL subscales (e.g., emotional, social, academic, and physical functioning).

Results: Sixty-two percent of parents (62.2%) in this sample reported that their adolescent was receiving autism-related services, with a greater percentage of parents in the cisgender autistic adolescent group reporting services compared to parents of autistic, gender diverse adolescents. There was variability in the type of services being received, with many parents reporting multiple concurrent services. The most reported services included mental health treatment (42.9%), occupational therapy (32.1%), behavioral therapy (32.1%), speech and language therapy (21.4%), academic services (21.4%), and social support services (21.4%). Mean parent reported adolescent quality of life scores on the PedsQL were in the below-average range ($M = 49.36$) with a standard deviation of 12.87. Regression analyses indicated that autism-related services significantly predicted PRA-QoL, $F(1,43) = 7.60$, $R^2 = .15$, $p = .009$, with enrollment in autism-related services being associated with higher PRA-QoL.

Conclusions: Most parents reported that their adolescents were receiving autism-related services and that their youth were engaging with multiple services. Enrollment in autism-related services positively predicted current parent-report adolescent quality of life. These data suggest that community-based services may have a positive impact on quality of life in autistic adolescents. Broadly, this research contributes to the literature on QoL for autistic adolescents, especially in gender-diverse samples, which is understudied. Importantly, data for this study were captured at a single time point, limiting the ability to infer directionality of relationships, and were based on informant report. Important next steps include longitudinal study designs and the collection of self-reported adolescent quality of life.

406.283 Barrier and Facilitator Beliefs about Providing Ongoing, Integrated Care for Autistic Children and Their Families: A Qualitative Exploration of Community Pediatricians' Perspectives in Ontario

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Background: Autistic children and their families report a high need for ongoing, integrated, and family-centered care to support their needs throughout their care journey. Community healthcare providers (HCPs) are uniquely positioned to fill this service gap due to their early and ongoing connections with families. However, many community HCPs do not feel equipped to provide this care. Project ECHO Autism (Extension for Community Healthcare Outcomes) is an evidence-based program that builds capacity for best-practice autism care in community settings, and offers an opportunity to educate and support community HCPs in providing ongoing integrated care. Understanding community HCPs' barrier and facilitator beliefs about providing ongoing integrated care can help to inform strategies to best support and empower community HCPs, and using a framework rooted in behaviour change such as the Theoretical Domains Framework (TDF) facilitates this process.

Objectives: Identify community pediatricians' barrier and facilitator beliefs about providing ongoing integrated autism care.

Methods: Eight general pediatricians (6 female; 2 male) practicing in seven health regions across Ontario participated in semi-structured focus groups over Zoom. Interview questions were guided by the TDF. Two coders first identified barriers and facilitators to providing ongoing integrated care. Barriers and facilitators were then mapped onto one of the 14 domains of the TDF. For each barrier and facilitator, a belief statement was generated to convey the central underlying belief based on participant responses. Coding and belief statements were checked and discussed between the two coders.

Results: We identified a wide range of barrier and facilitator beliefs about providing ongoing integrated care. Several barriers and facilitators were identified in the *Knowledge, Social and Professional Role, Beliefs about Consequences, and Environmental Context and Influences* domains of the TDF. Some notable barrier beliefs were related to a lack of in-depth knowledge about the service landscape, challenges in setting boundaries and defining responsibilities in community-based practice, the lack of guidance in service navigation, and the confusing and constantly changing nature of the service system. Some beliefs that facilitate the provision of ongoing integrated care included how ECHO Autism provides a source of knowledge for resources and tools for managing co-occurring conditions with autism, understanding one's role in navigating and coordinating services for families, as well as the belief that ongoing care is valuable in a family's care journey.

Conclusions: Our findings suggest there are many possible barrier and facilitator beliefs to address in supporting community HCPs in their ability and confidence to provide ongoing integrated care. For instance, a comprehensive resource with up-to-date information about services in a community could be valuable in helping community HCPs navigate the confusing and changing service landscape. With these results, our team will consult with broader knowledge users, including autistic advocates and families, to develop toolkits supporting ongoing autism care.

406.284 Barriers and Facilitators to Suicide Risk Screening for Autistic Youth

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Background: Routine suicide risk screening has been recommended across US pediatric care settings. However, the needs of autistic youth are rarely considered, and disparities in the implementation of screening across autistic and non-autistic youth exist. While essential to inform strategies to promote implementation, data are limited on barriers and facilitators to suicide risk screening for autistic youth.

Objectives: We used a mixed method research design to elucidate possible implementation challenges focusing on the perspectives of mental health (MH) clinicians and caregivers, since barriers perceived by these individuals may prevent screening.

Methods: Sixty-five MH clinicians serving 7-to-17-year-olds completed an online survey inquiring about their experience with and attitudes toward suicide risk screening for autistic and non-autistic youth. Forty-five caregivers of autistic youth also completed a survey on their experience with and attitudes toward screening. Twenty percent of respondents were subsequently selected to participate in qualitative interviews. Quantitative data were analyzed descriptively. Factors related to perspectives were further explored using Chi-squared tests, *t*-tests, and non-parametric tests when indicated. Results will be updated and extended to include qualitative findings after data collection ends in January 2025.

Results: Despite reporting having less training and lower confidence when screening autistic compared to non-autistic patients ($p<0.001$), nearly all clinicians (98.2%) reported screening experience with both groups, and screening primarily when suicide symptoms are present or suspected (autistic patients: 75.4%; non-autistic patients: 77.2%). Clinicians were more likely to screen non-autistic compared to autistic patients because suicide risk factors are present ($p=0.046$) and because screening is part of their routine, required by leadership, and encouraged by national guidelines/recommendations (all $p<0.006$). Alternatively, clinicians more strongly agreed that they may not screen autistic compared to non-autistic youth for the following reasons: presenting concern is not suicide-related, discomfort using available screening tools, limited availability of a screening protocol, and limited referrals and resources when risk is identified (all $p<0.009$). Regarding caregiver perspectives, 65.1% reported that their child had been screened previously. Youth who were younger, had not experienced suicide symptoms, and had not received outpatient MH services were less likely to be screened (all $p<0.03$). Most caregivers (63.6%) believed clinicians should screen at every visit. While most reported comfort with screening (81.8%), comfort levels varied by whether the child had a co-occurring psychiatric diagnosis ($p=0.015$). Most common reasons for discomfort were worry their child will become distressed, fixate or hyperfocus on suicide-related topics, and ask questions the caregiver is unable to answer following screening.

Conclusions: Caregivers are largely comfortable with suicide risk screening and support more regular screening than clinicians endorse implementing. The fact that clinicians primarily screen autistic and non-autistic youth when presenting concerns are suicide-related is problematic, as autistic youth with suicide risk often have diverse MH presentations. Therefore, clinician education is warranted. Reported caregiver concerns should also guide community education efforts and future research on iatrogenic risk specific to autism. Organizational (e.g., availability of a screening protocol, leadership support) and systems-level (e.g., lack of referral options) barriers were noted and require urgent attention to promote care advancements.

406.285 Battling the Bottleneck for Autism Spectrum Disorder Diagnosis: Long-Term Follow-up of Primary Care Community Trainees

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Background: Primary Care Practitioners (PCPs) in the US widely do not diagnose ASD (Martinez et al., 2018). Solely referring families to ASD specialty clinics with long waiting lists results in delayed identification and access to supports and intervention. Efforts to train PCPs in streamlined ASD diagnosis within Primary Care (PC) are growing (Ahlers et al., 2019; Hine et al., 2018, 2020).

Objectives: The study aimed to understand the long-term outcomes of PC trainees in a study replicating the methods of Hine and colleagues. Participants were trained in streamlined ASD diagnosis of “uncomplicated” (i.e., high screening scores and low comorbidities) toddlers and participated in a year-long learning community about ASD, which consisted of topical meetings and case consultations monthly.

Methods: PCP (n=9) trainees were recruited from a mid-sized midwestern city and consented utilizing an Internal Review Board-approved protocol. See Table 1 for demographics. Participants completed online demographics and an adapted version of the Practice Behavior Questionnaire (PBQ: Hine et al., 2021) pre STAT™ (Screening Tool for Autism in Toddlers & Young Children) initial training sessions, and one year later. The adapted PBQ assessed: knowledge of screening/diagnosis of ASD, intention to diagnose ASD, attitudes on appropriateness of PC ASD diagnosis, comfort level with ASD, and number of children evaluated for ASD using the STAT in the primary care setting.

Results: Data presented here refers to pre STAT™ training and at long-term follow-up, one year after STAT training and learning community participation. From pre to follow-up, trainees’ attitudes shifted to rating in-house ASD diagnosis as more appropriate, $t(8) = -2.00, p < .05$, Cohen’s $d = .67$, and rated feeling more comfortable distinguishing ASD from general developmental concerns ($t(8) = -2.53, p < .05$, Cohen’s $d = .84$); and making a formal ASD diagnosis ($t(8) = -8.49, p < .05$, Cohen’s $d = .283$). However, trainees reported feeling *less* comfortable over time connecting families of autistic children to mental health services ($t(8) = 2.31, p < .05$, Cohen’s $d = .77$). Trainees were more likely to endorse attempting an in-house diagnosis vs. referring a patient to a specialist one year after STAT™ training [Wilcoxon rank(9) = $-2.5, p < .05$; 22% likely to attempt in-house diagnosis at pre compared to 88% likely at follow-up]. Rates of in-house ASD diagnoses significantly increased one year following the initial training ($t(8) = -1.941, p < .05$, Cohen’s $d = .65$).

Conclusions: ASD diagnostic training improved ASD attitudes, knowledge, and numbers of children diagnosed with ASD in PC. Trainees were less confident in their ability to connect families of autistic children to mental health services, perhaps reflecting the many discussions had at monthly meetings about the limitations of available mental health services specific to the ASD population in the area. Trainees at an FQHC serving non-English speaking families showed the most increases and fewest barriers to incorporating ASD diagnosis in PC. ASD diagnosis and care within PC, in place of the bottleneck of specialty clinic wait-lists, has potential for improving and streamlining diagnostic flows and awareness of available supports, especially for marginalized populations who experience inequities in access to ASD care.



406.286 Best Practice Guidelines for the Identification and Care of Individuals with Autism: An Evaluation of Clinical Practices and Service Acquisition

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Background: Evidence-based practice guidelines support providers in the provision of care that leads to the most favorable outcomes. However, these outcomes are predicated on providers' adherence to such guidelines, as well as patients' follow-through with clinical recommendations. Chart-review studies suggest that not adhering to practice-based guidelines at the points of autism screening and diagnostic evaluation at least partially explains the autism-detection gap (i.e., the time between first concerns about behavior/development and eventual diagnosis). It is possible that inactions/delays at other steps in this process (e.g., referrals for intervention, completion of referrals) further impede care. However, little is known about how often real-world pediatric practice adheres to evidence-based guidelines in the identification and management of autism.

Objectives: To evaluate autism screening, diagnosis, and referral patterns among a pediatric patient cohort in Texas Children's Pediatrics (TCP), one of the largest primary care pediatric healthcare systems in the U.S., as well as these patients' completion of referrals.

Methods: We examined health records of children (aged 16-36 months) seen in any Houston-based TCP practice for either well-child or sick visits between July 1, 2022, through June 30, 2023. From these charts, we quantified 55,565 unique patients and stratified by scores from all available administrations of the *Modified Checklist for Autism in Toddlers* (M-CHAT). We also assessed child age and visit type at each M-CHAT (i.e., well-child vs. sick), and child demographics. Results were analyzed descriptively.

Results: Among the 55,565 children, 51,736 (93.1%) received a first M-CHAT (M age = 20.1 months, $SD = 3.6$), 36,957 (66.5%) received a second M-CHAT (M age = 25.3 months, $SD = 2.7$), and 4,282 (7.7%) received a third M-CHAT (M age = 30.5 months, $SD = 3.3$). 978 (1.9% of 1st M-CHAT), 687 (1.9% of 2nd M-CHAT), and 126 (2.9% of 3rd M-CHAT) scored as high risk for autism (>7), which calls for immediate autism assessment or referral for autism-specialist evaluation. 3,103 (6.0% of 1st M-CHAT), 1,561 (4.2% of 2nd M-CHAT), and 285 (6.7% of 3rd M-CHAT) scored as moderate risk for autism (3-7); these children should receive the M-CHAT follow-up interview to guide referral recommendations. Proportions of M-CHAT completion among eligible children, score distributions, visit types for M-CHATs, and demographic information is in Table 1.

Conclusions: First M-CHAT screening rates were high (93.1%) and most occurred during well-child visits at an average age of 20.1 months. These results align with guideline recommendations to screen at the 18-month check-up. However, there was a 28% decrease in the administration of a second M-CHAT (66.5%). Although not recommended as part of screening guidelines, some of these children received a third M-CHAT, which may have been driven by clinician/parent concerns about behavior/development, as 50% more children scored at high risk (>7) on a third M-CHAT compared to first and second M-CHATs. Next-step assessments will characterize referral practices associated with M-CHAT scores, caregiver completion of those referrals, and autism-diagnostic status to identify process gaps for subsequent intervention.



406.288 Bridging the Gap in Dentistry: Harnessing Behavioral Health to Improve Oral Health Outcomes for Autistic Youth

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Background: Autistic children have unique dental healthcare needs. Oral complications stemming from poor tongue and motor coordination, high sensitivity to toothpaste and flossing, and sensory reactions to fluoride, amalgam, and other dental products are common. Autistic youth are also prone to dental-related emotional (e.g., dental fear and anxiety) and behavioral (e.g., noncompliance, disruptive behavior, avoidance) symptoms. There is also a substantial gap in pediatric and autism-focused training for dental providers, and caregivers report significant challenges in finding dental practitioners who treat autistic children. Taken together, autistic youth and their families face barriers to accessing timely, equitable oral healthcare. Unfortunately, delayed oral healthcare may increase the likelihood of distressing and invasive dental procedures for autistic children. Child behavioral symptoms combined with limited pediatric training among providers may result in a pattern of negative dental interactions, which impacts child and family engagement in oral healthcare more broadly.

Objectives: This project will utilize extant literature to conceptualize child, family, and provider factors implicated in oral healthcare disparities among autistic youth and their families. We will present a novel intervention project funded by the National Institute of Dental and Craniofacial Research/National Institutes of Health, which aims to enhance dental providers' non-invasive behavioral strategies by teaching positive skills that target child compliance and comfort during visits.

Methods: A systematic review of peer-reviewed research was conducted to conceptualize factors implicated in the oral healthcare experiences of autistic children. In response to the gap in training for dental providers, a team of psychologists and dental providers collaborated to develop Dental-Child Interaction Training (DCIT), a research-informed training program drawing on principles from Parent-Child Interaction Therapy. Dental providers (N = 10) in a southern state participated in a pilot training focused on child behavioral health principles. Workshop outcome measures included skills assessments, provider satisfaction with the training, qualitative feedback, and the Usage Rating Profile-Intervention. **Results:** Findings from the literature review underscored a complex interaction of child, family, and provider factors implicated in oral healthcare treatment disparities among autistic youth. The findings also supported the utility of behavioral interventions among general pediatric healthcare providers and the extension of applied trainings to dental practitioners. Initial results from the DCIT training workshop reflected improvements in skills knowledge and utilization among participating dental providers from the pre-training ($M = 62$) to post-training ($M = 88$) knowledge assessment. Providers also reported high rates of satisfaction with the training.

Conclusions: There is a critical need for specialized training among dental providers to address the unique needs of autistic children. The pilot DCIT workshop demonstrated that a one-day training can improve provider skills. Results also showed acceptability and feasibility among providers, suggesting that wider implementation could enhance the quality of dental care for autistic youth. In the coming years, DCIT will be expanding trainings to reduce oral health disparities and improve dental experiences for youth and families. Future efforts will adapt DCIT to specifically address dental provider skills in working with autistic youth to reduce distress, increase comfort, and promote long-term positive dental practices.

406.289 Bringing Research to the People: Initial Feasibility, Acceptability, and Reliability of Cognitive, Molecular, and Neurophysiological Testing Completed in the Home of Individuals with Fragile X Syndrome

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Background: Fragile X syndrome (FXS) is the leading single-gene cause of intellectual disability and autism spectrum disorders. Many studies are underway to understand phenotypic variability and treatment response in FXS, but these studies are generally limited to individuals who can complete comprehensive in-person research batteries at major data collection sites such as hospitals. Numerous factors, including those associated with disadvantaged backgrounds (e.g. low socioeconomic status, rurality) and those directly related to the FXS phenotype (e.g., agoraphobia, irritability) prevent individuals from participating in traditional research visits, which limits the generalizability of findings.

Objectives: We aimed to assess the feasibility, acceptability, and reliability of *in-home completion* of a battery of measures typically collected in the laboratory.

Methods: Thus far, we have completed 14 home visits within a 100-mile range of our laboratory. Participants with FXS (13 males, 1 female; 14-65 years) completed IQ testing, NIH Cognitive Toolbox, 128-channel resting state electrophysiology (EEG), and venipuncture blood draw to quantify fragile X messenger ribonucleoprotein (FMRP). Participants were asked to complete a follow-up survey to establish acceptability of data collection. To test reliability of data collection, we compared home visit data to data collected in the laboratory within the past 2 years.

Results: We found high feasibility and acceptability of home visits, with all participant families providing positive feedback via follow-up survey. Test-retest reliability was high for IQ testing (nonverbal $r = .93$, verbal $r = .87$, Deviation IQ $r = .79$), FMRP assay ($r = .94$), and for absolute EEG band power (all $rs > .9$). Test-retest was moderate for selected NIH Toolbox measures ($rs .46-.70$).

Conclusions: With high feasibility, acceptability, and data reliability, our evidence suggests that home research visits provide a promising alternative to traditional laboratory visits. Following our successful pilot, we are now in the process of determining the extent to which home research visits can be (1) included as part of clinical trials, to reduce participant burden; (2) used to increase phenotypic, racial, ethnic, and socioeconomic diversity within research samples; (3) simplified by the using a travel-friendly EEG amplifier.

406.290 Building Clinical Skills in Neuroaffirming Care through Simulation

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Background: The manner a professional shares an autism diagnosis with a family can have an important and long-lasting impact on the family's overall experience of the diagnostic process and perception of autism. Neuroaffirming care focuses on understanding and supporting an individual's strengths and challenges and promoting their well-being and inclusion in society. What neuroaffirming care looks like will vary for every individual and family over time and relies on the clinician being able to integrate and adapt their expertise to different individuals' experiences, worldviews, and perspectives. Simulation-based learning models as a teaching tool has the potential to promote adaptive expertise in neuroaffirming care in experienced clinicians through immersive scenarios where clinicians can learn new skills, make mistakes, and reflect.

Objectives:

- Explore simulation using standardized patients to promote applying adaptive expertise to develop skills in neurodiversity affirming care within the specific context of sharing an autism diagnosis.
- Explore how a simulation-based learning model can promote the use of neurodiversity affirming language and behaviours in experienced clinicians.

Methods: We will use an exploratory case study design to assess participants' observed and perceived learnings from the simulation. Participants will be recruited from the BC Autism Assessment Network and include community pediatricians, psychiatrists, psychologists, nurse practitioners, and speech and language pathologists. Participating clinicians will go through three different case scenarios and share an autism diagnosis with standardized patient caregivers of a child or youth over a videoconference platform. These cases scenarios and learning objectives were created based on priorities in neuroaffirming care identified from literature and our community partners (an autistic youth, a neurodivergent adult, parents of autistic children who have had different experiences with the autism diagnostic process, and a community pediatrician). De-identified field notes, simulation session transcripts, and transcripts from participant's pre- and post-simulation interviews will be analyzed using a reflexive thematic analysis to explore the participants' observed and perceived learning from the simulation.

Results: The simulation is expected to run November 2024 and results will be analyzed by spring 2025. Discussions with community partners on their experiences with receiving an autism diagnosis resulted in preliminary themes pertaining to clinician communication and interpersonal skills including: Highlighting both the child's strengths and areas of challenges, and avoiding pathologizing language, the importance of tone and being empathetic in listening and responding to parents' concerns, exploring parents' understanding and acceptance of the autism diagnosis, and counselling parents on next steps.

Conclusions: It is critical that experienced clinicians also have opportunities to continue building their skills and confidence so that they can provide neuroaffirming care that is supportive of autistic individuals and their family at a critical time on a family's journey. The results of this project can have important impacts both on how we collaborate with families and on continuing professional education. Additionally, with community partners as co-investigators, we ensure that the goals of the neurodivergent community are at the forefront. Sharing decision-making power in research with community members helps foster mutual trust, transparency, and translation of findings into existing services.

406.291 Caregiver-Perceived Barriers to Care: Experiences of Emotion Dysregulation and Service Needs in Autistic Children

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Background: Emotion dysregulation, difficulty monitoring and modifying emotional reactivity and sustained negative emotion, is highly prevalent among autistic people. Autistic youth are 4-7 times more likely to experience clinically elevated emotion dysregulation compared to the general population. Further, it is associated with higher rates of crisis services, psychiatric hospitalization, and aggression. However, few studies have explored caregiver perceptions of the challenges and barriers getting support for their child's emotion dysregulation.

Objectives: The objective of this study was to identify the needs and barriers of receiving services for emotion dysregulation in autistic youth and young adults, from the perspective of caregivers.

Methods: Sixteen caregivers of autistic youth and young adults (aged 7-31 yrs) completed a 60-minute semi-structured interview. Participants were predominantly female (75%) and white (75%). Relationships to the autistic child included biological parents (81%), foster parents (13%), and family member acting as the primary caregiver (6%). Six participants (37.5%) had children with high support needs due to co-occurring intellectual disability, limited to no speaking ability, and/or several behavioral concerns or aggression. Participants were asked to share recent stories of their child's emotion dysregulation and experiences seeking care for their needs. Interviews were transcribed and a grounded theory analytic approach was used for coding and thematic analyses. Four coders, including one autistic adult, generated the initial codebook using a consensus approach. For this analysis, coders focused on discussions of service experiences and needs related to emotion dysregulation, and the analysis was grouped into themes and subthemes. Autistic adults were involved in all aspects of this project.

Results: When asked to describe their child's emotion dysregulation, caregivers indicated that sensory sensitivities and unexpected changes (44%) were most common contributors to dysregulation in healthcare and home environments. Exclusionary discipline from school personnel (e.g. involvement of school police, suspension, dismissal) and bullying from peers were the most reported causes to dysregulation in schools, with half of the sample noting this led to verbal and/or physical aggression. When asked about emotion dysregulation services, caregivers overwhelmingly described a glaring unmet need; "my child has nothing" was a quote that epitomized this theme. Caregivers expressed that services across all settings were a poor fit for their child's needs. Further, caregivers of children with high support needs uniformly shared that their child was excluded from mental health and community-based services. Caregivers (56%) expressed fear for their child's future, specifically limited access to care and safety of their child and others during dysregulation.

Conclusions: Autistic people are often excluded from services and when provided access, caregivers note them to be an inadequate fit. Caregivers, as a result, experience significant stress from their child's dysregulation that persists over time. Creating environments (i.e., classrooms, healthcare) that are inclusive and sensory affirming may help reduce the frequency of dysregulation which may, in turn, alleviate caregiver-related concerns for both them and their child's well-being. Future work should consider partnering with autistic people, parents, and providers to co-design services that are effective for emotion dysregulation with attention to common causes of dysregulation in various settings.



406.292 Caregivers' Experience with Family-Centered Service Delivery across Services in Their Community for Individuals with Autism and Other Developmental Disabilities

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Background: Family-centered care is a service approach that emphasizes the integral role families play in their child's service provision. This approach has been shown to promote positive service outcomes, improve overall satisfaction, and enhance quality of life. The Measure of Processes of Care (MPOC-20) is a validated and widely used measure that examines caregivers' perceptions of service delivery by assessing five core aspects of family-centered care. Furthermore, prior research has indicated that families of individuals with autism and developmental disabilities highly value and would benefit from family-centered care, though it may not be consistently implemented across service settings. Despite the global use of the MPOC-20 and the importance of family-centered care, to our knowledge, no studies have evaluated family-centered care in day habilitation (DH) services, a Medicaid-funded Home and Community-Based Service (HCBS) that serves over 519,000 individuals in the U.S.

Objectives: Our study aimed to examine how "Providing Specific Information about the Child" (Factor 3) and "Respectful and Supportive Care" (Factor 5) differ across DH and four other commonly used service categories (In-School Therapeutic - IT, Community-Based Therapeutic - CT, Professional Healthcare - PH, Community Supports - CS). We also compared how all five aspects of family-centered care varied within DH services, including "Enabling and Partnership" (Factor 1), "Providing General Information" (Factor 2), and "Coordinated and Comprehensive Care" (Factor 4) in addition to Factors 3 and 5.

Methods: Forty-three caregivers (90.7% female) of individuals diagnosed with autism (58.1%) and/or intellectual disability (55.9%) aged 6-28 years ($M = 16.0$, $SD = 5.8$; 65.1% male) who accessed DH participated in the study. Caregivers completed the full MPOC-20 for DH services and an abbreviated MPOC-20 (Factors 3 and 5 only) for IT, CT, PH, and CS services. We used separate one-way ANOVAs to test whether Factor 3 and Factor 5 scores differ across service categories and conducted post-hoc Tukey tests to probe significant effects. We also used paired t -tests to compare all pairs of factor scores within the DH service category.

Results: Factor 3 score did not vary across service categories ($F = 0.78$, $p = .544$), while Factor 5 score was significantly different across service categories ($F = 5.38$, $p < .001$). Post-hoc comparisons revealed that this omnibus effect for Factor 5 was driven by DH ($p < .001$) and PH ($p = .007$) each having higher scores than IT. Within DH, scores were significantly different for all pairs of factor scores ($ps < .003$), except for the pairs of Factors 1 and 4 ($p = .170$) and Factors 2 and 3 ($p = .351$).

Conclusions: Our findings suggest that while services may not differ in information provision, they vary in providing respectful and supportive care. Specifically, DH and PH services excel in providing respectful and supportive care when compared to IT services. Additionally, DH services may also be especially effective in facilitating caregiver-provider partnership opportunities, while being less skilled in providing general or diagnostic-related information. This study underscores the need for further research to examine inter-service differences in providing family-centered care.

406.293 Characterizing Referral Patterns to a Multidisciplinary Autism Clinic

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Background: Recent increases in prevalence estimates of autism spectrum disorder (ASD) are thought to be due to increased awareness of ASD clinical presentations. Updated prevalence estimates (Maenner et al., 2023) suggest some racial disparities in identification have waned (e.g., more timely identification of Hispanic and Asian/Pacific Islander children and females) while others persist (e.g., Black children are significantly more likely to be identified if they have co-occurring intellectual disability (ID) or global developmental delay (GDD)). However, increased awareness contributes to a significant increase in demand for diagnostic series, stretching waitlists nationally and necessitating critical examination of clinical practices.

Objectives: Examine patterns of patients referred to a major metropolitan multidisciplinary Autism Diagnostic Clinic.

Methods: This sample included 8,867 patients aged 0 to 18 years who were referred to an interdisciplinary, outpatient autism diagnostic clinic between January 2018 and December 2023. Patient demographic information and diagnostic impressions were extracted from the electronic medical record using an automated process. Chi-square tests assessed group differences across demographic variables. Multinomial logistic regression was used to model age at referral, categorized as 0-4, 5-11, and 12+ years. Predictors included individual, healthcare, and language demographics.

Results: Across all age groups (0-4, 5-11, and 12+), age at referral showed significant differences across various demographic characteristics based on bivariate analyses. Individuals assigned male at birth were referred at younger ages than females ($p < 0.01$). A higher proportion of females presented for evaluation in the 12-18 age (38.7% female) range compared to the younger cohorts (% female: 0-4 years – 25.9%; 5-11 years – 25.3%; $p < 0.01$). Across patients requiring an interpreter, those identifying as white, non-Hispanic were referred later than any other racial or ethnic group.

Multinomial logistic regression analyses (Table 2) revealed significant predictors of age at referral. Children with GDD/ID had lower odds of being referred in older age groups, with those aged 5-11 years having 66% lower odds compared to the 0-4 group, and those aged 12+ having 71% lower odds. Public insurance was associated with 31% lower odds of referral at age 12+ compared to private insurance. Hispanic children had lower odds relative to White Non-Hispanic children of being referred in the older age groups, with odds reduced by 36% for the 5-11 age group and 50% for the 12+ group. Male children had 60% lower odds of being referred at age 12+ compared to females.

Conclusions: These findings suggest children with GDD/ID and males in general continue to be referred earlier. Hispanic youth are referred less often than white peers once they reach 5 years and older, and children with public health insurance and males are less commonly referred after 11 years old. Patients requiring interpreter services for certain primary languages may be referred later than others.



406.294 Characterizing Team- and Implementation-Related Factors in a Leader-Focused Implementation Strategy for Autism Interventions in Children's School and Mental Health Services

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Background: The TEAMS trials consisted of two linked randomized Hybrid Type 3 implementation trials that tested implementation strategies paired with autism evidence-based interventions (EBI) in children's mental health agencies and schools (Brookman-Frazee & Stahmer, 2019). The TEAMS Leadership Institute (TLI) is a leader-focused implementation strategy targeting implementation leadership and climate to facilitate autism EBI implementation. TLI included a 360-assessment of implementation leadership and climate, a pre-implementation workshop with leaders, and data-informed development of an implementation climate and leadership plan. Leaders from each program/district engaged in regular coaching calls to plan implementation and monitor implementation. Programs/districts randomized to receive TLI demonstrated significantly better provider fidelity and child outcomes compared to programs/districts that did not receive TLI.

Objectives: The current study uses mixed qualitative and quantitative analyses to (1) characterize which strategies leaders identified to create a climate for EBI implementation and (2) examine leadership team composition, processes, and functioning over 6 months of training and implementation.

Methods: Data were drawn from implementation leadership teams from 36 programs/districts randomized to the TLI condition. Qualitative Content Analysis (Elo & Kyngäs, 2008; Gale et al., 2013) was used to identify the forms (goals and actions) and functions (implementation climate or leadership subdomains) of the implementation plans. Twenty audio-recorded coaching calls will be transcribed and thematically coded using deductive qualitative analysis (Bingham et al., 2023) to further identify implementation support goals and strategies utilized by leaders. Team-related factors are being characterized according to established models of team effectiveness (e.g., Mathieu et al 2020).

Results: Across the 36 programs participating, there were 53 implementation plans. Teams were comprised of an average of 2.3 leaders, and they participated in an average of 8.8 coaching calls (range 3-15) over 6 months. Most plans (98%, $n=52$) included at least one goal focused on functions within the implementation climate domain. The most common climate functions were "Recognition" ($n=52$), "Rewards" ($n=36$), and "Focus" ($n=33$). Common forms included 1) staff-informed and tangible rewards, 2) public recognition of staff efforts, and 3) public endorsement of EBI. Plans also included leadership goals (58%, $n=31$). The most common leadership functions were "Proactive" ($n=28$) and "Knowledgeable" ($n=21$).

Common forms included 1) proactively problem solving and 2) gaining hands-on experience in EBI. Team composition varied by program/district. Further data examining team-related factors and the themes that arose from the TLI coaching call themes will be discussed.

Conclusions: Leaders developed implementation plans prioritizing rewards, recognition, and focus while emphasizing proactive and knowledgeable leadership. These findings highlight key strategies for enhancing the implementation of autism interventions across school and mental health settings and within leader teams supporting implementation, suggesting areas for future research and practice.

406.295 Clinical Profile of School-Aged Students with Autism Spectrum Condition in the Chilean Public Education System: A Case-Control Study

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Background: Specialized evaluations of children and adolescents suspected of having Autism (ASC) are typically carried out by public or private health programs and are often focused on the preschool stage.

Objectives: In order to develop comprehensive specialized support programs for individuals with a diagnosis or suspected diagnosis of autism at school age, it is essential to delve deeper into their clinical description.

Methods: This study presents a descriptive analysis of the clinical profile of students referred for specialized neurodevelopmental evaluations from 15 regular schools (8,040 students) in a representative district of Greater Santiago, Chile. The clinical profile of those with a diagnosis of autism (AG) versus those without a diagnosis of autism (CG) was compared.

Results: AG is composed of 53 students (17% female; M: 11.57, SD: 3.15; R: 6 to 18 yo) while 134 students compose the CG group (26.87% female; M: 12.06, SD: 3.46; R: 5 to 20 yo). AG showed a higher comorbidity burden (no comorbidity: 15.6%; 1 comorbidity: 33.3%; 2 or 3 developmental comorbidities: 51.0%) compared to CG (no comorbidity: 37.7%; 1 comorbidity: 35.2%; 2 or 3 developmental comorbidities: 27.0%), $\chi^2(2)=14.45$, $p=0.0007$. The most frequent comorbid diagnosis in the AG was ADHD (66%), followed by borderline intellectual functioning (BIF) (28%), mild Intellectual Disability (Mild ID) (20%), Developmental Language Disorder (DLD) (9%), and Mod ID (7%). The CG was mainly characterized by ADHD (91%), followed by Mild ID (20%), BIF (17%), Specific Learning Disability (SLD) (17%), and DLD (5%). There was no association between autism diagnosis and the presence of mental health diagnoses (i.e., anxiety disorders or mood disorders) (AG: 9%; CG: 11%), $\chi^2(1)=0.2222$, $p=0.64$. An association was found between school delay and ASC, $\chi^2(2)=7.307$, $p=0.0259$, as well as between transfers from regular to special schools and autism diagnosis, $\chi^2(3)=10.97$, $p=0.0119$. However, this association was not due to a link between autism and global cognitive impairment (i.e., Mild ID, Mod ID or BIF), $\chi^2(1)=0.05046$, $p=0.8223$.

Conclusions: The comparison between these neurodivergent groups highlights that school-aged students with an ASC show a greater need for support compared to other neurodivergent groups within the public education system in Chile, and likely in other Latin American and international contexts. Although, no differences in mental health burden between the groups were observed, there appears to be underreporting of challenges in this area, possibly due to normalization of the emotional distress and behavioral expressions in this population. On the other hand, the reason why the female gender is underrepresented in referrals for evaluation will be studied and poses challenges for gender-related equal opportunities. While larger prospective studies are needed, this study provides insight that justifies allocating and organizing resources for specialized evaluation and support for students with autism diagnoses in the school setting.

406.297 Consumer Perspectives on Applied Behavior Analysis Service Delivery

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Background: Applied Behavior Analysis (ABA) is the application of behavioral principles to affect meaningful behavior change and is widely recommended for autism intervention. However, concerns have been raised by autistic self-advocates about potential coercion, lack of assent from autistic children, and possible long-term mental health effects (e.g., PTSD; Kupferstein, 2018). A mainstay of ABA research and practice is social validity, or formal evaluation by stakeholders (i.e., consumers, clients) of intervention goals, procedures, and outcomes (Wolf, 1978). While autistic children and adolescents are the most common direct recipients of ABA services, their representation in social validity data is limited (Huntington et al., 2023). The field has yet to consider criticism from autistic self-advocates as an important source of social validity data that can guide improvement of the implementation of ABA.

Objectives: To explore the perspectives and experiences of autistic adults, behavior analytic professionals, and parents and caregivers of individuals with autism in relation to ABA service delivery.

Methods: This participatory research is being completed by a team consisting of behavior analysts, autistic adults, and parents of individuals with autism. Data presented in this poster include findings from three parallel surveys completed by autistic adults, behavior analysts, and parents and caregivers of individuals with autism. Surveys data collection will be completed in November of 2024, and preliminary findings are included in this submission. Data analysis will consider descriptive and correlational outcomes of survey data to identify consumer perspectives on service delivery as well as predictors of positive or negative perspectives or experiences (e.g., are positive experiences more likely when an individual has high support needs autism?).

Results: The current preliminary dataset includes autistic adults ($N = 13$), Caregivers ($N = 35$) and Behavior Analysts ($N = 57$). Data varied across participants regarding their opinions about ABA. Among autistic individuals, opinions were more divided; however, the majority of autistic adults endorsed the 'yes' and 'sometimes' options for ABA's positive effects. Caregivers also had mixed opinions, though most expressed positive sentiments about the effectiveness of ABA. Behavior analysts generally had strong positive views about the impact of ABA services. Overall, participants expressed positive opinions about the work ethics of behavior analysts, as reflected in the endorsement of 'yes' and 'sometimes' responses. However, some autistic adults and caregivers selected 'no' to all statements, indicating that not all participants believe behavior analysts consistently work to support autistic individuals and their families ethically.

Conclusions: While perspectives on ABA vary across consumer groups, negative perspectives are more common among autistic adults. As autistic people are the primary consumers of ABA, their feedback should be incorporated to improve services. Additionally, as parents and caregivers' perspectives may represent the extent to which ABA was meaningful for individuals in their care who have high support needs, it is important that their experiences be included in critical feedback of ABA service delivery to improve outcomes and social validity of practices.



406.298 Leveraging a Modern Technology Platform to Build a Pathway to Equitable Care for Autism

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Background: It is now possible to diagnose autism as soon as the behavioral characteristics of autism emerge, usually in the second year of life, and to provide children with individualized teaching so they can develop the skills they need to communicate and have a high quality of life. However, families and children often face significant barriers to timely diagnosis, effective intervention and accessing the support they need. A critical step to ensuring equitable access to care is to identify the geographic distribution of autism resources. Mapping resources is a critical step toward directing service expansion efforts where they are needed most.

Objectives: The goal of this study was to provide a proof-of-principle approach to determining autism resource distribution across Washington state using a caregiver-facing resource navigation database.

Methods: This project utilizes data from a centralized, online database, AS360.org, with searchable clinical resources, educational materials, community forums, and age-based checklists. It codes the location, type, and other characteristics of clinical resources that can be input directly by community service providers. The number of resources increases as providers add information. AS360 is architected on Web2 HTML 5 and React-based technology enabling cross platform (desktop, tablet, mobile) user-experience, enterprise-grade security, and protected user access. It implements dynamic CMS database technology tied to CRM technology to manage users, community, access and content. Heat mapping and geographic analysis for proximity of people and resources was applied to understand resource scarcity and abundance alongside demand. The current results (Figures 1 & 2) are based on 500+ locations across Washington state.

Results: The heat map (Figure 1) illustrates the density of clinical resources across Washington state. This platform is elastic enabling for the data to drive the boundaries geographically and attribute wise. This means as locations from other countries, states, or cities arrive in the engine, the analytics automatically widen to cover new regions at rapid scale. The point map (Figure 2) illustrates a second way that users can visualize resources geographically.

Conclusions: This project demonstrates the utility of employing an autism resource database built with current technology to identify the geographical distribution of clinical resources. At this time, AS360.org can be used by groups in any city, state, or country to develop a resource database for their community. This information can support caregivers, providers, and policy makers with real-time information that is needed to provide autistic children with the best possible support and quality of life. Future research by policy makers and business owners can use AS360.org to determine areas of clinical resource scarcity through Gap Analysis, a method typically applied to commercial real estate that can be used to understand where clinical resources are lacking and where there may be future demand. Through Gap Analysis, AS360 has the potential to identify underserved populations so resources can be deployed for social benefit.

Figure 1. (Heatmap using AS360 Database)



406.299 Cultural Adaptation Practices in Autism Services: A Mixed Methods Study

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Background:

The Applied Behavior Analysis (ABA) therapy system faces multiple ethical challenges that directly impact marginalized communities. Most ABA-based interventions were not developed for and with diverse populations in mind (Bak et al., 2023; Steinbrenner et al., 2021; West et al., 2019), cultural adaptation methods and models are required to uphold the values of cultural humility and responsiveness. Culturally adapted interventions for Latine families of autistic children improve parents' participation and engagement in interventions (Buzhardt et al., 2016; Chlebowski et al., 2018; Magaña et al., 2017). Research highlights the need for cultural adaptations in ABA-based services, including both surface and deep structure adaptations (Sivaraman & Fahmie, 2020). Previous survey studies seeking to understand the perspectives of ABA practitioners on culturally responsive practice have found that practitioners agree on the need for and importance of cultural responsiveness trainings. However, although they report having limited training in this area, they feel highly skilled at working with individuals from diverse backgrounds (Beaulieu et al., 2022).

Objectives:

The current mixed methods study sought to understand the knowledge, use, barriers, and facilitators to cultural adaptation practices of ABA across social and cultural structures (ABA field, agencies, communities, and individuals); considering the eight EVF dimensions of cultural adaptation and the cultural competence continuum (Cross, 1989).

Methods:

An explanatory sequential mixed methods approach (QUANT – QUAL) was used to answer research questions, where quantitative data were collected via survey methods, followed by qualitative data to deepen our understanding of cultural adaptation knowledge and practice across four different groups (i.e., clinical directors, BCBAs, and RBTs.). The qualitative data involved a subset of survey respondents using semi structured interviews. Mixed methods were required in this case, as we were interested in understanding barriers and facilitators to cultural adaptation in practice that required qualitative data methods.

Results:

We received 667 unique responses to the survey, 200 were from BCBAs, 219 were from BCaBAs, 49 were BCBA-D's, and 199 Registered Behavior Technicians. Twenty seven percent of respondents were working directly with clients (behavior technicians), while 35% were in a supervisory role, and 38% were clinical directors. The majority of respondents identified as male (58% n=386), female (40%, n=267) and 2% (n=14) as non-binary. Overall, in regards to cultural adaptation practices related to language, content, methods, process, people and contexts, and goals respondents reported that they were somewhat knowledgeable (M=2.06; SD=.89) and that they somewhat frequently used these interventions in their practice (M=2.1; SD=.95). Thematic analysis revealed the organizational and individual level barriers and facilitators to cultural adaptation in practice. Barriers included attitudinal, resource, policy, and cultural mismatch of ABA-based strategies. Similarly, facilitators included attitudes and values at the organizational and individual level, resources and knowledge, and policies.

Conclusions:

Individual and organizational level factors must be considered to improve culture-match of ABA based interventions within the existing service system.

406.300 Cultural Adaptation and Application of Acceptance and Commitment Therapy for Parents of Children with Autism

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Background: **Acceptance and Commitment Therapy (ACT)** is a mindfulness-based behavioral intervention widely used to enhance psychological flexibility and improve mental health.

Objectives: This study aims to investigate the effectiveness of ACT for parents of children with autism.

Methods: Using the translated version of the ACT intervention manual and guided by the Ecological Validity Model (EVM), Study 1 involved focus groups and personal interviews to gather data, which was analyzed through thematic analysis. Based on the findings, cultural adaptations were made to the intervention manual, with revisions in four key dimensions: language, metaphor, content, and methodology. Study 2 tested the effectiveness of the revised intervention program through a randomized controlled trial involving 43 mothers of children with autism—21 in the intervention group ($M_{age}=43.05$, $SD_{age}=8.692$) and 22 in the control group ($M_{age}=39.09$, $SD_{age}=5.335$). The intervention group received the revised program over 7 weeks, with one 90-minute session per week, while the control group remained on a waiting list for the intervention. Pre- and post-intervention measurements were taken using the Acceptance and Commitment Comprehensive Assessment Questionnaire, the Depression-Anxiety-Stress Scale, and the Positive and Negative Affect Schedule. Participants also completed an evaluation questionnaire at the end of the group sessions.

Results: The results showed significant differences between the intervention and control groups in terms of psychological flexibility, depression, and positive affect. Mothers in the intervention group experienced a significant increase in psychological flexibility ($p = 0.017$), a notable decrease in depression levels ($p = 0.010$), and a significant rise in positive affect after the intervention ($p = 0.019$). Additionally, participants who completed the intervention reported high levels of satisfaction with the group sessions ($M = 4.52$).

Conclusions: In conclusion, the revised ACT intervention program was effective in enhancing psychological flexibility and improving the psychological well-being of parents of children with autism. However, further improvements to the program are necessary to better meet the needs of parents and achieve even better outcomes.

406.301 Deficit-Focused Clinical Reports Are Associated with Negative Impressions of Prospective Autistic Clients By Speech Pathologists Compared to Neurodiversity-Affirming Reports

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Background: Non-autistic clinicians have direct power over autistic individuals and contribute to creating and institutionalizing ideas about autism (Friedman, 2023). Research has suggested two factors compete: systemic language describing autism perpetuates institutionalized ideas while direct experience tempers stereotypes. For example, Obeid and colleagues (2021) demonstrated White college students are more likely to identify a Black child than a White child as having Conduct Disorder, a label associated in their data with even higher stigma than ASD, but Black students trended in the opposite direction. Thus, experience counterbalances stereotypes about autism and other identity markers such as race or gender, contributing to clinical impressions of prospective clients.

Objectives: In this study, we compare the effects of reading neurodiversity-affirming (NDA) writing and more clinical experience on producing more compassionate expectations of new clients to the effects of reading deficit-focused (DEF) writing and having less clinical experience on forming negative expectations. Outcome measures included self-reported social acceptance of specific autistic individuals described, the accuracy of diagnostic impressions, and the stigma associated with incorrect impressions. Perceptions of autistic males and females are also considered as an important identity marker that shapes a priori clinical perceptions of autistic persons.

Methods: One hundred and twenty SLPs (50 trained clinicians and 70 student clinicians) were randomly assigned one of two versions of paired vignettes about real autistic clients (2 girls and 2 boys). Vignettes were written by the clients' actual clinicians in either style. Participants selected a category that best fit their impressions from options including: Autism (ASD), 4 higher stigma labels such as conduct disorder, and 3 lower stigma labels such as Anxiety. Participants also responded to a social distance scale (SDS) asking them about their willingness to accept the individual described into their social lives (adapted from Gillespie-Lynch et. al., 2022 via Bogardus, 1933). All clients had a diagnosis of autism and none of the other diagnostic labels listed.

Results: Most clinicians (77-78%) correctly identified ASD regardless of writing style. Of incorrect assignments, DEF writing resulted in significantly more high-stigma miscategorizations ($X^2=31.56$, $p<.001$), for boys over girls ($X^2=27.12$, $p<.001$). DEF writing led to significantly less social acceptance of only males ($t(104)=4.217$, $p<.001$). Boys also received more high-stigma miscategorizations regardless of writing style ($X^2=37.34$, $p<.001$).

More experienced clinicians correctly classified significantly more descriptions (84%) than students (72%) ($X^2=8.84$, $p=.003$). Of incorrect assignments, less experience was associated with more high-stigma categorizations ($X^2=13.42$, $p<.001$), but experience did not improve social acceptance.

Conclusions: The language used to describe a client in a clinical report influences how clinicians perceive an autistic child before treatment starts. This study explored the impacts of NDA and DEF writing styles on the likelihood of misdiagnoses, higher stigma misdiagnoses, and social acceptance of autistic individuals from clinical descriptions alone. This study also highlighted the possible contributions that DEF language interacts with existing stereotypes about gender to result in more negative interpretations of autistic behaviors in male clients.

406.303 Differences in Part-C Early Intervention Provider-Reported Evidence-Based Practice Use and Self-Efficacy across Four States

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Background:

The Part C Early Intervention (EI) system provides publicly-funded community infrastructure for autistic (ASD) toddlers to receive specialized interventions in the United States (Stahmer & Aarons, 2009). Part C employs diverse providers with a wide array of training and professional experiences, which vary significantly between states (Pickard et al, 2024). However, little is known about how these differences impact the delivery of ASD-specific evidence-based practices (Autism EBPs), such as parent coaching and NDBIs.

Objectives:

Characterize differences between Part C EI provider professional characteristics (disciplinary background, degree, years of experience, employment status, perceived support of CEUs) across four states and examine how these characteristics relate to providers' Autism EBP use and self-efficacy in providing care to autistic children.

Methods:

Part C EI providers participating in ongoing RCT examining the effectiveness of a parent-mediated social communication intervention completed a survey about their professional background and frequency of use of common NDBI strategies (e.g., imitation, modeling, prompting), provider coaching strategies, and self-efficacy regarding knowledge, comfort, and confidence working with autistic children. Differences in providers' professional characteristics by state were examined via one-way ANOVA or Chi-square as appropriate. Multiple regression was used to examine whether provider characteristics were related to their self-reported use of NDBI and parent coaching strategies, and self-efficacy in providing care to autistic children.

Results:

Significant differences across states were observed for provider discipline ($\chi^2(15, N = 151) = 77.456, p < 0.001$), employment status ($\chi^2(3, N = 97) = 59.303, p < 0.001$), years of experience in the field ($F(3,150) = 7.451, p < 0.001$), and years of employment with their current agency ($F(3,150) = 11.185, p < 0.001$). There were no significant differences in educational degree, ability to pursue CEUs, use of NDBI strategies ($F(3, 146) = 2.480, p = 0.063$) or use of parent coaching strategies across states ($F(3, 146) = 1.229, p = 0.302$). However, there was a significant difference in provider-reported ASD self-efficacy ($F(3, 146) = 3.710, p = 0.013, \eta^2 = .071$), with providers from MA reporting lower self-efficacy than IL. Multiple regression indicated that providers' ability to pursue CEUs was significantly associated with their self-reported use of coaching strategies ($\text{Beta}=.28, t=2.67, p=.009$). Having an "other" disciplinary background (e.g., physical therapy, music therapy) was associated with lower self-efficacy ($\text{Beta}=-.32, t=3.10, p=.003$) and more years of professional experience were associated with higher self-efficacy ($\text{Beta}=.35, t=2.95, p=.004$). No professional characteristics were associated with provider self-reported NDBI use.

Conclusions:

Findings suggest that there are a number of differences in professional characteristics of EI providers across states. As some of these characteristics are related to use of Autism EBPs and confidence to provide high-quality intervention, they should be measured and considered in training efforts within the EI system.



406.304 Does Early Intervention Service Acquisition Vary across Diagnostic Groups When Accounting for Sociodemographic Factors?

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Background: Early Intervention (EI) aims to support the developmental needs of children with disabilities and delays during early childhood; however, systemic barriers based on sociodemographic factors may affect accessibility of these services. Families from lower socioeconomic (SES) backgrounds experience more limited access to specialized care, fewer psychoeducational resources, and delays in accessing EI. Race- and sex-based inequities in autism diagnosis and presentation also affect when children are referred for services. Although legislation requires that EI be freely available, there is limited knowledge of how the interplay between SES, race, and sex affects utilization of EI services in autistic versus non-autistic children.

Objectives: Examine rates of EI utilization by 24 months of age among children with an older biological sibling who is either typically developing (typical likelihood of autism; TL) or diagnosed with autism (elevated likelihood of autism; EL), with a focus on the impact of sociodemographic factors.

Methods: Participants included 112 children enrolled in a longitudinal study based on EL ($n=50$) or TL ($n=62$) status. Participants received diagnostic classifications of typically developing (TD; $n=78$), autism (ASD; $n=18$), developmental delay (DD; $n=3$), or both autism and DD (ASD+DD; $n=13$) (age range of diagnosis=24-54 months; mean=27.47). Parents completed questionnaires regarding sociodemographic factors and EI enrollment at 12 and 24 months. Analyses examined how rates of EI utilization by 24 months of age varied as a function of autism likelihood (EL/TL), diagnostic outcome, SES, race, and sex. Given the large number of predictor variables, chi-square analyses were conducted first to determine which variables were significantly associated with EI utilization; these were then included in a generalized linear model (GLM). Tukey's HSD post-hoc tests were conducted for pairwise comparisons.

Results: Chi-square tests indicated that SES ($\chi^2=13.32$, $p=0.04$), diagnostic outcome ($\chi^2=26.03$, $p<0.001$), and autism likelihood ($\chi^2=4.82$, $p=0.03$) were significantly associated with EI utilization. The GLM including these variables as predictors indicated that only diagnostic outcome was significant when accounting for the others ($F=9.83$, $p=0.002$, $\eta^2=0.09$). Post-hoc tests revealed significant differences between TD vs. ASD ($\bar{d}=-.46$, $SE=.106$, $p<.001$) and TD vs. ASD+DD ($\bar{d}=.54$, $SE=.122$; $p<.001$), with TD using EI less than ASD and ASD+DD.

Conclusions: Although SES was associated with EI utilization overall, this relationship was no longer significant when accounting for diagnostic outcome. Small sample sizes and negative skew in SES (skewness=-.886, $SE=.228$), with most participants in the upper-middle to upper-class range, likely influenced findings; future research will benefit from a larger, more socioeconomically diverse sample. Children with ASD or ASD+DD were more likely to access EI services prior to diagnosis, suggesting the presence of earlier developmental markers of autism, and that diagnostic outcomes, particularly related to autism, are stronger at predicting EI access than sociodemographic factors in this sample. Future work should explore (1) whether EI enrollment prior to age 2 is a helpful predictor of future autism diagnosis, particularly in a sample that includes more non-autism developmental delays, and (2) associations between diagnostic outcomes and even earlier EI enrollment (e.g., by 12-months-old) and/or specific EI service types (e.g., speech, occupational therapy).



406.305 Early Autism Diagnosis in Primary Care: Empowering PCPs to Assess Autism in Toddlers

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Background: The shortage of autism specialists is a major barrier to timely diagnosis and intervention for young children. As early diagnosis is critical for effective intervention, enhancing the diagnostic capabilities of primary care providers (PCPs) is essential. By training PCPs to recognize and diagnose autism in toddlers with a high likelihood of autism, we can capitalize on the momentum of universal screening practices in primary care and strengthen care within the child's medical home. By equipping PCPs with the right tools, we can reduce the age at which children receive a diagnosis, facilitate earlier access to interventions, and alleviate the burden on specialists.

Objectives: To evaluate diagnostic outcomes following autism evaluations performed by PCPs.

Methods: 21 PCPs (termed "Autism Champions") in 11 primary care practices were trained in early autism diagnosis, including an autism developmental history, administration of the Screening Tool for Autism in Toddlers and Young Children (STAT), and completion of the Childhood Autism Rating Scale-2 (CARS-2). Referrals included children who score 8 or greater on the Modified Checklist for Autism in Toddlers (M-CHAT-R/F), and the patient experience was a 60-minute evaluation with a Champion followed by a 30-minute feedback session one week later. Children who scored positively on the STAT and CARS, and who met all DSM-5 criteria per clinical judgment were given a diagnosis and referred to community-based interventions. Children who did not meet all the program's criteria for diagnosis were referred to Developmental and Behavioral Pediatrics (DBP) for a specialist evaluation. Autism Champions met twice monthly with autism diagnostic specialists to discuss complex cases, documentation, billing, and community resources.

A follow-up study is underway to evaluate diagnostic status and connection to services 6+ months after evaluation. Interviews about the diagnostic process will be recorded, transcribed, and analyzed thematically.

Results: Since 2022, 535 patients have been referred to a Champion, and 394 have been evaluated. 75.4% ($n=297$) were diagnosed with ASD by a Champion, and 24.6% ($n=97$) were referred to DBP. The average age at evaluation was 30 months. Initial results from the follow-up study suggest 100% diagnostic agreement by record review and/or remote video assessment ($n=16$ to date, with follow-up data still being collected).

Conclusions: Training primary care providers to conduct autism evaluations in very specific populations, and with standardized tools like the STAT and CARS2 shows promise in improving early identification and decreasing the age at diagnosis. Integrating autism diagnostic evaluations into primary care can help address the shortage of specialists and facilitate quicker access to early intervention services. Initial outcomes indicate strong diagnostic agreement. Further research is needed to explore the long-term effects of PCP-led evaluations on service access and developmental outcomes.

406.306 Early Diagnostic Response Model (EDRM) Phase One: Increasing Access to Early Autism Assessment through a University Partnership with Early Intervention (EI)

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Background: Early diagnosis of autism spectrum disorder (ASD) is critical, as it leads to improved communication and daily living skills and ensures access to essential ASD-specific interventions. However, lengthy waitlists, a dearth of diagnostic clinicians, and the need to travel long distances often make it hard for parents to get timely evaluations. The Early Intervention (EI) system, established under Part C of the Individuals with Disabilities Education Act (IDEA), provides an opportunity to screen and refer children at-risk for ASD for further evaluation, especially outside of metropolitan areas. In 2018, EI providers across the state received training in ASD-specific screening which resulted in many children being identified as needing further evaluation, but they were not able to obtain an assessment. Telehealth technology presents a valuable alternative to traditional in-person assessments (IPA), particularly for families with limited access to diagnostic services.

Objectives: Evaluate a telehealth autism assessment pilot, Early Diagnostic Response Model (EDRMPhase1), that partners with EI providers across the state. Children enrolled in EI in specified health districts, mostly rural, that scored high-risk on the *M-CHAT-R/F* were referred to a university for an in-depth telehealth assessment. Evaluation of EDRMPhase1 included the number of assessments, time from referral to feedback/report, clinician confidence, and final diagnoses as well as acceptance of the assessment pilot by parents and EI providers.

Methods: Analyzed using SPSS EDRMPhase1 demographics, including number assessed, resulting diagnosis(es), days in the assessment process, and feedback from caregivers and EI providers.

Results: During EDRMPhase1, from 6/01/2022 to 10/21/2024, a total of 192 referrals were made to the pilot with 85.5% completing or currently enrolled. Of the completed evaluations (N=142), the average age at referral was 21.42 months (SD=4.45), majority were male (N=94, 66%), Black (N=75, 53%) and had Medicaid insurance (N=162, 89%). As a result of the assessments, 100% were diagnosed with ASD, and a majority were also diagnosed with Global Developmental Delay (N=107) and nonverbal (N=84) or used single words (N=53). Average time from referral to intake to assessment to feedback/report was only 38 days (SD=1.01). On a 5-point scale (5 is Strongly Agree), caregivers (N=62) reported feeling the assessment was comprehensive (M=4.76, SD=0.50), confident in the results (M=4.76; SD=0.67), and glad EI providers were involved (M=4.63, SD=0.64). EI providers (N=54) also reported feeling the assessment was comprehensive (M=4.89, SD=0.31), confident in the results (M=4.79, SD=0.51), and that being involved was helpful (M=4.63, SD=0.71).

Conclusions: The findings from EDRMPhase1 underscore the success of a telehealth pilot that partners with EI providers. EI providers play a critical role in helping identify at-risk children for ASD and supporting timely access to assessments and therefore intervention. By partnering with EI providers who are trained in ASD-specific screening, the model successfully used a telehealth protocol to provide ASD assessments to address barriers such as long wait times and geographical constraints, particularly for racially and geographically underserved populations. Not only were the telehealth assessments acceptable to both caregivers and EI providers, but with EI providers included, families had access to additional support post-diagnosis.

406.307 Echo Autism Community Connections Program

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Background:

For the past decade, ECHO Autism Communities has worked to professionally develop and provide specialized training to primary care physicians and psychologists to increase access to autism evaluation and diagnosis. An increase in access is what was desired. However, there is the growing recognition that community-based diagnosticians face challenges in providing the necessary support for patients and families. Navigating complex support systems can be difficult. This includes accessing services like the Regional Office, evidence-based therapies, special education, and resources for parents and siblings. In late 2022, ECHO Autism Communities created a solution to address this support gap, launching the ECHO Autism Community Connections program which has been found to be very successful for patients, families, and clinicians alike.

Objectives:

- Increase client self-efficacy in accessing recommended high-quality, best-practice information/resources, services, and supports.
- Reduce clinician burden in supporting newly diagnosed clients as they learn about and access common clinician recommendations.

Methods:

Participants who received professional development through the ECHO Autism: Advocates program were recruited as ECHO Autism Community Connections (EACC) Connectors to support patients/families diagnosed with autism by community-based diagnosticians. Connectors received additional training through resource documentation reviews, videos, and call shadowing.

Clinicians refer patients/families to EACC following diagnostic appointments to support them for up to 12-months as they connect to recommended resources. Patients/families are contacted by Connectors approximately 6 times during program participation. Progress summaries are documented and shared with the diagnostician and the patient/families after each connection. Program satisfaction data is collected from patients/families following program completion and from diagnosticians semi-annually.

Results:

Data collection will continue through February 2025. To date, 62 patients/families have finished the program. Completed satisfaction surveys thus far indicate that 100% of patients/families agree or strongly agree that the Connector's guidance was helpful and 100% understood the recommendations from their clinician and felt confident in the ability to access community supports and services. Prior to participation, 68.8% of patients/families reported feeling overwhelmed about the next steps compared to only 18.8% after program completion.

Diagnosticians also reported a high satisfaction with the program with 100% reporting that it helped to support patients/families in getting connected to recommended resources and 83.3% shared it helped them be better informed about patient needs.

Conclusions:

Preliminary data concludes that the EACC program is a feasible model that has been successful in developing a trained team of Connectors who are currently supporting patients/families throughout the state of Missouri. Patients/families who have completed the program report an increase in their ability to understand and access recommended services and resources after receiving a new diagnosis of autism. Diagnosticians report overall satisfaction with the support their clients receive after diagnosis in connecting with recommended resources. This collaborative approach enhances the quality of care and fosters a supportive community. As a result, patients/families can thrive, leading to better outcomes for autistic individuals.

406.308 Echo Ukraine: Supporting Ukrainian Children and Families Coping with the Challenges of War

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Background: The purpose of our project is to build the capacity of Ukraine's mental health and educational service providers to care for children with mental health conditions and developmental disabilities, in particular children with Autism Spectrum (ASD). In 2017, our group of USA professionals began collaborating with colleagues in 3 cities in Ukraine to present annual workshops. We established ECHO Ukraine in 2019 as a collaboration between USA and Ukrainian specialists (content experts) and switched to monthly virtual ECHO sessions through Zoom videoconferencing as part of the international ECHO project. The ECHO model (Extension for Community Healthcare Outcomes) is recognized as an evidence-based mentorship and training model to build capacity among community providers.

Objectives: Our objective is to expand the capacity of Ukrainian mental health, health and educational providers to care for children with mental health conditions and developmental disabilities including ASD with special focus on children who have experienced trauma related to Russia's war on Ukraine.

Methods: The administrative home of ECHO Ukraine is the Vasyl Stefanyk Precarpathian National University in Ivano-Frankivsk (IF). The participants in the project include pediatricians, child psychiatrists, psychologists, social workers, speech pathologists, teachers and university students, most from western Ukraine where IF is located. Our expert panel includes USA and Ukrainian professionals and parents. Each ECHO session includes a case presentation submitted by one of the participants. The case is discussed and recommendations are provided. This is followed by a brief didactic which matches the primary topic of the case. One ECHO session a month is focused on cases of children traumatized by the war. We highlight strategies providers can easily teach and families implement to address mental health issues related to the war. Sessions are archived allowing access to providers who cannot participate on a given day. We conduct post-ECHO surveys of participants including questions on # of internally displaced children in their practice, satisfaction with topics and materials presented, and strategies providers have shared.

Results: To date we have conducted 34 ECHO sessions with more than 150 participants, many are regular participants. Participants represent many regions of Ukraine including Ivano-Frankivsk, Lviv, Chernivtsi, Kyiv, Zhytomyr, Poltava, Dnipro, and Kharkiv. They are psychologists, teachers, speech therapists, child psychiatrists, and other health care providers. Participants report caring for up to 15 internally displaced children in their practices. They also report high satisfaction and increased knowledge with sessions; for example, asked whether sessions met their needs, 79% participants rated sessions met their needs very well and 21% well. 100% of participants report incorporating information and materials from our last 3 sessions in their practices. Data collection on # of strategies shared by participants with families and child outcomes is on-going.

Conclusions: We present ECHO Ukraine project information to highlight an effective method for continuing professional education even during wartime. We are continuing our qualitative research on the effectiveness of our approach. It has been a remarkably cost-effective approach as participants are only charged a small administrative fee which has been waived during the war.

406.309 Efficacy, Implementation Pace, Accelerators and Inhibitors of a Train-the-Trainer Model for the W.H.O. Caregiver Skills Training in the Public Health System

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Background: Common barriers to successful implementation of evidence-based parent-mediated interventions (PMIs) in public healthcare include lack of trained professionals and incompatibility with existing service delivery systems. Train-the-Trainer models (TtT) hold great potential for dissemination; however, little is known about large-scale implementation of TtT models for PMIs.

Objectives: To describe the design and implementation of a TtT model for the WHO Caregiver Skills Training (CST) in the Italian National Health Service (INHS). Specifically, we examined the model's: a) efficiency (fidelity, completion rate and pace); b) feasibility; and c) accelerators and inhibitors of long-term sustainability.

Methods: Twenty-eight clinicians (psychologists, child neuropsychiatrists, speech-and-language therapists, occupational therapists) from 10 Regions participated in a 4-phase TtT adapted from the standard WHO model (Table 1). At endpoint, participants rated the feasibility of phase-specific training components on 0-4 scales and participated in focus groups. Thematic analysis identified accelerators and inhibitors of long-term sustainability in routine practice; subsequently, these were classified by domains of the Consolidated Framework for Implementation Research (CFIR).

Results: Across Phases, 8 (28%) participants were lost: 7 dropped out (extended leave: n=3, lacking institutional support: n=4) and 1 did not meet fidelity criteria (Phase 2). Twenty trainees (72%) qualified as Master Trainers (MTs; Phase 4); of these, 15 (75%) completed facilitator training within 1 year. Most MTs completed each phase within the expected timeline (Table 1). In Phase 3, the 80% cutoff for fidelity of strategy use was met on average with 2.65 submissions ($SD=1.14$; range: 2-6); 89% of group sessions met full integrity criteria. Respondents to the post-training survey (n=18) reported high levels of post-training satisfaction ($M=3.92$, $SD=0.07$) and readiness to train facilitators ($M=3.42$, $SD=0.51$) but intermediate levels of institutional support across phases ($M=2.60$, $SD=0.28$; lowest for Phase 4: $M=2.19$, $SD=1.38$). Overall feasibility ratings were in the mid-range ($M=2.05$, $SD=0.30$). Implementation accelerators included characteristics of the individuals (motivation, readiness to change, experience) and of the intervention (response to patients' needs, accessibility, perceived efficacy). Most of the inhibitors were related to inner setting and outer setting factors, and some process components: training structure (facilitators recruitment, compatibility and adaptability to workload), INHS organization (including structural characteristics, communications, leadership engagement, available resources and lack of integration in current care pathways) and the need for formal recognition of MTs (credits, incentives, partnerships and policy) (Figure 1).

Conclusions: While highly appreciated by MTs, the TtT model's efficiency and overall feasibility was impacted by two main factors: lack of institutional support at key stages and significant constraints related to the limited time available for additional activities on top of their high regular workload. In some sites, this led to delays in pilot implementation and recruitment of facilitators. Additional challenges with the potential to threaten the scale up and long-term sustainability included the intensity of execution of facilitator training, due to geographical distance, excessive turnover, and lack of formal agreements and policies. Possible solutions may consider the adaptation of facilitator training to remote delivery, stipulating interorganizational agreements, and providing intrinsic/extrinsic incentives for more effective engaging of MTs as implementation "champions".

**406.313** Evaluation of Autism Training for Emergency Medical Providers

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Background: Medical providers receive minimal training in autism spectrum disorder (ASD), and it is essential that all medical personnel can optimally care for their autistic patients. Few studies assess the effectiveness of autism-specific behavioral health trainings for emergency providers. As part of a city-wide behavioral health initiative, we created and conducted an autism training for a specialized group of emergency medical providers. Through this initiative, emergency medical services are deployed, without police officers, following 911 mental health calls. The purpose of this initiative is to de-escalate and provide support and resources in response to mental health crises.

Objectives: Evaluate a targeted presentation for emergency medical providers on ASD and assess differences in responses by trainee age and level of education.

Methods: We created a 90-minute autism training that was delivered virtually (during the COVID-19 pandemic) and in-person to specialized medical providers, including emergency medical technicians, paramedics, and social workers. The training concentrated on: 1) understanding the range of autism phenotypic presentations across the lifespan; 2) tips for assessing and interviewing autistic individuals following a 911 call; 3) evidence-informed strategies to support autistic individuals in crisis situations, such as using visuals and accommodating sensory needs; and 4) use of case presentations to support understanding. Following the training, we collected sociodemographic information and attendees completed the following scales: modified version of the Confidence in Coping with Patient Aggression Instrument (Thackrey 1987), assessment of knowledge of evidence-informed strategies for working with autistic youth (Donnelly et al., 2023), and a modified version of the Appeal subscale of the Evidence-Based Practice Attitude Scale (EBPAS; Aarons 2004).

Results: Results indicated that attendees ($N = 86$) found the training to be appealing ($M = 4.38$ on 5-point Likert scale). Trainees with master's degrees indicated that the training made more sense to them and was more intuitively appealing to them in comparison to trainees with other levels of education ($p < .05$). No significant differences were observed by age or education level in terms of attendees' confidence levels. However, we observed a trend towards significance as attendees with an associate's or bachelor's degree reported higher levels of comfort in working with autistic patients than attendees with a high school or master's degree ($p = .05$). Trainees with a master's degree identified the highest level of correct responses on the autism knowledge assessment ($p < .05$), although no differences were observed across age groups.

Conclusions: Overall, emergency medical providers found the training to be engaging and appealing, a promising result given the lack of available trainings on autism for medical professionals. We observed differences in confidence and knowledge by level of education; however, this finding does not necessarily represent attendees experience in the field. Although the training was well-received, the range of responses on the post-training knowledge assessment suggests that additional trainings are necessary to comprehensively support autistic individuals during 911 mental health calls.



406.314 Evaluation of Community Implementation of the World Health Organisation-Caregiver Skills Training (WHO-CST) Program in a Lower-Middle Income Country

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Background:

In recent years, multiple parent-mediated early intervention models have shown to be feasible and effective in controlled settings, yet research on long-term sustainability is limited. Based on a task-shifting approach, the World Health Organization Skills Training (WHO-CST) is a structured caregiver-mediated intervention developed to expand access to early intervention for children with neurodevelopmental conditions like autism, especially in under-resourced regions. It is currently in various stages of adaptation and implementation across more than 35 countries globally, including India, where it was introduced in 2017.

Objectives:

This study is one of the first to evaluate community implementation of the WHO-CST program in India by community-based organizations trained between 2020-22 by exploring stakeholder perspectives on (i) outcomes for the three stakeholder groups- organizational heads, facilitators, and caregivers (ii) factors influencing implementation and sustainability of the program.

Methods:

The WHO-CST was field-tested in India, culturally adapted, and translated into three Indian languages between 2017-20. Between 2020-22, three master trainers subsequently trained 26 facilitators nominated by ten community-based organizations (therapy-centers and special-needs schools) from different Indian cities on the WHO-CST curriculum, followed by supervision using video-feedback to attain fidelity. The current study utilized a mixed-methods approach, including a survey and 28 semi-structured qualitative interviews with heads of organizations, facilitators, and caregivers. Reflexive thematic analysis was used to identify themes inductively instead of using pre-existing implementation frameworks to allow space for novel culture-specific concepts or factors to emerge.

Results:

Nine out of ten organizations implemented the WHO-CST once; only four have since sustained it successfully. Of the 26 facilitators trained across ten sites, 11 no longer work with the organizations; seven facilitators continue to offer the WHO-CST at their sites.

Qualitative analysis identified four broad themes in the following areas: 1) WHO-CST was appreciated for its novelty and for *bridging the gap* in knowledge and skills for all stakeholders, with each group identifying specific ways in which the program helped build caregiver skills to promote communication and better understand behaviors of concern in children with autism and other communication delays; 2) the program is *inclusive* and can potentially be implemented across diverse community settings like therapy centers, schools, and clinics; 3) *implementation was challenging* as it required a significant investment of time and effort, with organizational heads and facilitators identifying complexity of various components of the WHO-CST training, acquiring competence, and the logistics of managing the program as crucial factors that impacted organizational decisions to continue with the WHO-CST and 4) heads and facilitators felt that prolonged *commitment and organizational investment* is needed to implement and sustain WHO-CST.

Conclusions:

All three stakeholder groups acknowledged the immediate benefits of the WHO-CST. Though the WHO-CST program addresses gaps in specialized services for children with autism in LMICs, several factors need to be considered for its sustainability. The duration and intensity of the training needs to be re-evaluated along with increased attention to crucial implementation factors like adequate logistical planning and support required to sustain such an intensive program by community-based organizations.

406.315 Examining Caregiver Stress, Confidence, and Child Externalizing Behaviors across an Early Intervention (EI) Program
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Background: Caregivers of children with autism spectrum disorder (ASD) generally experience elevated levels of stress compared to caregivers of typically developing children (Bonis, 2016). Caregiving stress and level of parenting efficacy have been found to impact children's problem behaviors in different ways (Rodriguez et al., 2019; Strauss et al., 2022). Early Intervention (EI) for ASD sometimes includes caregivers, but research primarily focuses on child outcomes (Sandback et al., 2023). Our EI program includes caregiver-focused services such as caregiver coaching, support groups, and psychoeducation groups, in an effort to promote caregiving skills and feelings of efficacy. We sought to evaluate caregivers' stress and confidence levels in their own caregiving skills and examine how these impact child externalizing behaviors.

Objectives: The present study aims to investigate changes in caregivers' stress following participation in an EI program, as well as potential correlations between stress, confidence, and child externalizing behaviors.

Methods: Data collection is ongoing. Presently, data was obtained from 36 families who participated in our ASD clinic's EI program. At the beginning of EI, participants ranged in age from 21.7 to 37.6 months ($M=29.22$, $SD=4.18$). Most participants were boys ($n = 26$; 72.2%). Racial make-up included White (61.1%), Black or African American (16.7%), Asian (13.9%), and other or missing (5.6%). Caregivers completed measures upon entrance to the EI program and at completion approximately six months later, including the Parenting Stress Index Short Form (PSI-4-SF), the Child Behavior Checklist for ages 1.5-5 (CBCL), and questions regarding caregiving confidence from our clinic's intake and post-program questionnaires.

Results: Before the EI program, confidence in caregiving skills and caregiver stress were not related ($ps > .181$). However, after EI completion, increased caregiving confidence was significantly related to decreased stress across all domains (PSI Parental Distress: $r(21) = -0.62$, $p = .003$, PSI Parent-Child Dysfunctional Interaction: $r(21) = -0.81$, $p < .001$, PSI Difficult Child: $r(21) = -0.68$, $p < .001$). These findings remained true even when controlling for initial stress and confidence levels ($\beta = -0.65$, $p = .047$; $\beta = -0.83$, $p < .001$; $\beta = -0.60$, $p = .007$). Many child externalizing behaviors were associated with higher caregiver stress across subdomains (see Table 1). Before the program, caregiver distress was associated with children's ADHD symptoms and attention problems. After EI, caregiver distress was associated with children's ADHD symptoms, attention problems, aggressiveness, and more emotional symptoms.

Conclusions: These findings have implications for understanding how EI programs impact not only children with ASD, but their caregivers as well. Our findings indicate that as caregiver confidence increases following participation in an EI program, stress levels decrease. Further, the results demonstrate that higher caregiver stress is associated with higher levels of child externalizing behaviors. While the sample size is too small to evaluate mediation models, these findings may suggest that elevated stress levels hinder effective caregiving, therefore increasing child externalizing behaviors. It is also possible that challenging behaviors increase stress levels and lower caregiving confidence. Future research, with larger samples, is needed to understand the directionality of these relationships. The results suggest that placing a greater emphasis on caregiving self-efficacy may be beneficial in improving EI programs for families.



406.316 Examining Dental Resident Learning Following Participation in an Interdisciplinary, Neuro-Affirming Training Program
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Background: Dentists report difficulty in completing dental examinations for autistic patients due to behavioral, social communication, and sensory differences (Chandrashekhar & Bommangoudar, 2018). There is a need to promote neuro-affirming care in dental settings (Lai et al., 2011). However, due to lack of training in autism and evidence-based behavior strategies, dental providers often feel ill-prepared to treat this population (Alumran et al., 2018).

Objectives: An interdisciplinary team consisting of a physician, behavior analyst, psychologists, attending dentists, and dental residents established a sensory-friendly dental program (SFDP) and corresponding training initiative at an urban hospital primarily serving Medicaid patients from minority ethnic and racial backgrounds. The initiative aimed to provide neuro-affirming dental care by training dental residents in evidence-based behavioral health strategies (e.g., ABA, CBT, sensory-based) to support autistic patients.

Methods: Anonymous surveys were administered to dental residents at the conclusion (n=7) of their training year. Questions examined feasibility and acceptability of SFDP, and learning outcomes for dental residents. Likert scale questions were rated on a 5-point scale ranging from 1 (strongly disagree) to 5 (strongly agree).

Results: Residents reported agreement (n=4, 57.1%)/strong agreement (n=3, 42.9%) to feeling comfortable treating autistic patients; agreement (n=2, 28.6%)/strong agreement (n=5, 71.4%) regarding SFDP feasibility and acceptability; agreement (n=1, 14.3%)/strong agreement (n=6, 85.7%) that all residents should participate in SFDP; agreement (n=2, 28.6%)/strong agreement (n=5, 71.4%) to better understanding autistic traits impacting dental care; agreement (n=1, 14.3%)/strong agreement (n=6, 85.7%) to feeling better equipped to provide care to autistic patients; agreement (n=2, 28.6%)/strong agreement (n=5, 71.4%) to feeling better equipped to work with caregivers of autistic patients; agreement (n=2, 28.6%)/strong agreement (n=5, 71.4%) to better understanding the purpose of SFDP behavioral strategies; agreement (n=4, 57.1%)/strong agreement (n=3, 42.9%) to feeling better equipped to implement SFDP strategies; agreement (n=4, 57.1%)/strong agreement (n=3, 42.9%) to feeling the didactic lecture was helpful; agreement (n=2, 28.6%)/strong agreement (n=5, 71.4%) that the collaborative review/intake discussion before appointment was helpful; agreement (n=3, 42.9%)/strong agreement (n=4, 57.1%) that collaborating with the BH team during patient appointments was helpful; agreement (n=2, 28.6%)/strong agreement (n=5, 71.4%) that observing the BH consult during appointment was helpful; agreement (n=1, 14.3%)/strong agreement (n=6, 85.7%) that debriefing with the BH team after appointment was helpful; and strong agreement (n=7, 100%) that observing an autism evaluation in BH clinic was helpful. Residents endorsed the individual benefit from each training area (Figure 1).

Conclusions:

Neuro-affirming training in pediatric dental residency programs may lead to increased comfort and skills working with autistic patients. These results highlight the importance of behavioral health collaboration with dentistry to prepare dental residents to adapt care for autistic patients.



406.317 Examining the Barriers and Facilitators to Service Provision for Autistic People in Ireland: A Survey of Psychiatrists
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Background: Autistic people have high levels of mental ill-health and an increased risk of suicide across the lifespan. Yet autistic people report difficulties communicating with healthcare professionals and accessing a range of healthcare services. At the same time, mental healthcare workers in other jurisdictions are reporting links between confidence when working with autistic patients and the degree of autism knowledge and training they can access.

Objectives: To examine what factors helped or hindered Irish mental healthcare colleagues when working with autistic healthcare service users.

Methods: An online survey using quantitative and qualitative metrics was circulated among psychiatrists who are members of the College of Psychiatrists of Ireland, both in training and at consultant level, from December 2021 to May 2022. 128 psychiatrists completed the full survey.

Results: Knowledge of autism was high among psychiatrists, but self-efficacy scores were variable, particularly in relation to care pathways. Self-efficacy was better among psychiatrists with caseloads of children and youth or individuals with co-occurring intellectual disabilities. Reflexive thematic analysis identified three key themes relating to capacity and training of mental health professionals, ways to improve mental health services provision for autistic people and the critical need for co-creation and neurodiversity affirmative care.

Conclusions: The study highlighted critical systemic and professional challenges in providing mental health care to autistic people in Ireland. We provide recommendations for reducing these challenges and to enable the development of inclusive, evidenced-based care to autistic people across the lifespan.



406.318 Examining the Reach of a Web-Based Service Navigation Tool for Black Families of Autistic Children
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Background: Despite reports of increased prevalence rates of autism spectrum disorder (ASD) among Asian or Pacific Islander, Hispanic, and Black children, Black families continue to experience disparities in access to autism-related services (Liu et al., 2023). Researchers highlight the importance of culturally sensitive resources to aid Black families at various points along the diagnostic evaluation process and beyond (Fannin et al., 2024). Thus, a web-based service navigation resource was created in partnership with stakeholders from the Black community to aid in increasing Black families' connection to early intervention services, with a specific emphasis on rural Black families.

Objectives: The purpose of the current study is to examine the feasibility and viability of this web-based resource. In particular, this study aims to assess 1) whether this tool reaches families in rural areas 2) regional differences in device types used to access the website, and 3) regional differences in webpages visited by families.

Methods: Google Analytics, a web-based analytic tool, was used to track and measure user traffic to the website. The individual metrics relevant to the study's objectives included pageviews, which were further broken down by city/state-level data and device type. Metrics were compiled and analyzed via a Chi-square test (aim 2) and regression analysis (aim 3) to answer the research questions.

Results: Results indicated that the web-based resource reached 40 rural counties in the targeted state (50%). Of users from rural areas, 61% visited from a desktop and 39% from a mobile device. In urban areas, 64% visited from a desktop and 34% from a mobile device. Of users from suburban areas, 82% visited from a desktop and 17% from a mobile device. There was a significant difference in device type used for access between regions ($\chi^2=34.47$, $df=2$, $p<.001$). Specifically, hits from suburban regions were significantly more likely to be via desktop rather than mobile, compared to hits from rural regions (OR = 3.08, 95% CI 1.91, 4.97) or urban regions (OR = 2.54, 95% CI 1.82, 3.60). There were no significant differences in device type between rural and urban counties ($p=.41$).

Analysis of Google Analytics data also indicated that the top 3 webpages that are most visited include 1) the main webpage, 2) "What is BFAST?", and 3) Build Your Team. Compared to rural counties, urban counties were significantly associated with approximately one additional hit per 10,000 residents ($p=.03$, 95% CI 0.09, 2.13). There were no significant differences in hits per 10,000 residents between rural and suburban counties ($p=.07$, 95% CI -0.05, 1.40). When outliers were excluded, these results did not meaningfully differ.

Conclusions: This study provides preliminary confirmation that a web-based service navigation tool for Black families of autistic children has the ability to reach families living in rural areas. While Black families in rural areas continue to face barriers to accessing autism-related services, web-based service navigation resources may aid in closing gaps in access to knowledge and resources. Implications related to regional differences will be further discussed, in addition to study limitations and future directions.

406.319 Examining the Relationship between Treatment Usage and Executive Functioning Among Autistic Youth

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Background: Recently, executive functioning (EF) has become an area of focus among research in autistic youth, with literature suggesting that EF problems likely contribute significantly to developmental and mental health outcomes in autism (Pellicano, 2012). Among specific barriers examined regarding access to treatment services for autistic youth, EF was found to be one of three key barriers (Adams et al., 2021). Despite this, limited research has examined how treatment usage might differ for autistic children with EF challenges. This information can provide important insights into key considerations when considering and tailoring various treatment modalities for addressing challenges in autistic children with EF difficulties.

Objectives: The current study seeks to clarify the relationship between participation in psychosocial and medical treatment services and EF in a community sample of autistic youth.

Methods: Fifty-seven autistic youth (Mage=10.65, SDage=3.28; 71% male; 47.7% White, 19.9% Asian/South Asian/MENA, 4.6% Black, 21.5% Multiracial) from a Northeastern US region participated in the current study. All participants met research criteria for autism or autism spectrum on the ADOS-2. Parents reported on history of receiving services and EF (Behavior Rating Inventory of Executive Function-2; Gioia et al., 2015), which yielded Emotion Regulation Index [ERI], Behavior Regulation Index [BRI], and Cognitive Regulation Index [CRI] scores.

Results: Of the fifty-seven autistic youth, parents indicated 55% receiving school-based IEP services, 58.1% psychiatric treatment, and 36% medical treatment, either currently or in the past. Psychiatric treatment services included inpatient (5.6%), early intervention (EI; 55.6%), applied behavior analysis (ABA; 54.5%), social skills training (SST; 65.8%), speech therapy (ST; 85.4%), occupational therapy (OT; 88.1%), and individual counseling (IC, broadly defined; 82.9%). Medical treatment services included medication (58.1%) and medical intervention (MI; 36.8%). Medications were reported as prescribed for mainly ADHD, anxiety, and depression. Miscellaneous treatment services were reported by 19% of the autistic youth sample. Point-biserial correlations indicated that CRI correlated with receiving ST ($r=.46$, $p<.01$) and OT ($r=.49$, $p<.01$). BRI correlated with receiving EI ($r=.40$, $p<.05$), ABA ($r=.45$, $p<.05$), ST ($r=.40$, $p<.05$), OT ($r=.41$, $p<.01$) and PT ($r=.47$, $p<.01$). ERI was positively correlated with receiving ABA ($r=.44$, $p<.05$) and PT ($r=.44$, $p<.05$). Use of SST, IC, and MI were not significantly related to EF.

Conclusions: Results suggest that most autistic youth in the current sample are receiving various services. However, it is notable that approximately half of the autistic youth sample had not received any past or current treatment services, despite the majority being socioeconomically advantaged. Moreover, our findings suggest associations between specific EF challenges and receiving certain treatment services in autistic youth, with behavioral EF challenges associated with more treatment approaches. Specific EF challenges have been shown to indirectly and directly affect quality of life via challenging behaviors, implicating the importance of effective treatment (Frazier et al., 2022). Given differences in EF challenges may relate to receiving specific treatment interventions, future research should consider factors that impact treatment decisions in order to take a more tailored approach to planning how to best support autistic youth based on specific EF challenge profiles.



406.320 Exploring Teacher Affect Among Neurodiverse Students in TK-5th Grade General Education Classrooms

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Background: Teacher affect is a feature of teacher talk evaluated by observing teachers' facial expressions, vocal tones, body posturing, and body movements (McLean & Connor, 2017). Although limited, studies found positive teacher affect within general education settings is associated with academic outcomes (e.g., Burić, 2019). There is limited understanding of whether and how teacher affect varies within interactions involving autistic students.

Objectives: This study explored variability in affect among autistic student and nonautistic students and links between affect with relationship quality and teacher perceptions of student developmental skills and behaviors within TK-5th grade general education inclusive classrooms.

Methods: Participants were recruited as part of a 4-year study examining teacher-student interactions among neurodiverse students in general education classrooms (R324A210288). Trained staff administered a battery of academic measures, teachers completed questionnaires, and video observations were collected. Participants for this study included general education teachers ($N = 17$) and their autistic and nonautistic students ($N = 40$; $M_{age} = 6.7$; $SD = 1.49$). Baseline scores from the DAS-II (Elliot, 2007) were used to assess cognitive skills, the Vineland-3 (Sparrow et al., 2016) to assess adaptive behavior, and the STRS-SF (Pianta, 2001) to assess student-teacher relationship quality. Using video observations from the first two years of the larger study, we examined teachers' affect following students' communication initiations using the *Autism Teacher Affect Measure* (ATAM; Vega Garcia & Sparapani, in preparation), an adapted observational tool (McClean & Connor, 2024). The ATAM provides a frequency count of teachers' responses (contingent, not contingent) and affect types (positive, negative, neutral).

Results: Preliminary data is reported on 14 autistic TK-5th grade students ($M_{age} = 6.8$; $SD = 1.71$) and their 14 teachers. Students exhibited a range of communication initiations directed toward their teachers or not clearly directed; teachers responded to 37% of their initiations, on average. The majority (76%) of these responses were contingent (following the student's lead) and positive (i.e., content or warm). 19% of the teachers' responses showed negative affect (i.e., dismissive or harsh)—this talk was often used to redirect student behavior. See Table 1. 12 students received at least one contingent, positive response from their teachers, while 6 received at least one non-contingent, negative response (Table 2). Using Spearman correlations, a negative, moderate relation between contingent, positive responses and cognitive functioning approached significance ($r = -.51$, $p = .06$). There were no significant relations with teacher affect, students' adaptive skills, and relationship quality when controlling for cognition.

Conclusions: This study provides a snapshot of teachers' response and affect types following their students' communication initiations. Whole class instructional constructs might limit teachers' capacity for individual responding; hence, this finding needs further investigation. Negative response patterns might indicate a misinterpretation of student communication, which is consistent with the current literature (e.g., Hosotani & Imai-Matsumura, 2011). Non-significant findings might be due to the small sample size. We plan to include a larger sample of neurodiverse students as a next step.



406.321 Exploring the Impact of Child Opportunity on Engagement in Services and Diagnostic Timelines for Young Autistic Children in Rural Areas

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Background:

Autism is a neurodevelopmental condition marked by challenges in social communication and repetitive behaviors, with early diagnosis linked to better outcomes for young children (Maenner et al., 2023). However, disparities in access to autism-related services persist in rural areas due to geographic and socioeconomic barriers (Malik-Soni et al., 2022). Community factors including rurality and community resources may impact the timing of diagnosis and service access and use. This study examines the relationship of community factors with age of diagnosis and service engagement for autistic children aged 12-60 months across three US states (North Carolina, Missouri, and Kansas).

Objectives:

1. Investigate how community factors influence age of autism diagnosis.
2. Explore the association between community factors and engagement in autism-related services.

Methods:

This study is a secondary data analysis from the Following Language Growth in Autism at Home (FLASH) study, which includes 269 children (192 male, 77 female) aged 12-60 months from North Carolina, Kansas, and Missouri. The participants are racially/ethnically and socio-economically diverse (46% non-white; 37% families with household income < \$40K). The sample will be expanded to include participants from a national cohort through telehealth recruitment, with an anticipated additional 150 children from diverse geographic areas.

The community factors will be measured in two ways: the Child Opportunity Index (COI) and the National Center for Health Sciences (NCHS) Urban-Rural Classification Scheme. COI scores are determined by US Census tracts (~1,500 housing units and 4,000 people). We used the overall COI score and three COI subscales of education, health and environment, and social and economic domains. The NCHS Urban-Rural Classification Scheme is a system used to categorize US counties, based on population size and urbanization, into 6 different categories. The dependent variables are number of visits for several autism-related services (e.g., SLP, OT, ABA) and age of autism diagnosis in months.

We used regression models to examine associations between overall COI and individual COI sub-scores (education, health and environment, social and economic) and service engagement (number of sessions). For the conference, we will also examine community factors impact on age of diagnosis controlling for autism symptomatology. We will also expand all analyses to include approximately 125 additional participants that were recruited across the US through the SPARK database.

Results:

Preliminary analyses showed that the education domain significantly predicted speech-language and ABA therapy sessions, while the social and economic domain was associated with physical therapy and ABA sessions, indicating that lower opportunities in these areas were linked to reduced engagement. The overall COI score was also significantly associated with increased ABA sessions, whereas the health and environment domain did not predict engagement across services.

Conclusions:

The findings suggest that focusing on specific COI domains is more effective in understanding disparities in service use. This approach aims to provide a more comprehensive understanding of how community factors influence diagnosis and service engagement, ultimately guiding efforts to promote equity in autism care.



406.322 Exploring the Landscape and Effectiveness of Teacher Trainings on Autism Spectrum Disorder: A Systematic-Narrative Hybrid Review

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Background: The rising prevalence of autism spectrum disorder (ASD) has led to an increase in students on the autism spectrum in schools, underscoring the need for teachers who are prepared to support the learning and behavior of these students. Despite this need, teachers worldwide report limited knowledge about ASD and low self-efficacy to support autistic learners. ASD professional development (PD) opportunities for teachers may address this issue; however, research is needed to identify best practices for designing effective and accessible PD opportunities for this population.

Objectives: The present review aims to 1) provide a better understanding of the existing landscape of teacher PD on ASD and 2) identify which content (e.g., topic), modalities (e.g., virtual, in-person), and features (e.g., coaching, role play) of these trainings may contribute to improved teacher outcomes and enhanced preparedness to support autistic students.

Methods: This review employs a systematic-narrative hybrid literature review methodology (Turnbull et al., 2023) to address the present aims. An electronic search was completed in January 2024 using the search concepts “teacher,” “training,” and “autism” to generate search term combinations. To be included, studies had to discuss a training on an autism-related topic; include a training audience of in-service general or special educators (PreK through 12th grade); and discuss training content and modality and at least one post-training teacher outcome. 640 articles were screened by title and abstract, resulting in 134 articles screened via full text to determine a final sample of included articles. An overview of the complete search strategy is shown in Figure 1.

Results: 33 articles were eligible for inclusion and were synthesized by training content, modality, features, and teacher outcomes. Student and feasibility outcomes were also included where reported. Findings across 16 countries and five continents (Figure 2) indicated that nearly 80% of studies reported improvement in one or more teacher outcomes following training. The most common content area covered was interventions/evidence-based practices, with results suggesting that effectiveness of training topic varied based on host country. Improved teacher outcomes were most common among studies employing hybrid training modalities, suggesting that a delivery format combining virtual and in-person components may be ideal for teachers who face competing demands for their time and/or accessibility barriers to obtaining PD. Trainings which allowed teachers opportunities to practice their skills and receive feedback or coaching appeared to positively impact teacher outcomes. Teacher improvements were often associated with improved student outcomes (when reported), suggesting that teacher improvements led to student improvements. Feasibility outcomes indicated that teachers generally perceived ASD trainings to be beneficial.

Conclusions: This review highlights the promising potential benefits of ASD PD when teachers are provided with access and opportunities to obtain training. Strengths of this review include representation of countries underrepresented in ASD research and breadth in content, modality, features, and outcomes among included trainings. Future recommendations include larger study sample sizes, expansion of training content to consider students of varying developmental levels and support needs, and incorporating input from autistic self-advocates, families, and teachers in the development of future trainings.



406.324 Family Support Needs Following an Autism Spectrum Disorder (ASD) Diagnosis

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Background: While early identification has been recognized as critical for children with autism spectrum disorder (ASD), the immediate period following an ASD diagnosis is also a crucial time for establishing interventions and early support. Research indicates that specific ASD resources provided during early childhood can significantly improve developmental outcomes. Guardians and caregivers play an integral role in post-diagnosis stages, as they provide support, facilitate communication, and deliver essential care for children with ASD. Guardians of children with ASD experience high levels of stress both before and after diagnosis. Further, elevated rates of anxiety and depression are seen among guardians of children with ASD, notably higher than those observed in guardians of children with other developmental or physical disabilities. While the impacts of an ASD diagnosis on guardians have been studied, our understanding of the unmet needs of families of young children recently diagnosed with ASD remains limited.

Objectives: This study was part of a larger contract between a university and state health department. The study aimed to increase ASD diagnostic opportunities through a telehealth assessment pilot for children enrolled in Early Intervention (EI) services who scored as high-risk on an autism screener. Following low attendance at post-diagnosis webinars offered for guardians, this study aimed to identify specific gaps in the service delivery of the pilot and assess post-diagnostic needs of families, as experienced by both guardians and EI service providers.

Methods: Through qualitative data collection, EI providers and guardians of young children recently diagnosed with ASD were surveyed. Guardians and EI providers were asked about outstanding questions, desired post-diagnosis support, barriers to obtaining care, and services already received. Qualitative data was analyzed through thematic coding using MAXQDA-v24 software.

Results: In total, 16 families and 8 EI providers participated in the study; the majority (N=15) of families were from rural areas. Thematic analysis revealed five key themes surrounding family needs: (1) uncertainty about next steps post-diagnosis, (2) barriers such as cost and insurance complications, (3) the need for clearer and timelier referrals, (4) the desire for ongoing intervention support, and (5) the importance of emotional and social support for caregivers. Notably, both caregivers and EI providers identified similar unmet needs, with some differences appearing in the types of referrals and social support the two groups highlighted. Findings also revealed guardians' desire for further contact from the diagnostic team, with 69% of respondents stating that additional contact post-diagnosis would have been beneficial.

Conclusions: Caregivers and EI providers have clear and consistent perspectives of shared challenges during this critical period for families of young children recently diagnosed with ASD. These challenges indicate a need for specific connections to community-based referrals and interventions and help navigating barriers. All participants highlighted the need for structured guidance, including professional and peer reassurance and support. These findings can help inform and guide the development of targeted interventions in low-resource communities to improve service delivery systems for families of young children recently diagnosed with ASD.



406.325 Fidelity Measures of Job Coaching Interventions That Support Autistic Youth and Adults in Obtaining and/or Maintaining Paid Employment: A Narrative Review

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Background:

High unemployment rates among autistic adults are reported globally. Supported employment, including job matching, training, and ongoing support like job coaching (JC), can address this challenge, increasing retention in paid employment. JC assists autistic adults by providing various supports to address personal and work-related barriers (e.g., accessing job accommodations, modifying tasks, developing compensatory strategies, delivering behavioural interventions, skills training). The effectiveness of JC is best determined by evaluating implementation quality, specifically through assessing fidelity—how well the intervention is delivered as intended. Standardized fidelity evaluation, such as using a fidelity measure, ensures consistent, high-quality coaching, aiding the broader reproduction of successful programs. Limited understanding exists of how to evaluate JC fidelity. Examining how JC is measured in literature is the first step in establishing best practices for supported employment in autism.

Objectives:

This narrative review examines JC fidelity measures used in employment programs supporting autistic individuals in obtaining or maintaining competitive employment over the last decade.

Methods:

A comprehensive secondary analysis is being conducted using data from an ongoing review that aims to describe the published literature on job coaching for autistic youth and adults. From this pool of studies, research that specifically evaluates job coaching using fidelity measures is being selected concurrently for this secondary analysis. Fidelity tools are being sought from authors if not provided in the selected papers. The search spans CINAHL, Medline, PsycInfo, Embase, Emcare, and Business Source Premier databases. The process involved title and abstract screening, followed by full-text screening to identify studies using JC fidelity measures. Inclusion criteria: (1) participants diagnosed with autism, (2) aged 15 years or older, and (3) receipt of JC. Eligible studies supported participants in obtaining or maintaining paid employment, used a fidelity tool, and were published from 2014 onward. Studies were excluded if participants were in sheltered workshops or if the paper was a review.

Results:

The original search identified 69 studies, 15 of which met most of the inclusion criteria for this analysis. At this stage, these studies either mentioned a fidelity tool or indicated some form of fidelity assessment, though the precise number of studies utilizing formal fidelity measures is still being determined. Further examination of the selected studies will confirm whether a specific measure was employed. The next steps involve collecting fidelity measures (from the articles or directly from authors) and extracting fidelity-related data (e.g., observer, in vivo assessment, frequency) as well as components of the measures (e.g., JC instructions, supports, prompts, pacing). The studies will also be categorized using the National Institutes of Health Behavior Change Consortium's Treatment Fidelity framework, which includes dimensions such as design, training, delivery, receipt, and enactment to assess comprehensive fidelity.

Conclusions:

This review will identify existing JC fidelity measures in employment programs for autistic individuals. The findings will describe specific characteristics of fidelity published in the literature. Findings from this work will outline best practices in fidelity evaluations and what to consider moving forward to improve JC implementation and outcomes for autistic youth and adults.

406.326 Filipino American Help-Seeking of Autism Treatment Moderated By Religious Support

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Background: With the apparent lack of representation in the literature, not much is known about the effects and impressions that parents of Filipino American communities have on autism diagnoses and treatments. A major issue experienced by immigrant families in the US with an autistic child or a child with a developmental disability diagnosis is not receiving adequate care (Lin et al., 2012). Despite the appalling disparities, these families were also more reluctant than non-immigrant families to report delayed/forgone care for their child. With nearly 79.5% percent of Filipinos identifying as Roman Catholic (Philippine Statistics Authority, 2017), religious roots run deep and help shape their cultural values and beliefs (Agbayani-Siewert, 1994). One aspect of the Catholic religion integral in the Filipino culture is the tradition of bringing fictive relatives (i.e., godparents) into the family network through the *compadre* (co-parent) system (Agbayani-Siewert, 1994). While research indicates low rates of mental health help-seeking among Asian Americans (Abe-Kim et al., 2007; Han and Pong, 2015), Filipino Americans seek mental health services at an even lower rate than average reports (Gong et al., 2003). Gong et al. found that nearly 75% of their sample of 2,285 Filipino Americans from the Filipino American Community Epidemiological Study (FACES; a strata-cluster study conducted from 1998-1999 in San Francisco and Honolulu) had never utilized any type of mental health service (2003). Additionally, the most frequently used source of care came from the lay system (e.g., family and friends), along with a moderate level of folk system utilization (e.g., priests, herbalists; Abe-Kim et al., 2004). While past research has indicated that rates of mental health-seeking behaviors are generally low for Filipino Americans (Tuazon et al., 2019), Abe-Kim et al. found that rates of help-seeking behaviors were similar for those reaching out to mental health specialists (2.9%) and religious clergy members (2.5%) for all respondents (2004). With the apparent barriers, Filipino-Americans may experience a range of cultural pulls when deciding how to care for their autistic child.

Objectives: The present study explored if the relationship between concern of autism and likelihood of seeking out treatment is moderated by parent religious support.

Methods: To analyze the relationship, Filipino Americans read a vignette portraying an autistic child and were asked how much of a concern they felt about the portrayed child and whether they would seek out treatment for the child. Additionally, participants filled out the Brief Multidimensional Measure of Religiousness/Spirituality (BMMRS; Fetzer Institute/ National Institute on Aging Working Group Report, 1999) to determine the importance that religious support plays in their lives.

Results: The relationship between participant concern of autism and likelihood for seeking treatment is significantly moderated by perceived support by their religious community, ($B = .422$, $SE = .115$, $t = 3.664$, $p < .001$).

Conclusions: These results show that perceived support within a religious community can affect help-seeking behavior for autism diagnosis and treatment on top of concern of autism symptoms. Overall, this shows the importance that support networks play in Filipino Americans' likelihood of seeking services for autism.

406.327 Findings from a Psychoeducational Intervention for Black Families Raising Autistic Youth

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Background: Given the increased diagnostic prevalence of autism among Black children (Maenner et al., 2023), Black caregivers raising autistic youth experience barriers to accessing autism-related services. The barriers experienced by Black families are unique and more nuanced than those experienced by non-Black families. Increasing Black caregiver advocacy may help reduce these diagnostic and service disparities. FACES (Fostering Advocacy, Communication, Empowerment, and Support) is a caregiver advocacy program designed to empower Black families to combat autism service disparities and to help strengthen equitable and inclusive access to autism supports (Pearson & Meadan, 2021). Previous findings indicate that FACES strengthens advocacy and service utilization (Pearson et al., 2022). Findings also suggest that training community-based parent educators to deliver FACES could facilitate program sustainability while making FACES more widely available to Black families.

Objectives: The purpose of this mixed methods study was to examine the impact of a train-the-trainer approach to prepare community-based providers to implement FACES. We assessed the training efficacy using a multiple-baseline, single-case experimental design across participants and we implemented a qualitative interview design to assess the training feasibility. Our research questions were: Is there a functional relation between the FACES Facilitator Training and community-based FACES Facilitators' fidelity of implementation of the FACES intervention? To what extent do parent educators perceive the FACES Facilitator Training as (a) feasible, (b) usable, and (c) likely to improve parent and child outcomes?

Methods: Phase one of this mixed method design included a multiple-baseline, single-case design across participants. Three community-based facilitators completed the 16-hour hybrid FACES Facilitator Training (FFT), which included 12 hours of online asynchronous training and 4-hours of in-person training. Following the FFT, participants implemented FACES across three sites with 15 Black caregivers. FACES was offered weekly, in person for three hours per session. To assess parent educators' fidelity to the intervention we conducted visual analyses of behavioral characteristics such as: (a) consistency of changes in level, trend, and variability within and across each phase and tier; (b) consistency of data and presence of overlap across phases and tiers; (c) projected patterns of the data; and (d) anomalies within the data (Kratonchwill, 2013). In phase two of the mixed method design, we conducted a series of semi-structured interviews with the FACES facilitators (before the training, after the training, and after their implementation of FACES). To analyze the qualitative data, we employed a constant comparative method (Corbin & Strauss, 2015). **Results:** Findings offer emergent evidence of the feasibility of the FACES train-the-trainer approach. Our findings also support the need for ongoing scaling and implementation of the FACES intervention. Preliminary qualitative data analysis indicates that the FACES Facilitator Training was feasible and acceptable. Data analysis is ongoing at the time of this submission, however, we will discuss the final results in detail, following our rigorous data analysis process.

Conclusions: The findings from this study will inform ongoing development of the FACES intervention and the FACES Facilitator training to better support Black autistic children across the lifespan and their families through a community-embedded psychoeducational intervention.

406.328 First-Hand Accounts of Autistic Students' Experiences in Work-Integrated Learning

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Background: Autistic adults in Canada face substantially higher rates of unemployment compared to the general population (Statistics Canada, 2017). Autistic adults are increasingly pursuing postsecondary education to benefit their employment outcomes (Cheriyen et al., 2021). Yet, they report that the services currently available in postsecondary institutions are insufficient and ill-fitting (Lucas et al., 2022; Wolpe, 2024). Work-integrated learning (WIL) programs provide experiential learning opportunities for postsecondary students, leading to numerous beneficial employment outcomes and offering an important opportunity for students to gain skills and work experience within a supported environment (Jackson et al., 2023). However, autistic postsecondary students are less likely to access WIL programs than students without disabilities and students from other disability groups (McLeod et al., 2019). Autistic students face several barriers in WIL programs, including a lack of autism-specific supports (Sullivan, 2023; Pesonen et al., 2021). While WIL programs have the potential to improve employment outcomes for autistic students (May, 2018; Janice et al., 2021), the lack of research and resources dedicated to making these programs accessible means they are not adequately supporting this population.

Objectives: This study aims to explore the perspectives of autistic students on the barriers and facilitators within Canadian WIL programs that impact their successful engagement.

Methods: Autistic postsecondary students currently enrolled in or who recently completed a WIL program are being recruited to participate in this study. Participants will complete a demographics form, two measures of employment readiness (Work Readiness Inventory (Brady, 2010) and Ansell-Casey Life Skills Assessment (Wittevrongel et al. 2022), and a semi-structured interview. The interview questions, created in collaboration with autistic researchers and community members, focus on the barriers and facilitators encountered in WIL programs, as well as suggestions for improving accessibility. Thematic analysis will be used to identify patterns across participant responses (Braun & Clarke, 2013).

Results: Data collection from 25 autistic participants will begin shortly, following thorough consultation with various stakeholders and a review of the literature. The study design and materials were created collaboratively by our team of autistic and non-autistic researchers and in consultation with various stakeholders. This participatory approach is expected to lead to meaningful results that not only accurately reflect the voices of those with lived experience but also provide concrete suggestions for improving the accessibility of WIL programs. Further, these results will contribute to a larger research project that examines the perspectives of different stakeholder groups in the WIL ecosystem (students, WIL Practitioners, and employers), ultimately informing the development of a publicly available, evidence-based online resource toolkit.

Conclusions: To address the gap in research examining autistic students' experiences in WIL programs, this qualitative community-engaged study seeks to capture and explore their perspectives and recommendations. By prioritizing the voices of students, this design allows for rich, nuanced insights that can inform future WIL practices. Our aim is to generate actionable suggestions that contribute to the development of an evidence-based resource toolkit.

406.329 Gender-Sensitive Approaches to Autism Identification: Addressing Policy Gaps in U.S. Public Schools

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Background: Autism identification relies on subjective judgment of behaviors thought to reflect core autism traits. Historical and ongoing exclusion of autistic females from research determining core autism traits suggests a male bias in conceptualization that puts autistic females at high risk for underidentification both clinically and educationally. Even when females are clinically diagnosed, they are much less likely than their male counterparts to receive special education services under autism eligibility. State-level variability in applying Individuals with Disabilities Education Act (IDEA) criteria may influence the overall prevalence of students served under autism eligibility, and this variability may be of particular concern for autistic females. However, no studies have examined the potential disproportionate impact of state-level practices on autism educational identification for males vs females.

Objectives: To investigate sex-related disparities in students served under autism eligibility within U.S. schools by analyzing state-level special education policies in relation to autism prevalence by sex.

Methods: Using state education agency (SEA) and legislative websites, we extracted special education policy information related to autism definition, assessment requirements, and team member mandates for all 50 states and Washington D.C. (hereafter referred to as states). We used U.S. Department of Education IDEA Section 618 State Part B Child Count Data and National Center for Education Statistics Tables 203.20 and 204.70 to calculate autism prevalence ratios for each of the 51 states overall and by sex. We will use multiple regression to analyze the relationship between coded policy variables, demographic variables (per pupil expenditure, number of students receiving free or reduced lunch), and autism prevalence overall and by sex.

Results: Preliminary results suggest a mismatch between state-level definitions (what autism is) and assessment mandates (how autism is identified). For instance, 49/51 states (96%) include some variation of "unusual responses to sensory experiences" in their autism definition for special education eligibility. Yet fewer than 20% of states require that a sensory processing assessment be conducted when evaluating to determine qualification for special education services under autism eligibility.

Conclusions: Autistic females report higher lifetime sensory symptoms, and research suggests that sensory processing assessment may discriminate between autistic and typically developing children with higher accuracy for females (89%) than males (75%). Thus, failure to mandate assessment of sensory processing for autism special education eligibility may contribute to disproportionate underidentification of autistic females in U.S. public schools. Overall, this research makes a crucial contribution by addressing systemic barriers to female autism identification, emphasizing the need for gender-sensitive policies and assessment practices. Our final results will have the potential to inform a new gold standard that improves the accuracy and equity of autism identification in educational settings.

406.330 Impact of Parent Education and Case Management on Access to ABA Therapy Services and Parent Satisfaction in an Early Intervention ABA Program

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Background: Children with autism spectrum disorder (ASD) receive recommendations for a range of services, accessed through different systems. Applied Behavior Analysis (ABA) therapy is often recommended and availability of parent education about how to obtain services is inconsistent. Wait times for ABA may exceed 1-2 years, often because families lack knowledge to navigate service systems. In an effort to potentially reduce wait times, the ABA Early Intervention (ABA EI) Program at Seattle Children's Autism Center provides intensive parent education and case management in the context of a short-term (3 months), center-based ABA treatment program, including a focus on how to access ongoing ABA following program discharge.

Objectives: The objective of this study is to highlight the parent support package included in the ABA EI Program, and to explore its effects on access to ongoing care and parent satisfaction from baseline to post-treatment. Access to care findings for ABA EI patients are compared to a population of children with ASD served in an outpatient clinic in order to examine how many children accessed ABA therapy across groups.

Methods: Participants thus far include 74 children with ASD, ages 18 months-6 years, and their parents. Children were selected from two groups: ABA EI participants (N = 42) or general outpatients (N = 32). To compare access to care across groups, an independent chart review was completed to determine if patients with referrals for ABA therapy were receiving it. Percent of children receiving ABA in each group was then calculated as the primary outcome measure. Secondary outcomes were evaluated using the ABA EI Parent Satisfaction Survey, collected at post-treatment.

Results: Data collection is ongoing. Preliminary primary outcome measure results indicate that 62% (N = 42) of children in the ABA EI program successfully accessed ongoing ABA therapy, compared to 18% (N = 32) of outpatients. Data are available on 137 additional ABA EI participants, and data collection is ongoing for both groups. Preliminary results from the ABA EI Satisfaction Survey include an overall mean satisfaction score of 4.95 (SD = 0.22; N = 20) on a scale of 1-5 (1 = unsatisfactory; 5 = very satisfactory). The Parent Self-Assessment of Knowledge and Confidence scores increased from M = 2.47 (SD = 1.44; N = 21) at baseline to M = 4.52 (SD = 0.51; N = 21) at post-treatment and M = 2.48 (SD = 1.43; N = 21) at baseline to M = 4.8 (SD = 0.44; N = 21) at post-treatment respectively.

Conclusions: Families receiving parent education and case management in the context of a brief ABA early intervention program successfully accessed ongoing ABA therapy services at a much higher rate than children receiving less intensive outpatient services. Parents reported high satisfaction with the ABA EI program and increases in self-assessed knowledge and confidence. These pilot findings suggest a focus on increased family support may be important for insuring families are able to navigate the complex service systems involved in caring for children with ASD.

406.331 Implementation Climate and Characteristics of Community-Based Agencies Serving Young Autistic Children in the U.S.: Preliminary Results

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Background: The rising number of young children being identified as autistic has led to exponential growth in for-profit community-based agencies (CBAs) that serve them. CBA providers often use highly structured approaches that may not be developmentally appropriate for young children which may limit the use of learned skills across settings and time. Naturalistic Developmental Behavior Interventions (NDBIs) integrate theory and strategies from applied behavior analysis and developmental science and are considered best practice for young autistic children. While NDBIs are a promising option for CBAs to better serve young autistic children, organizational change and adopting new practices is challenging. Examining implementation climate is an important first step to change, as a strong implementation climate is associated with successful adoption of new practices.

Objectives: This presentation will showcase a preliminary look at the implementation climate in CBAs nationally. These data were collected as part of a larger hybrid type 1 randomized controlled trial designed to examine NDBI effectiveness (specifically the Early Start Denver Model [ESDM]) in the community and to gather data on implementation determinants. This first look will provide a snapshot of the implementation climate in CBAs, informing understanding of implementation readiness.

Methods: CBAs across the United States that (a) accept public funding (e.g., Medicaid), (b) serve at least ten autistic children under age five from English- or Spanish-speaking homes, and (c) have not previously received training in ESDM participated in this study. All participating CBA providers completed the Implementation Climate Scale (ICS), a measure of climate for the implementation of evidence-based practices (EBPs) with strong internal consistency and construct-based validity in mental health populations. The ICS yields scores on six dimensions reflecting organization priorities and values related to the successful implementation of EBP: focus on EBP, (2) educational support for EBP, (3) recognition for EBP, (4) rewards for EBP, (5) selection for EBP, and (6) selection for openness. All scores range from 0 to 4, with higher scores indicating participants perceive their workplace to have excellent implementation climate.

Results: To date, 29 CBA providers across 4 agencies and 7 states have completed the survey, and data collection is ongoing. Providers identify as mostly female (n=26), not Hispanic or Latino (n=19), and White (n=20). The implementation climate at CBAs is low overall (M=2.5, SD=0.5), similar to previous literature examining school and mental health settings. The highest scoring dimension was Focus (M=3.7, SD=0.4) and the lowest scoring subscale was Rewards (M=0.7, SD=0.8).

Conclusions: This is the first study of its kind to examine implementation climate in CBAs across the United States. Preliminary results show low ICS scores across CBAs, which highlights the need to identify methods to improve implementation climate to support CBAs' abilities to provide accessible and effective best practices for young autistic children and their families.



406.332 Improved Appointment Completion at an Autism Specialty Clinic Following Intake Simplification and Introduction of Community Health Worker Support: Results from a Quality Improvement Project

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Background: Children from marginalized racial and ethnic groups and children whose families speak a language other than English encounter barriers to autism evaluation and care. An internal review confirmed that, within a large academic hospital system in the northeast, fewer than half of pediatric patients newly referred from its Community Health Centers (CHCs), which serve a racially, ethnically, and linguistically diverse patient population, were completing initial autism evaluation and specialist appointments at its multidisciplinary autism clinic.

Objectives: We designed and implemented a process improvement quality project to improve access to autism evaluations and specialty care for patients from the CHCs. Our objective was to increase the new pediatric patient appointment completion from below 40% to at least 70% for patients from two CHCs.

Methods: Using root cause analysis we determined two aims: 1) simplify the intake process at the autism clinic, ultimately allowing CHC physicians to submit a direct referral with brief clinical information without requiring the patient's family to complete a lengthy intake form 2) develop a community health worker role specializing in autism spectrum disorders (ASD-CHW) to assist families in navigating the health system. Pediatricians at the CHCs could refer their patients for ASD-CHW support at any time during the process of obtaining an appointment. Progress toward appointment completion was tracked for new patient referrals placed by primary care pediatricians at the two CHCs to the autism clinic between July 1, 2019, and June 30, 2024. An extrapolated appointment completion rate was calculated pre-project and for each six-month project period based on percent intakes received, percent received intakes with scheduled appointments, and percent scheduled appointments completed.

Results: We tracked outcomes for 312 referrals for 301 children from the two CHCs. Mean (SD) age at referral was 4.4 (3.1) years, 202 (65%) of referrals were for the autism diagnostic clinic (children <6yo), and 110 (35%) referrals were for diagnostic evaluation of older patients or specialty care. Patients with race (76%) and ethnicity (84%) identified in their medical records were most commonly identified as other race (38%), White race (38%), Black race (17%), and Hispanic ethnicity (59%). Of 300 with preferred language identified 165 (55%) preferred English, 106 (35%) preferred Spanish, and 29 (10%) preferred another language. Number of referrals increased on average over the course of the project, and more than half of new referrals were referred concurrently for ASD-CHW support by the third year (Figure). The project met its 70% appointment completion rate target for five of six six-month project periods. Appointment completion rate with ASD-CHW support was greater or equal to rate without ASD-CHW support for all six-month project periods (Figure).

Conclusions: A simplified referral process and community health worker support improved access to autism evaluation and multidisciplinary care for a diverse pediatric patient population. Referrals from the CHCs to the autism clinic increased during the project, and appointment completion rate exceeded the target of 70% for the majority of the project.



406.333 The Cascades Program: A School-Clinic Partnership Addressing Barriers to Autism Assessment Among Underserved Youth
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Background: Autism spectrum disorder (ASD) is a high-incidence neurodevelopmental condition that affects 1 in 36 school-aged youth in the United States. For youth of color and those from low-income and/or immigrant family backgrounds (hereinafter referred to as “underserved youth”), disparity in timely identification and diagnosis of ASD is evident compared to non-Latine/non-Hispanic White youth and those from higher socioeconomic status background. Barriers to a medical diagnostic evaluation for underserved youth suspected of ASD include: a) limited access to community clinicians due to low rate of Medicaid reimbursement, b) barriers to get to the hospital or clinic for in-person appointments, and c) prolonged wait time for a diagnostic evaluation appointment with little support available for families to effectively self-advocate and navigate the complex medical system. Altogether, these barriers underscore the need for alternative and equitable pathways for underserved youth to access ASD diagnostic evaluation.

Objectives: The Collaborative Autism School Assessment and Development Efforts (CASCADES) program addresses these disparities by creating a school-clinic collaborative model for ASD diagnostic evaluation. The goals of the CASCADES program are: 1) to enhance community capacity to provide comprehensive ASD diagnostic evaluations within schools; 2) to provide an alternative pathway for underserved youth to access comprehensive diagnostic evaluation and medical diagnosis of ASD, as appropriate; and 3) to promote a sustainable collaborative school-clinic model of care for underserved youth suspected of ASD in their local community.

Methods: The CASCADES program was implemented across four local education administrations (LEAs) in the Pacific Northwest between the 2022 and 2024 academic year. Clinical psychologists from a pediatric hospital partnered with school-based providers (e.g., school psychologists, speech language pathologists) to provide comprehensive evidence-based diagnostic evaluation for underserved youth suspected of ASD. Using data obtained across a two-year span, this proof-of-concept study evaluated the acceptability, engagement, and initial outcome of the CASCADES program.

Results: Evidence of the successful rollout of the CASCADES program include the training of 35 school-based providers, with a 71% retention rate by the end of the 2023-2024 academic year. Discontinuation among 10 providers was attributed to retirement, job relocation, and shifting district priorities toward intervention services. Additionally, 116 underserved youth completed comprehensive ASD evaluation, with a 73% increase in evaluations from Year 1 (n=49 in 2022-2023) to Year 2 (n=67 in 2023-2024). Projections indicate an approximately 61% increase in evaluation capacity with fully trained school teams, based on an estimated case rate of 4 to 6 evaluations per month. With regards to the acceptability and sustainability of the CASCADES program, all four LEAs independently introduced incentives to encourage school-based provider participation, such as protected time for team meetings and evaluations, and FTE allocations for ASD evaluations and team collaborations.

Conclusions: The CASCADES program demonstrates that school-clinic collaboration can address disparities in ASD diagnostic access for underserved youth. The program's success, evidenced by increased productivity, high retention, and independent adoption of incentives by LEAs, highlights its potential as a sustainable and scalable model. Future research will explore long-term outcomes and refine the program for broader implementation.

406.334 The Intersection of Autism and Gender Diversity in the Canadian Clinical Context: Characterizing a Sample of Adults Referred to Canada's Largest Publicly-Funded Adult Gender-Care Service

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Background: Recent research shows high rates of co-occurrence of transgender and gender-diverse (TGD) identities and autism. Autism and TGD identities are each associated with increased rates of mental health difficulties. Adults with intersecting autism-TGD identities can have unique mental health needs exacerbated by multiple minority stress, and experience substantial barriers to accessing mental health services. Few studies have focused on this intersection in the Canadian context, and no studies thus far have focused on individuals seeking clinical care in Canada. This study investigates the characteristics of a sample of adults referred to gender-related clinical care services at the Centre for Addiction and Mental Health (CAMH), a large, tertiary mental health hospital in Toronto, Canada.

Objectives: To characterize the clinical profile of adults referred to the Adult Gender Identity Clinic (GIC) at CAMH, especially regarding the prevalence rates of autism and clinical characteristics between those with and without an autism diagnosis.

Methods: Demographic and clinical characteristics were extracted from the electronic medical records of 1195 adults (aged 18+) referred to the GIC between January 2020 and March 2023. Descriptive statistics were calculated. An independent samples *t*-test examined differences in age between autism and comparison groups. A chi-square test identified differences in sex-assigned-at-birth frequency between groups. A chi-square test assessed differences in gender dysphoria diagnosis frequency between groups. Months of intake were split into three-month intervals, and cross-tabulation and chi-square tests identified differences in frequency of adults with autism diagnoses referred to the clinic at each time-interval. **Results:** See Table 1 for demographic information. Frequency calculations indicated that 3.8% of individuals in the sample had received a clinical diagnosis of autism. The comparison group was significantly older than the autistic group, $t(55.6)=3.37, p=0.001$. There was no difference between the autistic and comparison groups in sex-assigned-at-birth, $\chi^2(3, N=1191)=0.01, p=0.988$. There was no difference in the prevalence of gender dysphoria diagnosis between the autistic and comparison groups, $\chi^2(1, N=1191)=1.07, p=0.300$. Cross-tabulation for autism diagnosis prevalence within each of the three-month windows is shown in Table 2. Results of the three-month test revealed overall significant differences in prevalence rates between the time-windows, $\chi^2(12, N=1195)=25.12, p=0.01$.

Conclusions: This study provides a starting point in characterizing autism and gender-diversity in adults in Canadian clinical contexts. The higher rate of autism diagnoses in this referred sample (3.8%) compared with the general Canadian population rate (~1%) emphasizes the importance of neuroaffirmative approaches to gender-related clinical care. Measuring autism solely based on categorical diagnoses prior to entering the gender-care clinic was a limitation, as it did not account for potential underdiagnosis of minoritized groups and those who received a diagnosis following being seen by the GIC. With disparities in accessing care experienced by autistic TGD people in mind, better characterizing those who currently have access to gender-related clinical care versus those without can inform future research and service quality improvement on reducing care barriers.

**406.335** Court and Tribunal Proceedings Involving Autistic Adults in England and Wales: Autistic Community and Justice System Professionals' Perspectives

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Background: There is little empirical research on autistic individuals' experience of participating in court and tribunal proceedings in the Justice System. Even less is known about the impact and effectiveness of 'Special Measures' (a series of provisions in England and Wales that help vulnerable witnesses give their best evidence in court and help to relieve some of the stress associated with giving evidence) and other reasonable adjustments for autistic individuals in court and tribunal settings.

Objectives: 1. To explore the experiences of autistic people, those who support them (e.g., family, friends, carers) and justice system professionals in relation to participating in court and tribunal settings. 2. To examine how the presence (and absence) of Special Measures and other adaptations contribute to autistic people's experience of giving evidence in these justice settings.

Methods: Using qualitative surveys and semi-structured interviews, we examined the perspectives of autistic community members and justice system professionals regarding court and tribunal proceedings involving autistic adults. We recruited a total of 113 participants: (i) 67 autistic adults who participated in court and/or tribunal proceedings; (ii) 11 family members, friends, and/or carers who supported an autistic person through these processes and (iii) 35 justice system professionals who have worked with autistic people in these settings. Analysis of qualitative survey and interview data was conducted using reflexive thematic analysis.

Results: Many of the autistic people who took part in the study experienced significant challenges when participating in court and/or tribunal proceedings. Such proceedings were often described as highly emotionally demanding, prior to, during, and after court and tribunal hearings. The physical and social environments of justice system settings, as well as giving evidence, were frequently described as overwhelming; intersecting issues including sensory sensitivity, social-cognition, and communication. Participants described the disadvantage of unfamiliarity with justice system processes, language, and environments - heightened in cases where an autistic individual has no or limited legal representation and/or support. Participants (across groups) who had experience with Special Measures and other adaptations broadly believed these to be beneficial for many autistic people. For example, adaptations to the phrasing of questions, giving evidence remotely (or via live link) or using pre-recorded evidence were viewed as crucial enablers to giving evidence. However, the application of such adaptations can be impacted by a range of factors, from autism disclosure to practical implementation (such as technical difficulties). In criminal courts, some participants also expressed concerns about the potential distancing effects upon jurors when a witness/complainant is giving evidence remotely or pre-recorded evidence is used. There was broad agreement amongst participants that greater understanding of autism in the justice system is needed, as well effective autism training for professionals working within it.

Conclusions: Our findings indicate that many autistic people would benefit from support and/or adaptations prior to, during, and after court and tribunal proceedings. Given that participating in court and tribunal proceedings present often profound emotional, social-cognitive, communication and sensory challenges, many autistic people may be at risk of disadvantage when such support is absent.

406.336 Autism in Court: Simulated Criminal Court Proceedings with Autistic Adults, Justice Professionals and Mock Jurors.

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Background: Little is known about autistic peoples' experiences of giving evidence in criminal courts, and even less so how 'Special Measures' (SMs) impact these experiences. SMs are a series of provisions aimed at supporting vulnerable people to give evidence in court proceedings in England and Wales, including adaptations such as a witness being able to give their evidence remotely via video link and the use of a registered intermediary (forensic communication specialist) to facilitate communication during questioning.

Objectives: The objectives of this study were to gain insight into autistic people's experience of providing evidence as mock witnesses in simulated criminal court proceedings; the impact of the presence (and absence) of SMs; and how autistic mock witnesses are perceived during such proceedings. We examined these issues from a range of perspectives: autistic mock witnesses; barristers; judges; intermediaries; and mock jurors.

Methods: We simulated the experience of giving witness evidence in a criminal case, in a realistic replica criminal court. Across a series of eight mock hearings, autistic adult mock witness participants (n = 8; 1 in each trial) provided evidence about a previous, live mock crime under examination by real-life, qualified, and experienced barristers (n = 7; seven barristers each participated in one trial and one barrister completed two trials). Proceedings were overseen by a retired judge (n = 3; two judges each completed two trials, and one judge completed four trials), observed by separate cohorts of mock juror participants (n = 99; average 12 jurors per trial). Half of the autistic mock witnesses (n = 4) gave evidence with the assistance of SMs (such as giving evidence remotely via video link) alongside individually tailored recommendations from intermediaries (n = 3; two intermediaries participated in one trial, and one intermediary in two trials). The remaining four autistic mock witnesses gave evidence without SMs. Qualitative data was collected from all participant groups in each trial using a range of written feedback, interview and focus group methods

Results: Autistic mock witnesses, barristers, judges, and intermediaries took part in researcher-led semi-structured interviews immediately after their mock hearing. To elicit further reflections on their experience, autistic mock witnesses also took part in later follow up video-elicitation interviews, where they viewed audio-video footage of when they gave evidence and reflected on their experiences. During and after the mock hearings, jurors completed written feedback forms (about their perceptions of the witness) and then participated in juror cohort focus groups. Reflexive thematic analysis of the dataset is currently being conducted by the research team. Findings will be ready by December and presented at INSAR 2025.

Conclusions: Participating in the Criminal Justice System presents a complex set of emotional, social-cognitive, communication and sensory demands for many autistic people, with adaptations potentially required for when they give evidence. From a range of key perspectives, this study will provide unique insights into how autistic people experience giving evidence in realistic mock criminal court hearings, the impact of SMs, and how they are perceived by jurors and legal professionals.

Poster Session

408 - Adult Outcome: Medical, Cognitive, Behavioral I

May 1st, 2025, 5:30 PM - 6:30 PM - Hall 4A

408.001 Perceptual Experiences of Autistic People with an Intellectual Disability and People with Williams Syndrome

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Background: Autistic people without intellectual disabilities have increased perceptual capacity: they can process more information at any given time compared to non-autistic people (Remington et al., 2009, 2012). Having an increased perceptual capacity can explain both positive and negative aspects of the autistic experience. For example, better performance on visual search tasks (e.g. Joseph et al 2009) yet increased distractibility and sensory overwhelm (Lewis & Stevens, 2023). Although, there is evidence for increased perceptual capacity in autism from both qualitative (Irvine et al., 2023) and quantitative studies (Remington et al., 2012), to this date studies have been limited to cognitively-able participants. Here, we examined first-hand accounts of perceptual experiences of a group of autistic people with intellectual disabilities, and a group of people with Williams Syndrome (WS). WS is a rare chromosomal disorder due to a deletion on chromosome 7. Like many autistic people, those with WS often experience sensory processing differences and an intolerance of uncertainty (Glod et al., 2019).

Objectives: We aimed to establish whether increased perceptual capacity is universal across the autistic spectrum (i.e. for autistic people both with and without intellectual disabilities) and whether it is specific to autism, or also experienced by people with Williams Syndrome (WS).

Methods: We adopted a participatory approach to investigate this issue: via advisors with intellectual impairment (both autistic and those with WS) and a neurodiverse research team. Five autistic adults with intellectual disabilities and five adults with WS (mean age of 30.8 years) took part in accessible, qualitative interviews together with a Trusted Adult. Prior to taking part all participants completed a research passport that assessed likes, dislikes, and daily routines. We conducted interviews using personalised questions based on answers provided in the research passport. All interviews were transcribed and analysed using reflexive thematic analysis (Braun & Clarke, 2022).

Results: Both groups expressed enjoyment of focussed attention, with autistic participants preferring multiple simultaneous inputs. Responses suggested increased perceptual capacity for autistic participants only. The sensory environment was reported to be anxiety-inducing for both groups and participants shared ways in which they actively managed the sensory environment.

Conclusions: This study gives preliminary evidence that increased perceptual capacity may be universal across the autistic spectrum, and specific to autism. Understanding differences in capacity offers more targeted suggestions to support sensory challenges. This is crucial to support flourishing in schools and workplaces. This research project also uniquely enabled the voices of autistic people with intellectual disabilities and people with WS. People with intellectual disabilities are currently often marginalised and excluded from research, and without studies like this we risk neglecting a vulnerable subsection of the neurodivergent community

408.002 Self-Reported Strengths and Talents of Autistic Adults

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Background: Many adults express dissatisfaction with the diagnostic assessment process (Jones et al., 2014), and concerns have been cited regarding the lack of neurodiversity-affirming assessment methods (Harman et al., 2023). In part, this is due to instruments framing behaviors as symptoms causing impairment, overlooking the potential benefits that many autistic adults report associated with autistic features (e.g., DePape & Lindsay, 2016; Kapp et al., 2019; H. Lee et al., 2024; Russell et al., 2019). Systematically measuring autistic adults' strengths and talents during diagnostic assessment may improve satisfaction with the assessment process and inform diagnosis in a more neurodiversity-affirming manner. Historically, research has relied on caregiver-reported strengths (e.g., Howlin et al., 2009; Sabapathy et al., 2017; Warren et al., 2021; Wilkinson et al., 2022); more information on self-reported strengths is needed to inform instrument development and best assessment practices.

Objectives: To assess autistic adults' self-reported strengths and talents and examine overlap with questionnaires designed to evaluate strengths.

Methods: Participants included 127 legally-independent autistic adults recruited through SPARK Research Match (*Age*=35years, *SD*=10years; 51% female; 65% White; 50% diagnosed with autism in adulthood). Participants completed open-ended questions regarding strengths, along with questionnaires designed to capture various domains of strengths and difficulties (Table 1). Qualitative content analysis identified themes from the open-ended questionnaire. Differences in self-reported qualitative and quantitative strengths were examined by age of diagnosis (under 21 vs. over 21) and gender (male, female, and non-binary). Autistic team members collaborated on qualitative coding and data interpretation.

Results: Common themes emerging from the qualitative responses included cognitive/executive functioning (61%), character strengths (55%), creativity/artistic (52%), academic (33%), and interpersonal strengths (30%). Quantitative measures reflected strengths across categories related to creative achievement, character, self-determination, and autism-related strengths (Table 1). The number of qualitatively reported strengths did not differ by gender or age of diagnosis. Females and non-binary individuals reported more external recognition of talents in Visual Arts compared to males ($p=.0009$; Table 2). Non-binary individuals also reported greater recognition in Dance and Film compared to females and males ($p<.04$; Table 2).

Conclusions: Qualitative and quantitative data revealed a range of strengths and talents reported by autistic adults. Results from this study provide initial information on domains of strengths to examine in autistic adults, which will inform future research aimed at developing measures of strengths in this population. Notably, a range of strengths were reported that have not been highlighted in the extant literature, including advocacy, specific creative achievements, and interpersonal skills. Certain strengths endorsed by autistic adults may map onto DSM-5 diagnostic criteria for autism; for example, strengths related to communication and interpersonal skills may relate to DSM-5 A criteria, while sensory awareness, attention to detail, and repetitive work may be associated with DSM-5 B criteria. Given that autistic adults report both benefits and difficulties associated with autistic features (e.g., H. Lee et al., 2024), evaluating strengths associated with DSM-5 criteria, in addition to challenges, may inform diagnosis in a more neurodiversity-affirming manner. Gaps in existing measures and opportunities for measure development will be discussed.



408.003 Supports and Accommodations for Autistic College Students: A Self-Reported Study

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Background: Approximately 1 in 36 people are diagnosed with autism spectrum disorder (ASD) (CDC, 2023), but only 30 to 40 percent of autistic individuals have a co-occurring intellectual disability (Maenner et al., 2023). Given the majority of autistic individuals with average intelligence and the continuous increase in prevalence rates of autism, there are more autistic students entering higher education. Of those who decide to attend higher education, only about 38% graduate (Sanford et al., 2011). There is a significant lack of research on the autistic college student experience, specifically from the perspective of the autistic students.

Objectives: The purpose of this study is to gain insight from autistic college students about their college experience, by asking them directly, to identify challenges autistic students face in higher education, and to identify the supports and accommodations that are beneficial to autistic college students' success. The long-term goal is to further research on how to promote success in neurodivergent students in higher education.

Methods: Twenty-five autistic college students completed an eighteen-question Qualtrics survey that asked questions related to academic/social supports, accommodations, campus environment, self-advocacy, social participation, executive functioning, and sensory processing. Participants were 18 years or older, currently enrolled in a higher education institution, and had a formal diagnosis or self-diagnosis of autism spectrum disorder. Self-diagnosis was allowed, as many autistic college students have historically missed getting a diagnosis younger because of age-appropriate language and intellectual abilities, and autistic adult diagnosis is difficult/expensive to access. Participants were recruited through social media platforms (e.g., Facebook, Reddit), organization websites, and autism-specific college programs. Data was collected using Qualtrics, an online survey platform, and analyzed using descriptive statistics, as well as qualitative methods to analyze open-ended questions.

Results: The majority of autistic students rated the following accommodations as "helpful" or "very helpful": extended time on tests, video/audio recordings of lectures, notetaker, housing accommodations, flexibility for absences. They rated the following supports as "helpful" or "very helpful": professors, parents, friends, academic advisors, disability support services. Students identified the following challenges: completing assignments on time, staying organized, planning assignments, handling heavy coursework, understanding class expectations. A majority of participants felt they had to make a choice between being successful academically or being social, felt lonely, and felt their school could be doing more to make autistic students feel included on campus. Additionally, a majority of participants did not feel comfortable disclosing their autism diagnosis to their peers and did not feel like their peers understood autism.

Conclusions: There are several identified supports and accommodations that help autistic students through college, but also many barriers and challenges that prevent autistic students from being successful. More self-reported studies need to be conducted to continue to learn about how higher education institutions can help support their neurodiverse students both academically and socially.

408.004 Cognitive Abilities of Autistic Adults and Intellectual Disability in Relation to Age: Accelerated Development, Stable Progression, or Continued Age-Related Trajectories?

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Background: Research on long-term cognitive trajectories in autistic adults with intellectual disability (ID) remains limited, and their specific aging patterns are not well understood. This cross-sectional study examines cognitive changes from young to late adulthood, drawing on three neurocognitive disorder models: Accelerated Aging, Stable, and Continuous Trajectories. While cognitive stability is typical in the general population until decline begins at ages 50-60, individuals with ID tend to show continuous improvement in both verbal and non-verbal abilities until middle age (40-50), followed by stability, in line with the Compensation Age Theory. This study explores whether similar or distinct patterns emerge in autistic adults with ID.

Objectives: To assess age-related trajectories of nonverbal cognitive ability, receptive and expressive language, and adaptive behavior in three age cohorts of autistic adults with ID, in relation to the above three models of cognitive change with age.

Methods: Seventy-eight participants (24 females), aged 25.9 to 63.3 years ($M=41.95/SD=9.91$), previously diagnosed with autism based on their medical records, and currently residing and working in sheltered environments for autistic adults with high support needs, were enrolled in the study. All participants were assessed for adaptive skills using the Vineland Adaptive Behavior Scales (VABS) and for autism trait intensity with the Social Responsiveness Scale. They were divided into three age groups (25-35, 35-45, and 45+), which were equivalent in autism trait intensity. Nonverbal reasoning ability was evaluated using the Test of Nonverbal Intelligence (TONI), while verbal intelligence was assessed through the SHEMESH naming skills test and the Peabody Picture Vocabulary Test for language comprehension.

Results: Since the distribution of test scores deviated significantly from normality, non-parametric analyses were conducted. Kruskal-Wallis tests revealed significant differences between age groups for TONI ($p < .001$), PPVT ($p = .045$), and VABS ($p = .023$) scores, but not for SHEMESH scores ($p = .074$). Additional Mann-Whitney tests examining differences between the two groups indicated that TONI scores were significantly higher in the 35-45 cohort compared to the 25-35 cohort ($p < .001$) and remained stable in the 45+ cohort ($p = .498$). The 45+ cohort scored significantly lower on the PPVT compared to the 35-45 cohort ($p = .016$). Although SHEMESH scores did not differ overall, significant declines were observed in the 45+ cohort compared to the 35-45 cohort ($p = .036$). VABS scores also declined significantly in the 45+ cohort compared to the 35-45 cohort ($p = .009$).

Conclusions: The cognitive profile of participants revealed divergent age-related patterns: verbal test scores declined in late adulthood, while nonverbal test scores improved in young adulthood and remained stable in late adulthood. These findings suggest a decline in verbal abilities and an increase followed by stability in nonverbal abilities in late adulthood, consistent with the Continuous Trajectory Model for verbal decline and the Compensation Age Theory for nonverbal improvement. However, since only the TONI assessed nonverbal ability, these findings should be interpreted with caution. The overall findings suggest distinct cognitive aging trajectories, which could be crucial for developing targeted interventions aimed at enhancing functioning in older adults.

408.005 Psychological Needs, Autonomous Work Motivation, and Job Satisfaction: A Moderated Mediation Analysis in Autistic and Non-Autistic Employees

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Background: Self-Determination Theory (SDT) of motivation has been widely substantiated as a useful framework for understanding and promoting employment integration of adults in the general population. SDT theorizes that: (a) all employees share the aspiration to satisfy three work-related psychological needs: autonomy, social-relatedness and competence. Satisfaction of these needs promotes Autonomous Work Motivation (AWM) and its positive outcomes (b) AWM which is driven by choice leads to positive employment outcomes such as job satisfaction (Gagné & Deci, 2005). Recent research supported SDT's utility in addressing both personal and environmental factors affecting work motivation in autistic adults (Goldfarb et al., 2022, 2023).

Objectives: (1.) To examine an SDT-based theoretical model in autistic (AUT) vs. Non-Autistic (NA) employees, hypothesizing that satisfaction of the work-related psychological needs will lead to higher AWM, which will in turn lead to increased job satisfaction. (2.) To examine if this model is moderated by diagnosis, i.e. if the effects differ between autistic and non-autistic employees (Figure 1).

Methods: Data was collected from a sample of 44 autistic (6 females, aged 19-53), and 45 NA (11 females, aged 18-54) employees who completed a cross-sectional survey. Self-reports included the Basic Psychological Need Satisfaction-Work domain; the Multidimensional-Work-Motivation Scale (Relative Autonomy Index); and the Minnesota Job Satisfaction Questionnaire. A moderated mediation analysis using PROCESS for SPSS (Model 8) was computed, predicting job satisfaction by each of the three work-related psychological needs, with AWM as the mediator, and group (Autistic/NA) as the moderator, controlling for age.

Results: The predictive model for *relatedness* explained 42.4% of the variance in job satisfaction ($R = 0.65$, $F(5, 83) = 12.21$, $p < 0.001$). The direct effect was significant in both groups, but stronger for the NA group. The mediation effect was moderated by group and significant only for the autistic group. For *autonomy*, the model explained 33.2% of the variance ($R = 0.58$, $F(5, 83) = 8.25$, $p < 0.001$). A direct effect was significant in both groups, but stronger for the NA group. No significant indirect effects were found. For *competence*, the model explained 26.1% of the variance ($R = 0.51$, $F(5, 83) = 5.87$, $p < 0.001$). The direct effect was moderated by group, and significant only for the NA group. The mediation effect was moderated by group and significant only for the autistic group. Results are presented in Table 1.

Conclusions: Findings confirm that the satisfaction of work-related psychological needs is essential for job satisfaction, with notable differences between autistic and non-autistic employees. Non-autistic employees showed stronger direct effects, while autistic employees exhibited significant indirect effects via autonomous work motivation, particularly for relatedness and competence. These results suggest that understanding and promoting AWM may be especially beneficial for autistic employees, highlighting the importance of personalized approaches to workplace motivation and satisfaction for neurodiverse populations.



408.006 A Home That Meets the Needs of Autistic Adults: What Factors in the Living Environment Should be Considered?

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Background: Housing has been identified as a priority by autistic people in Canada and elsewhere in the world. The challenge is considerable, given the lack of available environments adapted to the needs of autistic adults and the lack of knowledge that takes into account the plurality of needs of this population. So far, studies have focused on the built environment and mainly in the context of group homes, with limited understanding of the needs of autistic adults living independently. Most studies have relied on questionnaires and have treated built and social environments separately, without considering the intersection of all environmental factors.

Objectives: This study aims to capture first-person perspectives of autistic adults on: 1) what constitutes an optimal living environment, including both the built and the social environment aspects; 2) how these aspects intersect together. Grounded in a transdisciplinary perspective, this project involves researchers with complementary expertise (architecture, design, social sciences, medical sciences) alongside autistic collaborators.

Methods: Interviews were conducted with 42 verbal autistic adults (21-60 years; 58% woman, 35% men, 7% other gender identity) from diverse living situations, to seek their views on what constitutes a home that would meet their needs. The inclusive interview process allowed for various communication methods, pre-sent questions, visual aids, and opportunities to provide additional input up to 7 days after the interview. Interviews focussed on 5 main domains: 1) appreciation of the current living environment, 2) the ideal home, 3) challenges and obstacles, 4) individual strengths and facilitators and 5) neighborhood. A thematic qualitative content analysis was conducted using a person-environment fit model. Coding was performed using NVivo software by two members of the research team and discrepancies were resolved by mutual agreement.

Results: The intersection of individual factors (eg. sensory perception) with the built and social environments led to 3 key themes encompassing 10 components for designing homes adapted to the needs of autistic adults: 1) access to adapted living spaces (a. sensory comfort, b. diverse communication options, c. places that are easy to understand and find one's way around, d. access to support and professional services, e. proximity to nature and green spaces); 2) the possibility of making choices (a. increased power to act, b. access to a greater diversity of housing models, c. access to safe, salubrious and affordable housing); 3) sense of community belonging (a. supportive social environment, b. opportunities to meet others).

Conclusions: This study highlights what autistic adults consider to be important for their wellbeing in the context of housing, showing how physical and social components intersect together. It underlines the importance of conceiving housing options and supports that foster self-determination and social inclusion. It is possible as well as imperative to consider autistic individuals' views and experiences for designing home *with* and *for* autistic adults. The findings provide decision-makers with solutions for creating living spaces where each autistic individual can feel safe and flourish.

408.007 A Longitudinal Study of Aggression in People with Autism and Other Neurodevelopmental Disabilities

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Background:

Aggression is prevalent in autism spectrum disorder (ASD) and other neurodevelopmental disabilities (NDDs), yet longitudinal research tracking aggression over time is lacking. Most existing studies on aggression focus on childhood and use parent-reported, cross-sectional data, underscoring the need for multi-method assessments of aggression beyond childhood. Certain factors are known to correlate with aggression, including fewer adaptive skills, sensory difficulties, self-injury, ADHD symptomatology, and restricted and repetitive behaviors (RRBs).

Objectives:

(1) to characterize rates of aggression at various developmental time points (toddlerhood: age 2; school-age: age 9; and emerging adulthood: age 18) using a composite score based on clinician observation, clinical interview, and parent-reported questionnaire; (2) determine patterns of changes in aggression over time; (3) identify factors related to various trajectories of aggression over time; and (4) examine whether the presence of early aggression is predictive of aggression later in life.

Methods:

This study leverages data from 254 participants, recruited from North Carolina, Illinois, and Michigan. Participants with a range of cognitive abilities are included: 39.9% were classified as more-cognitively-abled (MCA; IQ ≥ 70) and 60.1% were classified as less-cognitively-abled (LCA; IQ < 70). Scores on the E2 code of the Autism Diagnostic Observation Schedule (ADOS), items 81 and 82 on the Autism Diagnostic Interview—Revised (ADI-R), and the Aggression Subscale on the Child Behavior Checklist (CBCL), generated a binary *Aggression Composite* score for each time point (age 2, 9, and 18). One-way ANOVAs examined factors related to aggression, both within and across time points (Table 1). Logistic regression analyses determined the extent to which early aggression predicted later aggression, controlling for cognitive ability and autism symptoms severity.

Results:

Fifty-four percent, 69%, and 42% of the full sample showed aggression in toddlerhood, school age, and emerging adulthood, respectively. LCA individuals had higher rates of aggression in school age (80%) and emerging adulthood (58%) compared to MCA individuals (48% and 22%, respectively).

Longitudinal aggression profiles, derived from *Aggression Composite* scores, provide insight about aggression prevalence, change in aggression over time, and early aggression predicting later aggression. A total of six profiles emerged: *Absent*, *Late Decreasing*, *Early Decreasing*, *Persistent*, *Increasing*, and *Transient* (Table 1).

Across ages 2, 9, and 18, distinct patterns of change were found: 31% displayed persistent aggression, 25% increased, 23% decreased, and 13% never displayed aggression. Higher autism symptoms, lower verbal IQ (VIQ), nonverbal IQ (NVIQ), and fewer adaptive skills correlated with more aggression cross-sectionally. Nonverbal IQ and RRBs related to aggression longitudinally, such that people in *Decreasing* or *Absent* profiles had higher NVIQ and fewer RRBs than those with *Persistent* or *Increasing* profiles. Finally, participants with aggression at 9 were almost four times likelier to exhibit aggression at 18.

Conclusions:

Aggression is common in autism and NDDs, peaking around age 9, and declining in emerging adulthood. Patterns of change varied widely in our sample, with evidence that higher NVIQ and fewer RRBs may be protective. Findings have implications for clinical practices, highlighting important developmental periods and high-risk subgroups.



408.008 Leadership Perception and Development in Autistic Individuals**Z. Myszko, J. Bragger and L. Lakusta, Psychology, Montclair State University, Montclair, NJ**

Background: Unemployment and underemployment rates within the autistic population are high, even though many have attained education and have characteristics that qualify them for advanced positions (Lorenz & Heinitz, 2014; Chen et al., 2015). While there are negative stereotypes about autistic individuals in the workplace and assumptions that they would not make good leaders (Praslova, 2021), there are currently autistic individuals in leadership roles (Williams et al., 2024), and little research has investigated how they understand leadership and what kind of leaders they are. Further, research has shown that servant leadership (SL) may be an effective leadership style (Banks et al., 2018; Hoch et al., 2018), leading to the inclusion of SL principals and developmental experiences in some training programs. However, no research has investigated what leadership styles autistic leaders practice and whether SL will benefit autistic leaders within their organizations. If common leadership training programs focus on developing a certain type of leader based on neurotypical strengths, this training may not be useful to – and may even be detrimental for – the autistic population.

Objectives: Determining whether autistic individuals can discern leadership behaviors and the types of leadership behaviors they are likely to practice will be instrumental in promoting inclusivity in the workplace, creating training programs that adapt to the needs of this population, and enabling upward mobility within organizations. These goals led to the questions: (1) How do autistic adults currently in leadership roles understand leadership? (2) Do autistic adults currently in leadership roles tend to identify as a certain type of leader? and (3) Does scoring higher with regard to particular characteristics on the Autism Spectrum Quotient (AQ) relate to the leadership styles of autistic leaders?

Methods: In this exploratory study, 34 autistic adults in leadership positions (11 women, 32.4%) completed an online survey that included a Match-to-Sample (MTS) task and two self-report questionnaires to assess leadership understanding, and eight leadership style self-report questionnaires.

Results: Using a one-sample t-test it was determined that participants were able to identify SL behaviors above and beyond chance on the MTS task, $t(32) = 8.19, p < .001$. Descriptives revealed that participants most often self-identified as servant leaders on the leadership style measures (Please see Table 1 for a complete list of descriptives). SL was negatively associated with difficulty imagining and positively correlated with attention to detail, difficulty with social skills, difficulty with switching attention, and overall AQ scores.

Conclusions: The results indicate that autistic leaders understand leadership implicitly and they may prefer to practice and develop as servant leaders. These findings are an important contribution to the leadership field and suggest that more autistic people should be in leadership positions. Autistic leaders are employed worldwide, and it is necessary to understand their perspectives on leadership in order to create a more accepting and accommodating workplace, as well as to facilitate their growth. Understanding more about how autistic leaders view leadership and their own leadership behaviors is the first step towards realizing these goals.

**408.009 A Qualitative Study and Evocative Auto-Ethnography of Intersectional Concordance in Research: Perspectives of Black Autistic Adults****A. Tolliver¹ and A. M. Davis², (1)Johns Hopkins University, Baltimore, MD, (2)Disability Health Research Center, Johns Hopkins School of Nursing, Baltimore, MD**

Background:

The field is nascent in understanding how intersectional concordance (i.e., Black and autistic) has an impact on the autistic person. Because minimal literature exists on this topic and multiply marginalized autistic adults are less involved in research it is important to better understand concordance bidirectionally.

Objectives:

This evocative auto-ethnography + qualitative analysis will expose the bidirectional viewpoints on interviewer/researcher- research participant concordance in the context of a qualitative interview on structural racism, structural ableism and intersectionality in Black autistic youth and young adults (n=10).

Methods:

Ten autistic adults, ages 18 to 35 took part in a qualitative interview focused on exploring experiences for Black autistic adults (e.g., healthcare, housing, education). These participants were interviewed by a Black autistic research assistant who disclosed at the start of the interview her intersectional identities. Participants could opt in to completing a follow-up concordance survey through Qualtrics and compensated with a \$10 e-gift card.

The open ended responses were based on the following inquiries:

1. Were there aspects of this interview resonated with you the most? Please describe.
2. How was the experience for you knowing that the interviewer was also someone on the autism spectrum?
3. How was the experience for you knowing that the interviewer was Black and also autistic?
4. What are your thoughts on having someone autistic be an interviewer of you in the future? How about Black and autistic (a researcher engaging you who has these identities)?
5. On a related topic, how would you feel about having a therapist or doctor who is also autistic?

Data will be analyzed through open coding, refining of codes, theme development and finalization iteratively to ensure final themes best reflect the participants' responses.

Results:

Results are forthcoming. All data collection will conclude by early December 2024 and analysis of data will conclude by March 2025. All findings will be prepared and ready for presenting at INSAR 2025. Results will be based on Evocative Autoethnography whereas the researcher reflecting on their own experiences, emotions, and personal narratives related to the research topic. The evocative aspect of autoethnography emphasizes personal storytelling, inviting the reader to engage emotionally. Cultural contextualization will also ensue, as while the focus is on the self, the researcher connects their personal stories to broader cultural, social, or political contexts. Combining evocative autoethnography with qualitative open-ended responses will offer a rich, dynamic approach to research that deepens both personal insight and collective understanding. Further through triangulation, the researcher's evocative autoethnography will provide a deep, personal lens, while qualitative open-ended responses from participants offer external validation or contrast. By comparing and contrasting the researcher's narrative with participant responses, the study becomes more robust and reflective of multiple viewpoints.

Conclusions:

This research will feature the perspectives of Black autistic adults who were interviewed by a Black autistic researcher along with an autoethnographic sharing of a Black autistic researcher. These findings will provide insights into the research experience of autistic people with concordant identities in a dynamic and insightful manner.

408.010 A Qualitative Study of the Experiences of Autistic Adults Taking Part in a Co-Produced Randomized Controlled Trial of Sertraline Vs. Placebo for Anxiety

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Background:

Randomized controlled trials (RCTs) provide gold-standard evidence for effective treatments. Study integrity and statistical power to answer the research question depends on participants not only agreeing to take part, but continuing until the end of the study. Poor participant experience can also lead to drop-out, contributing to mistrust in science, of particular importance within the autism community. Autism-specific factors such as difficulties processing uncertainty (a key feature of trials, e.g., blinding and randomization) mean that recruitment and retention issues are anticipated with this population. The STRATA RCT aimed to assess whether sertraline is an effective treatment for anxiety in autistic adults (placebo-controlled; blinded). The study was co-produced with an Autistic Advisory Group. Qualitative research in the form of 1:1 interviews was carried out to explore the decision making process of participants, and their experiences of the study and the intervention.

Objectives: To understand participants' motivations for i) deciding to take part, ii) continuing participation throughout the study, and iii) feedback on their experiences of trial communication and processes, including experiences of taking the study medication.

Methods:

Data from 63 interviews with STRATA study participants from all UK study sites were thematically analyzed. Participants and interviewers were blinded to treatment allocation.

Results:

Interviewees' average age was 36.35 years (range=19-70), with the majority being of White ethnicity (N=7 other). Findings showed that most reported altruistic motivations for participation, such as helping with autism and mental health research, as well as personal reasons, including receiving support with their own anxiety. Participants wished to complete 12 months in the study as they felt they had made a commitment to do so, and valued the importance of completeness of data collection to successful research. Placebo-control and blinding processes were well accepted, and some participants experienced benefits in terms of improvements to their own mental health whilst in the study. Feedback about trial processes and communication was largely positive, including praise for the communicative approach and care shown by the study teams, and an appreciation for flexibility (e.g., appointment times and meeting methods, as well as judgement-free rescheduling in case of missed appointments). However, some challenges were also noted, including experiences of medication side effects, and a few participants finding aspects of the standardized questionnaires difficult (e.g., responding about symptom frequency). However, some noted that the combination of the questionnaires with a study appointment helped them to provide context to how they were feeling.

Conclusions: Findings show that autistic adults wish to contribute to the evidence base regarding treatments for their mental health, and may be motivated to continue in the study to honor that commitment, as well as for reasons of scientific/personal curiosity. Concerns about blinding tended to be outweighed by these motivations. The results highlight that co-produced study design, including a focus on person-centered care can help to build a strong professional relationship between research staff and participants, contributing to successful recruitment and retention in RCTs with autistic people.

408.011 A Retrospective Chart Review of Late-Diagnosed Autistic People: Demographic and Clinical Variables

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Background: While autism is typically diagnosed in childhood, many people are not identified during this time and are instead diagnosed in adulthood. Some studies have reported increased mental and physical health challenges in those diagnosed in adulthood (see Huang et al., 2020 for a review), but this population is not well understood. Late diagnosis can follow misdiagnosis, and often indicates that proper accommodations are not provided in the developmental period. Additionally, late diagnosis is more prevalent among certain groups including women, gender diverse people, those of low socioeconomic status, and ethnically diverse peoples (Rutherford et al., 2016; Brugha et al, 2011).

Objectives: We present data from a retrospective chart review from the Adult Neurodevelopmental Services at the Centre for Addiction and Mental Health in Toronto, Canada. This clinic offers a publicly funded autism diagnostic service for any adult living in Ontario. The aim of this project is to characterize those given a diagnosis of autism in adulthood. We examine variables including sex and gender, employment status, previously diagnosed mental health conditions, co-occurring physical health conditions, and medication usage.

Methods: This chart review examined all adults diagnosed with autism at the hospital as part of the outpatient service in 2023 (n = 183). These assessments did not include those with intellectual disability. As this was a retrospective review, data was gathered by reviewing consultation notes in medical charts of assessments completed by psychiatrists and psychologists at the clinic. Information was also gathered from a self-reported health equity questionnaire completed at intake used by the hospital.

Results: Half of the autistic adults were between the ages of 18-29, while the next largest segment was the 30-39 group (28%). Sixty-two percent of the autistic adults were assigned female at birth, and 48% identified as a woman, 3% as genderfluid, 6% as transgender, and 14% as non-binary. Only 57% were in full-time employment or enrolled in a post-secondary program. Most (81%) had at least one co-occurring mental health condition and 58% had co-occurring medical conditions. Sixty-four percent were taking at least one medication.

Conclusions: Unlike samples of children diagnosed with autism, the autistic group in this sample were predominantly female (sex assigned at birth) and nearly one quarter were gender diverse. Compared with the population at large, the autistic people in this review had significantly higher rates of mental and physical health conditions. Other unique aspects of this population will be explored. This study highlights specific variables that may be linked with missed diagnosis in childhood (e.g., gender, diagnostic overshadowing, other demographic variables). Implications for the assessment, diagnosis, and outcomes of late-diagnosed autistic people will be discussed.

408.013 A Self-Directed Behavioral Executive Skills Program for Autistic Youth and Young Adults

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Background: Challenges with executive functioning (EF) skills are a barrier to wellbeing for autistic youth and adults (Wong et al., 2022). EF skills are a set of mental skills including mental manipulation of ideas, planning, preceptive taking, cognitive inhibition, and flexibility (Diamond, 2013). Wellbeing is the measure of a person's overall happiness, satisfaction, and positive outlook on life (Thompson-Hodgetts). Compass-Behavioral is a "coaching" program that utilizes behavioral principles to teach EF skills to autistic youth and adults (ages 12+) with the goal of improving wellbeing. Autistic individuals work directly with their Compass-Behavioral coach to set personal goals around FE skills that are important to their wellbeing.

Objectives: We conducted two studies to understand how a behavioral intervention that emphasizes self-determination in a person-centered framework could improve EF skills and wellbeing in autistic youth and young adults. Study 1 evaluated the effectiveness of Compass-Behavioral at improving wellbeing by improving specific EF skills (e.g., perspective taking). Study 2 compared the effectiveness of Compass-Behavioral to typically delivered tiered applied behavioral analysis (ABA) at improving wellbeing in autistic youth.

Methods: In Study 1, 376 autistic individuals (age range 11 to 26; mean age 16.08 years; 45.5% = female, 55% = male) participated in Compass-Behavioral. EF skills were measured pre-and post-participation with self-report measures for each EF skill (e.g., perception taking) plus sleep. Wellbeing was measured by the Catalight Youth or Adult Wellbeing Scales. To gather qualitative information, a post-program survey was completed. Study 2 compared wellbeing, goal attainment, and length of stay (LOS) in a sample of 60 autistic youth. Thirty youth ($M_{age} = 16$ years) received Compass-Behavioral, and 30 youth ($M_{age} = 14$ years) received ABA. Groups were matched on baseline adaptive abilities.

Results: In study 1, we found sleep and all EF skills (self-observation, self-advocacy, communicating socially, preceptive taking, self-management, understanding vulnerabilities) improved significantly. Wellbeing significantly improved ($p < .001$) Average personal goal attainment was 83%. Qualitative comments indicated high level of satisfaction ("Would highly recommend.") and usefulness of EF skills ("I understand my behaviors and other people's behaviors better.") Negative comments were uncommon and tended to focus on when to use skills ("I might use [skills] later but not now") or which EF skills to pick ("hard for me to tell which elements I should pick.") Dropout rate was low.

Study 2: Wellbeing scores increased in Compass-Behavioral participants but not for ABA participants. Compass-Behavioral participants achieved significantly more goals than ABA participants. Length of stay was significantly lower in the Compass-Behavioral group.

Conclusions: EF skills are a barrier to wellbeing for autistic youth and adults. Compass-Behavioral resulted in an improvement in EF skills, sleep and wellbeing for autistic youth and adults. Compared to ABA, Compass-Behavioral was more effective in improving wellbeing and goal attainment over a shorter length of time. Participants in Compass-Behavioral reported the program was effective and enjoyable. While additional research is needed to examine long-term benefits, Compass-Behavioral may be an option for autistic youth and adults seeking to improve EF and wellbeing.

408.014 Acceptability and Feasibility of a Primary Care Health Check for Autistic Adults in England: Evaluation Findings from Questionnaires and Interviews

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Background: Autistic people commonly have physical and mental health conditions and frequently experience barriers to accessing healthcare, contributing to problems identifying and treating health conditions. These factors may lead to increased and earlier morbidity, and lower average life expectancy. Health checks specifically designed for autistic people, incorporating a pre-appointment questionnaire and adjustments to healthcare, may help overcome these barriers and reduce health inequalities.

Objectives: This study reports the acceptability and feasibility of a primary care health check for autistic adults living in England, delivered as part of a Randomised Controlled Trial (RCT).

Methods: Practices were randomly allocated to deliver health checks, or treatment as usual; the RCT primary outcome is unmet health needs identified and met. Autistic adults, carers/supporters, and primary care clinicians who received or participated in health checks completed evaluation questionnaires for each health check. A purposive sample was selected for semi-structured interviews to gain deeper insights into their experiences. Non-clinical primary care staff were also invited for interview. Questionnaire data was analysed using descriptive statistics and Fisher's exact tests to explore subgroup differences. Thematic analysis was undertaken with interview transcripts.

Results: 95 health checks were completed. Evaluation questionnaires were received from 81 autistic adults, 11 carers/supporters, and 71 questionnaires from 18 clinicians delivering the health check. Most autistic adults found the health check pre-appointment questionnaire acceptable to use and helpful preparation for the appointment. Reasonable adjustments for the appointment were requested by 32% of autistic people; nearly all found them beneficial. Twenty-five (31%) autistic adults reported they took a carer/supporter to the appointment. Carers/supporters helped with overcoming barriers (e.g. supporting communication, reducing anxiety). Clinicians' responses indicated the health check process was feasible to deliver, with most (85%) creating a Health Action Plan during the appointment to summarise the identified needs and subsequent actions. For autistic adults, comparative analysis showed no significant differences across all subgroups (e.g. age, number of health conditions). Participants with more health conditions were more likely to prefer annual health checks, while those with fewer conditions were more likely to prefer less frequent checks ($p=0.037$).

Interviews with 24 autistic adults, 5 carers/supporters, 11 clinicians and 4 non-clinical primary care staff revealed overarching themes around the practicality of delivering health checks, facilitators and barriers to delivery (individual characteristics, setting, role of carers/supporters), health check outcomes (intervention, advice, support, and reassurance) and barriers to future implementation (capacity, funding). Primary care staff emphasised the value of health checks in identifying support needed by autistic adults, although some noted challenges for future implementation, including appropriate funding, patient engagement, and current primary care capacity pressures. Some autistic people and clinicians noted the health check had identified new health and/or care needs.

The results of the RCT will be available in 2025 and presented, including the clinical and cost effectiveness of the health check.

Conclusions: Primary care health checks for autistic adults are acceptable and feasible for use in health care. Both autistic adults and healthcare professionals recognised the potential value of these checks in improving healthcare access and outcomes.

408.015 The Influence of Income, Disability, and Employment on Quality of Life and Health Outcomes in Older Autistic and Non-Autistic Adults

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Background: Autistic individuals frequently encounter barriers to securing and maintaining employment, which is crucial for health and well-being. Employment provides financial stability, yet most research on autistic individuals focuses on younger populations. Studies including older autistic adults often skew toward younger or middle-aged participants, with only about 1% aged 66 or older. Few autistic adults receive long-term services, compromising their economic stability and decreasing quality of life. However, a recent study found no significant link between employment and subjective quality of life in older adults, emphasizing the need to investigate this relationship further as autistic adults reach retirement age.

Objectives: In older autistic and non-autistic adults: (1) Identify disparities in income, public assistance, and health outcomes. (2) Explore how employment-related income, disability support, and learning disabilities correlate with quality of life (QoL) and overall health. (3) Characterize the relationship between overall health and quality of life.

Methods: The study included 29 older adults: 15 autistic ($M = 63.40$ years, $SD = 5.67$) and 14 non-autistic ($M = 62.50$ years, $SD = 4.32$), with a history of mental health concerns. Participants completed self-report measures of disability status (WHODAS), QoL (AASPIRE Adaptation of Single Item Global Quality of Life) income, psychiatric and learning disorder diagnoses and overall health. Adults also completed the WASI-II 2-subtest version (autistic mean $IQ = 106.47$, $SD = 15.05$; non-autistic mean $IQ = 108.55$, $SD = 17.00$). Independent samples t-tests identified group differences, and Pearson correlations examined relationships between variables.

Results: Older autistic adults reported that a smaller percentage of their income came from employment ($n = 15$, $M = .40$, $SD = .51$) compared to non-autistic adults ($n = 14$, $M = .77$, $SD = .43$) and were more likely to receive public assistance ($t(26) = -1.74$, $p < .001$). Self-reported total general disability scores on the WHODAS negatively correlated with overall quality of life ($r(19) = .57$, $p = .009$) and overall health ($r(18) = -.82$, $p < .001$). Self-reported sufficient income associated with higher quality of life ($r(19) = .44$, $p = .022$), whereas reliance on public assistance for income negatively associated with overall health ($r(27) = -.46$, $p = .014$). No relationship was found between employment status and quality of life or overall health. Furthermore, autistic individuals had significantly higher rates of learning disabilities ($t(28) = -2.18$, $p < .001$). Learning disabilities was positively correlated with public assistance for income ($r(28) = .52$, $p = .005$) and negatively correlated with work income ($r = -.47$, $p = .011$).

Conclusions: Our preliminary findings align with existing literature that employment income and disability status significantly influence the quality of life and overall health of older autistic adults, who face greater employment challenges and higher dependence on public assistance. Our findings add to growing literature on older autistic adults, suggesting the need for targeted supports. Future directions include increasing our autistic sample by Spring 2025 (target $N = 45$), exploring impacts of retirement, unemployment, and the COVID-19 pandemic on employment trends in this population.

408.016 Agency in Defining Autism: A Hierarchical Regression Analysis

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Background: Societal changes shape how autistic young adults define autism, influencing their identity development and psychosocial adaptation. The pathological model of autism appears to significantly conflict with the lived experiences of autistic individuals. Due to the inconsistency between societal definition of autism and personal experiences, autistic individuals may take different actions to address this incongruence. They may actively redefine the meaning of autism based on their personal experiences (agency) or passively define autism and conform to social norms (passivity). Agency has been identified as a significant predictor of well-being and other psychosocial outcomes. However, its role in the psychosocial adaptation process is rarely explored in autism literature.

Objectives: The study primarily aims to explore the role of agency and its effect on psychosocial outcomes (i.e., self-efficacy, quality of life (QOL)) among autistic young adults. Additionally, it also examines the effects of demographic covariates (i.e., gender, age, age of diagnosis) and self-acceptance in the psychosocial adaptation process of this population. The goal is to expand the understanding of human agency within autism literature and inform the development of effective services and programs.

Methods: 204 autistic youths aged 18 to 26 recruited from Prolific and Amazon Mechanical Turk (MTurk) completed an online survey consisting of instruments measuring target variables. To assess the strengths of the adjusted associations, hierarchical regression analyses (HRA) were performed between the covariates (i.e., three dichotomized gender variables for female, non-binary, and prefer to self-disclose with male as the reference group, age, age at diagnosis, self-acceptance), primary independent variables (i.e., agency and passivity), and the two dependent variables (i.e., self-efficacy, QOL).

Results: Findings indicated that gender and self-acceptance emerged as significant predictors of self-efficacy and QOL. Specifically, autistic young adults identifying as non-binary reported significantly lower self-efficacy and QOL compared to males. Also, higher levels of self-acceptance were significantly associated with improved self-efficacy and QOL. Additionally, agency in defining autism, where autistic young adults actively redefine their autism, significantly and positively affected both self-efficacy and QOL, even after controlling demographic covariates and self-acceptance.

Conclusions: Autistic young adults undergo a complex yet valuable journey in understanding and defining autism. Achieving positive psychosocial outcomes requires them to fully grasp their role in the relationship between self and autism. This study emphasizes the importance of agency in fostering self-efficacy and quality of life. Future research should delve deeper into how agency influences identity development and psychosocial adaptation. The findings of this study offer implications for service delivery to autistic young adults with multiple minority identities. Healthcare providers should receive training that equips them with the necessary knowledge about the experiences of autistic and gender minority individuals. Acceptance-based programs should move beyond encouraging passive acceptance of reality and society's definition of autism. Rather, they should incorporate components that empower autistic young adults to recognize their agency and active role in shaping their own lives, supporting them to develop their unique definition of autism that resonates with their personal experiences.

408.017 Aging and Life Stories of Brazilian Autistic Individuals: Results of a Pilot Interview

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Background: In Brazil, there is a shortage of qualitative studies on the experiences of autistic adults and older persons. Considering the rapid aging of the population in several countries around the world, it is essential to understand the reality experienced by autistic individuals to guide public policies aimed at healthy ageing. This work is part of the preliminary results of an ongoing master's research project at the University of Brasilia (UnB).

Objectives: The objective is to understand and analyze the needs of autistic adults over 45-year-old and autistic older persons in the aging process in Brazil's capital, Brasilia.

Methods: This is an exploratory qualitative study that was approved by the UnB Human Sciences Ethics Committee (CAAE 76855423.0.0000.5540). The chosen method is cartography. It focuses on life stories and uses photographs to help the participants' narratives. A 47-year-old autistic woman was recruited by convenience sampling (snowball) to validate the methodology and the semi-structured interview script. Three meetings were held in August 2023. The first meeting presented the research objectives. The second was the interview, which lasted 1 hour and 42 minutes and provided a space for listening and recording stories empathetically. The third meeting was the participant's feedback on the whole process. The interview was transcribed and analyzed using the thematic analysis method with the help of Atlas.ti software.

Results: Three important categories emerged from thematic analysis: (1) autism throughout life, (2) meaningful activities and (3) aging. In the first category, the participant reported a late diagnosis at the age of 45, after the autism diagnosis of two of her children. Her childhood shyness concealed social and communication difficulties, among other things that she didn't understand and couldn't cope with. The masking of feelings, socialization, and communication difficulties is a thread that runs through many of her experiences (see Figure 1). The masking mechanism is widely cited in scientific studies, and one of the strengths identified is that autistic women and girls compensate for the difficulties of autism with better cognitive flexibility. In the second category: the activity of writing, especially poems, is reported from a very young age as one of the ways of expressing the feeling of inadequacy experienced and little verbalized to the world (see figure 2). In the third category: the participant expressed concerns about the end of her life and caring for her children, should something happen to her. There was also a desire to fulfill dreams and develop personal projects (see figure 2).

Conclusions: The use of photographs contributed significantly to the participant's narrative and memory when telling her life story. The thematic categories revealed important perspectives for understanding some of the needs of autistic individuals. The pilot interview was essential for validating the methodology and refining the interview script. Thus, the master's research will move on to the next phase, seeking to map other stories of autistic individuals in an accessible way, using a script with simple language and ethical care, to respect individualities and different ways of being.



408.018 Alzheimer's Disease Genetic Risk Dosage in Autistic Individuals

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Background: Middle-aged and older autistic adults are 2.6 times more likely to be diagnosed with early onset Alzheimer's disease (AD) compared to non-autistic adults, however understanding cognitive and brain aging heterogeneity with autism is lacking. Genetics explain substantial variance in cognitive aging outcomes and incidence of neurodegenerative disease, but there are no genetically-informed studies of aging with autism. Polygenic risk scores (PRS) are an effective tool to measure an individual's genetic liability to complex traits, including predicting AD development. Lastly, due to historical malpractices concerning autism and genetics, we intend to use genomics to empower aging autistic adults by helping them better understand how aging may affect them.

Objectives: To explain heterogeneity cognitive and brain aging outcomes of autistic adults through genetic approaches, we aim to 1) Determine whether autistic individuals carry a higher cumulative genetic risk for AD compared to non-autistic individuals and 2) Determine if AD-PRS differentially moderates memory performance in autistic vs. non-autistic adults

Methods: One hundred and forty-seven (91 male) participants included 65 non-autistic and 82 autistic adults ages 18-70 (38.62 ± 16.75). Sex was defined as assigned at birth (concordant with all participants' gender identities). Participants scored >70 on the Kaufman Brief Intelligence Test-2, >25 on the Mini Mental State Exam, and autistic participants met criteria on the Autism Diagnostic Observation Schedule-2 and DSM-5. DNA was extracted from saliva using Oragene's DNA purification protocol and genotyped on the Illumina Global Diversity Array with an additional 180K neurodegenerative disease markers, then imputed for whole genome coverage through the TOPMed server. AD-PRS was generated from a Genome Wide Association Study (GWAS) of 71,880 AD and 383,378 controls using the PRSice-2 software. The Rey Auditory Verbal Learning Test and raw scores from the long-term delayed recall (A7; long-term memory) were used for analyses since this measure is sensitive to mild cognitive impairment that precedes AD. We performed an ANCOVA to test a diagnostic group difference in AD-PRS, controlling for sex, and the interaction between group and sex. Additionally, ANCOVA was used to test a diagnostic group difference in long-term memory (AVLT A7), controlling for sex, age, AD-PRS, and the interaction between group, sex, and AD-PRS.

Results: The autism group had a significantly larger AD-PRS ($p=0.035$), and significantly worse long-term memory scores ($p=0.017$) than non-autistic controls. The interaction between autism diagnosis and AD-PRS was significant and driven by a steeper negative slope in the autism group, indicating that cognitive function in autistic individuals is impacted more by AD-PRS than non-autistic individuals. Sex was not a significant predictor or moderator for AD-PRS or long-term memory scores.

Conclusions: This study was the first to investigate cumulative genetic risk for AD in autistic adults and found that autistic adults have a greater genetic risk in comparison to non-autistic adults. Synoptically, we found that the Alzheimer's PRS has a greater impact on cognitive function in autistic individuals compared to non-autistic individuals.



408.019 Knowledge, Perceptions, and Use of Psychedelics Among Autistic Adults: An Online Survey

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Background: Psychedelics have shown promise in treating mental health conditions (such as depression and post-traumatic stress disorder) in neurotypical populations. However, psychedelic therapeutic potential for individuals with autism spectrum condition (ASC) remains under-explored. Autistic individuals frequently experience co-occurring mental health challenges, yet are often excluded from clinical trials, creating a gap in understanding effective treatments for this population.

Objectives: This study aimed to explore the knowledge, perceptions, and experiences of autistic adults regarding psychedelics as a treatment option.

Methods: A cross-sectional online survey was conducted with English-speaking autistic adults. The survey assessed participants' knowledge of psychedelics, their willingness to use them for mental health treatment, and past experiences with psychedelic substances. Data were analyzed using descriptive statistics and chi-square tests to assess group differences.

Results: A total of 424 participants began the survey, with 262 completing it. Participants (45.6% residing in Canada) generally had positive perceptions of psychedelics, with 77.8% expressing a willingness to try them in the future. 69.7% of participants reported prior psychedelic use, with psilocybin mushrooms being the most commonly used substance. Higher doses and highly meaningful experiences were significantly associated with longer-lasting mental health improvements. Barriers to psychedelic use included legal concerns, health risks, and logistical challenges. Participants with prior psychedelic experience reported greater perceived knowledge and lower perceived risks associated with use. Demographic factors (e.g., sex/gender, nationality, or diagnostic methods) did not influence the reported outcomes.

Conclusions: This study highlights a strong interest and positive perceptions among autistic adults in exploring psychedelics as a potential treatment for their mental health challenges, despite significant barriers to participation. This suggests a pressing need for education, policy reform, and inclusive research practices to improve access to psychedelic therapies/studies for autistic people. Future trials are needed to optimize dosing strategies and explore the long-term benefits of psychedelics in autistic people.

408.020 Are Anxiety and Depression Linked to Independence in Autistic People? - a Cross Cultural Study

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Background: Co-occurring mental health conditions are highly prevalent in autistic people. Independent functioning is frequently more negatively impacted by poor mental health than by autism symptoms alone (Howlin, 2021). However, there is limited understanding of how these co-occurring conditions influence independent functioning, particularly across different cultural contexts. This study aims to explore the relationship between anxiety, depression, and independence in autistic adults across various countries.

Objectives: This quantitative study aims to assess the impact of co-occurring mental health conditions (specifically, anxiety and depression) on the independence of autistic people. This study furthers our understanding of the cross-cultural relationship between mental health co-occurring conditions and independence in autistic people across different countries by conducting a comparative analysis.

Methods: This research adopts a cross-cultural quasi-experimental design to explore differences between autistic and neurotypical participants from economically developed (US, UK, Japan) and developing countries (India, Brazil, Turkey). The study will recruit 240 to 300 participants, including 40-50 autistic adults from each of the participating countries. Participants are being recruited through local support groups, research databases, and collaborating institutions. The study involves the administration of standardized assessments to examine the relationships between anxiety, depression, and independence across these groups. The primary assessments include the Autism Quotient screening tool, Depression Anxiety Stress Scales, and a Visual Analogue Scale of Independence. Data are being collected either online or in person, depending on participant preferences. Multiple regression analyses will be employed to assess the relationship between mental health symptoms and independence, with cultural comparisons using chi-square and t-tests.

Results: As this is a work in progress, data collection is ongoing. Initial findings are expected to shed light on the extent to which anxiety and depression impact the levels of independence in autistic people across different countries. Findings are expected to shed light on the cultural factors that may play a significant role in moderating the relationship between mental health symptoms and independent functioning.

Conclusions: This study aims to contribute to a more nuanced understanding of how co-occurring mental health conditions, particularly anxiety and depression, affect the independence of autistic adults across different cultural contexts. By exploring these relationships, the study hopes to inform culturally sensitive interventions that promote independence and improve the quality of life for autistic people. Ultimately, the findings will advocate for inclusive policies and support systems that account for both autism and mental health needs globally.

NOTE: The data collection has begun, and we are expecting to finish the data collection by April 2025.

408.021 Atypical Postural Control Persists through Adulthood in Autism Spectrum Disorder (ASD): Static and Dynamic Postural Control Deviations in Autistic Adults Ages 30-73

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Background: Postural control deficits are well-documented in autistic children and adolescents, significantly impacting clinical manifestations and interfering with daily activities. Research on postural control in autistic adults, particularly in older age, remains limited. Given the elevated prevalence of neurodegenerative comorbidities (e.g., Parkinsonism) in middle-aged autistic adults, precise quantification of postural variability and coordination may offer critical insights into age-related neuromotor deviations in autistic adults.

Objectives: This study aims to 1) quantify postural sway variability and coordination during static and dynamic stance in autistic adults, and 2) examine age-related deviations in key postural control variables that differentiate autistic adults from neurotypical controls.

Methods: This cross-sectional study involved 47 autistic adults (22F) ages 30-73 years and 48 age-, sex-, and IQ-matched neurotypical controls (26F). Participants completed three 45-second trials on a Qualisys force platform for each of the three conditions: static stance and dynamic anterior-posterior (AP), and mediolateral (ML) postural sways. Center of pressure (COP) metrics were extracted following the standard approach, including standard deviation (COP_{SD}), trajectory length (COP_{TL}), dimensionless squared jerk (COP_{DSJP}) for all conditions, and postural sway frequency (COP_{Freq}), range of motion (ROM_{avg}), and range of motion variability (ROM_{cv}) in the target direction for dynamic stance. Group differences were assessed using repeated-measures ANOVAs with Bonferroni adjustment, while age and group-by-age effects were examined using multi-linear regressions. Spearman's correlations were utilized to explore relationships between key postural control measures and clinical assessments, including the Autism Diagnostic Observation Schedule-2 (ADOS-2) and Repetitive Behavior Scale-Revised (RBS-R). The false discovery rate (FDR) method was applied to minimize Type 1 error for correlation analyses. All statistical significances were interpreted at the level of $p < 0.05$.

Results: Autistic adults showed greater COP_{SD} in both AP and ML directions during static stance, but reduced COP_{SD-AP} during dynamic AP sways compared to neurotypical controls. Autistic adults also exhibited greater COP_{TL} during static stance. COP_{DSJP} quantifies the smoothness of individuals' postural sway, where autistic adults showed COP_{DSJP} reductions during static stance but increases during dynamic sways relative to controls. During AP sways, autistic adults demonstrated reduced COP_{SD} and ROM_{avg}, but increased ROM_{cv} in the target direction compared to controls. No between-group differences were identified for dynamic ML sways. During static stance, neurotypical controls exhibited increased COP_{SD-AP} while autistic adults showed COP_{SD-AP} reductions in old age. No significant correlations were found between postural control measures and ADOS-2 or RBS-R total raw scores after FDR correction.

Conclusions: Our study is the first to examine postural control deviations in autistic adults ages 30-73 during static and dynamic stance. Atypical postural control is reflected as increased sway variability during static stance, while reduced postural coordination (i.e., less smooth COP trajectories) during dynamic stance in autistic adults. Old age differentially affects postural sway variability (COP_{SD-AP}) in autistic adults and controls during static stance. Together, we demonstrate that postural control deviations persist through adulthood in ASD. The extent to which changes in COP variables are associated with the onset and progression of neurodegenerative conditions, such as Parkinsonism, in autistic adults warrants further examination.

408.022 Autigender, Neuroqueer: A Mixed Methods Exploration of the Use Intersectional Labels to Describe Sexual Orientation and Gender Identity Among Autistic Adults

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Background:

Previous research has shown that Autistic people are more likely to identify as LGBTQ+ (see Hillier et al., 2019; George & Stokes, 2018). Within autistic community spaces, intersectional labels (e.g., autisexual, autigender) have become popularized as a label that captures the inability to separate an autistic identity from sexual orientation and gender identity (Valvano & Shelton, 2021). Emerging research suggests the use of such terms can help with distancing Autistic people from more deficit-based identity labels and help with communicating the relationship between autism and SOGI label (Toft, 2024), yet little is known about the use of intersectional labels.

Objectives:

The purpose of this study is to explore how Autistic adults understand and use intersectional Autistic SOGI labels (e.g., neuroqueer, autigender, autisexual).

Methods:

As of October 2024, a total of thirty three participants shared their perspectives on intersectional labels. Participants ranged in their ages from 18-53 ($M = 31.25$, $SD = 9.54$), were largely European American/Canadian (75%), transgender/nonbinary/genderqueer (66.6%), and reported labels of bisexual, pansexual, or queer to describe their sexual orientation (69.4%). Nineteen participants endorsed using neuroqueer to describe their sexuality, ten used autigender to describe their gender identity, while others reported the use of other intersectional terms that were informed by an Autistic lens (e.g., autiqueer, genderfluid). We utilized a reflexive thematic analysis (Braun & Clarke, 2021) to analyze open-ended qualitative responses. We analyzed descriptive statistics to explore perceptions and disclosure of intersectional labels.

Results:

Qualitative results are presented as three themes. Theme 1: Exposure to Labels: Participants reported first learning about intersectional labels in a variety of ways including online spaces (e.g., Facebook, Tumblr), authors (e.g., Dr. Nick Walker), neurodivergent queer community, university LGBTQ center, and this study. Theme 2: Defining Labels: Participants spoke about the ways their neurodivergence informed their understanding of their intersectional labels, noting that it's "impossible to separate" from one another, and that they influence one another. Theme 3: Knowing it Fits: Participants reported feeling "happy and seen and heard" and reflected on the powerful resonance of finding a label that fit, noting "suddenly I had a word."

Descriptive quantitative results revealed that most participants reported they felt they were unable to separate their sexual orientation (66.6%) and gender identity (75%) from their Autistic identity. Regarding use of intersectional labels, participants felt that the use was received positively or very positively (60%) by the Autistic community, neutral or positively (45%) by the non-Autistic LGBTQ+ community, and neutral or somewhat negatively (54%) by the non-Autistic (i.e., neurotypical) people.

Conclusions:

As LGBTQ+ Autistic people increasingly use intersectional labels, it is critical that researchers understand how they are used and the relationships with on identity development, disclosure, and mental health. Many participants in this sample learned about intersectional labels through connection to community, which has been found to be a buffer against stigma events. Additional planned analyses will explore the relationship between use of intersectional labels and stigma, mental health, and community connectedness.

408.023 Autism Spectrum Disorder and Adults Diagnosis: A Study Based on the Brazilian Reality

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Background: The number of autism diagnoses has increased not only among children but also adults. Although there is no consensus among scientists about the cause of this phenomenon, it is known that the evolution of diagnostic methods, dissemination of information about the topic and better qualification of professionals have contributed. The Mapa Autismo Brazil - MAB (Autism Map Brazil) seeks to collect information about the profile of autistic population in Brazil to support quality public policies for both diagnosis and treatment.

Objectives: To outline the sociodemographic profile of autistic individuals who responded to the Mapa Autismo Brazil survey, correlating age of diagnosis with the therapies they underwent in childhood and adulthood.

Methods: MAB is a pilot and exploratory study developed by a non-governmental organization. The study was approved by the Ethics Committee of the University of Brasilia, according to opinion CAAE: 70226623.9.00005540. Two online questionnaires were conducted using the SurveyMonkey platform between July-September 2023. One questionnaire was directed at autistic individuals over 18 years old with autonomy to respond; the other to those responsible for autistic individuals without autonomy to respond.

Results: This study considered 297 responses who answered the questionnaire for autistic individuals. The profile of the autistic individuals who responded to the survey is mostly white (62.29%), female (51.85%), in the age group of 20-24 years old (19.27%), with support level 1 being the most predominant (85.19%).

Verbal people account for 78.45%. The hypothesis of the diagnosis was raised by health professionals and by the autistic individuals themselves in the same percentage (35.55%). The main signs and symptoms indicated as the cause for suspicion of ASD diagnosis were restricted interests (84.85%) and little social reciprocity (73.06%). The highest number of diagnoses occurred between 20 and 24 years old (17.17%). Only 12.79% received the diagnosis before 18 years old; 10.63% at an age over 45 years. The average age of these individuals was 30 years, thus characterizing a late diagnosis. The data indicate that, even without a diagnosis in childhood and adolescence, some individuals had access to psychotherapy (37.37%), speech therapy (15.82%), and psychopedagogy (10.44%). In adulthood, 58.59% engage in some type of therapy, with psychotherapy being the most frequent (93.68%), followed by nutrition (16.09%) and occupational therapy (8.62%).

Conclusions: The research points to late diagnosis as a predominant characteristic among autistic adults, with the average age of diagnosis being 30 years. This fact highlights the historical difficulty of early detection of ASD, which limits intervention in critical phases of development. Psychotherapy is the most common intervention among participants. Even without formal diagnosis, many individuals participated in therapies, which reflects the need for therapeutic support in childhood. The Mapa Autismo Brazil reinforces the need for public policies focused on the early detection of autism and the expansion of multidisciplinary therapeutic approaches, seeking to promote better quality of life and inclusion for people on the spectrum.

408.024 Autism and Quality of Life: Insights from Self-Identified, Diagnosed, and Nationally Representative Samples

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Background:

Quality of life (QoL) is often reported to be lower in clinically diagnosed autistic people than the general population. Despite a growing number of people self-identifying as autistic, the differences in QoL across these diverse populations have not been systematically examined. Expanding research to include this subgroup is crucial, considering many self-identified autistic individuals may not have access to support for their unique difficulties. Additionally, recent studies have indicated that autistic traits, particularly those related to social cognition (e.g., mentalising), are predictive of QoL in clinically diagnosed autistic people, yet their role among self-identified autistic people remains unknown.

Objectives:

Addressing these research gaps, this study examines whether: (i) QoL differs across self-identified autistic, clinically diagnosed autistic, and the general population, and (ii) the impact of mentalising on QoL varies between these groups, while accounting for sociodemographic and individual characteristics.

Methods:

Self-identified autistic adults (SI; $n = 999$), clinically diagnosed autistic adults (CD; $n = 458$), and a nationally representative group of adults from the general population (NR; $n = 1500$) completed an online survey, which comprised self-report measures of mentalising ability (FIMI) and autistic traits (AQ), a measure of cognitive ability (ICAR-16), as well as a range of demographic and health-related questions. Participants also reported their QoL across physical, psychological, social, and environmental domains (WHOQOL-BREF).

Results:

A one-way ANOVA revealed the CD group, followed by the SI group, scored significantly lower than the NR group in mentalising ability. Several covariates, including autistic traits, cognitive ability, and mental health conditions, also significantly differed between groups. After accounting for these covariates, a MANCOVA revealed a significant group effect on combined QoL scores, as well as individual domain scores, particularly in the psychological and social domains, with the SI group reporting the lowest QoL (Figure 1). Lower mentalising ability was also associated with lower combined and individual QoL domain scores. Interestingly, the group $\times$ mentalising ability interaction was only significant when examining the QoL domains individually. The relationship between mentalising ability and QoL was strongest in the NR group, particularly for physical, psychological, and environmental QoL (Figure 2). Other factors, such as relationship status, household income, and the presence of mental health conditions, also significantly influenced QoL.

Conclusions:

Adults who self-identify as autistic generally experience lower QoL compared to, not only the general population, but also those with a formal autism diagnosis. Notably, the influence of mentalising on QoL was less pronounced in both autistic groups than in the general population, suggesting that autistic individuals may rely less on social cognitive skills to navigate their life experiences. Rather, factors like mental health may play a more central role in shaping the lives of autistic people. Our findings highlight the importance of directing attention towards adults who self-identify as autistic—a group that has been historically overlooked in both research and clinical practice—to better conceptualise and support the experiences of those who are on the borderline of diagnostic criteria or undergoing the diagnostic process.



408.025 Autistic Identity Dimensions and Profiles Are Associated with Daily Living and Mental Wellness Among Autistic Adults

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Background: Variation in how autistic individuals identify with autism may play a key role in their well-being, daily life, and relationships. As autistic people generally report poorer well-being and quality of life compared to the general population (Croen et al., 2015; Hollocks et al., 2019; Mason et al., 2018), autistic identity may present a promising avenue for developing effective, neurodiversity-affirming approaches for supporting well-being. While research on autistic identity is increasing (Botha & Gillespie-Lynch, 2022; K. Cooper et al., 2017; Davies et al., 2024), few studies explore the elements that define this identity.

Objectives: This study examines the association between autistic identity, characterized by the Autism Spectrum Identity Scale (ASIS) dimensions of Positive Difference and Changeability, and well-being, as well as daily life and relationships (DLR) of autistic adults. In addition to dimensional analyses, post hoc profile analyses were used to identify variations among participant profiles across measures of well-being and DLR.

Methods: Participants ($N=1,139$) in this online study included formally diagnosed ($n=893$) and self-diagnosed ($n=246$) autistic adults. Surveys measured autistic identity (ASIS; McDonald, 2016), quality of life (AAQoL; Brod et al., 2006), self-esteem (RSE; Rosenberg, 1965), stigma (SS; King et al., 2007), and questions about loneliness and self-care. We used multivariate general linear models to examine the relationships between Positive Difference and Changeability dimensions and well-being and DLR domains. In post hoc analyses, we imposed categories based on these identity dimensions and examined relationships between identity profiles and well-being and DLR domains.

Results: Dimensional analyses demonstrate that, controlling for Changeability, greater endorsement of autism as a Positive Difference was associated with greater psychological health as measured by the AAQoL ($F(3,1040)=26.37, p<2.2e-16$), self-esteem ($F(3,1071)=128.2, p<2.2e-16$; see Figure 1), and lower fear of disclosure ($F(3, 826)=58.01, p<2.2e-16$). When controlling for Positive Difference, greater endorsement of Changeability (i.e., viewing autistic traits as changeable or malleable) was associated with greater life productivity ($F(3, 1015)=27.09, p<2.2e-16$), relationship satisfaction ($F(3, 1040)=25.49, p=6.484e-16$), and self-care ($F(3, 1070)=18.07, p<1.929e-11$). Post hoc results showed that endorsing both Positive Difference and Changeability was linked to the greatest well-being, while Positive Difference was more associated with mental well-being and Changeability was more strongly related to DLR domains (see Figure 2).

Conclusions: Autistic adults who viewed autism as making a positive difference in their lives and as malleable reported the highest levels of well-being and DLR, while those who were least likely to endorse these identity dimensions had the lowest levels. Post hoc analyses highlighted distinct identity profiles, revealing individual and synergistic roles of positive difference and changeability on well-being and DLR. These findings emphasize the need to support diverse experiences and perspectives within the autistic community, and inform peer support programs and therapeutic approaches aimed at improving the quality of life and mental health of autistic adults.



408.026 Autistic Individual's Transition to Higher Education: Accessibility and Acceptability of College Support Services

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Background: Autistic individuals are entering college at growing rates and report significant challenges in college (Shaw et al, 2023). Accessing disability/accessibility services and supports (DAS) is a known factor to facilitating success in college for autistic individuals (Cai & Richdale, 2016). The UNC TEACCH School Transition to Employment and Post-Secondary Education (T-STEP) Program is a transition to adulthood program that includes a 12-week transition to college course and 12 hours of counseling on higher education, career exploration, and self-advocacy. Taking place either virtually or in-person at a local community college campus, the counseling sessions include education about and visits with colleges' offices of DAS, the career center, the writing center, and the tutoring center.

Objectives: Are transition counseling sessions effective in improving access and/or satisfaction of these services? How do individuals assigned female at birth (AFAB) compare to those assigned male at birth (AMAB) in their rates of access and satisfaction with DAS and other college support center?

Methods: Participants were 94 autistic young adults that formerly completed the T-STEP Program and attended college. T-STEP participants from two RCTs were included in this study with 1 RCT using a waitlist control design and 1 RCT using a comparative efficacy study with some students receiving the comprehensive T-STEP and some receiving the counseling without the class. All participants completed the counseling sessions. Participants completed a brief online survey about their higher education experiences after the T-STEP at 3-4 months after completing the program and again 1-5 years later.

Results: Of the 94 students completing the T-STEP who had graduated from high school, 55 (56%) had attended or were attending college. Notably, 83% of students attended a 2-year college. Most students are accessing disability services (67%) and rating them good (49%), great (32%), or excellent (11%). AFAB individuals were more likely than AMAB individuals to access disability/accessibility services ($\chi^2(1, N = 53) = 6.2, p = .02$). However, AFAB and AMAB individuals did not differ in their satisfaction ratings ($t(34) = -1.1, p = .277$). Of those accessing DAS, (35.29%) were accessing at least 1 other support service through their colleges.

Conclusions: Similar to past reports, the majority of autistic high school graduates in this study elected to attend a community college instead of or before attending a university (Roux et al., 2015). Participants in this study appear to be accessing DAS more often than other autistic college students (Newman et al., 2011; Petcu et al., 2021) supporting the efficacy of the T-STEP counseling program. These results support the importance of educating transition aged autistic students on the supports available at college to increasing the likelihood of autistic college students advocating for themselves by accessing these services. Future research is needed to identify which students benefit the most from this type of low intensity (12 hours) higher education counseling program and which students benefit from more intensive transition support services (e.g., the full 60-hour T-STEP program).

408.027 Autistic Physicians: A Hidden, Unaddressed, Physician Health and Wellness Issue

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Background: Understanding the needs of autistic people within specific disciplines is important in fostering greater understanding and integrating needed supports. The public has shown interest in media accounts of autistic doctors in part reflected in popular television medical dramas. A 2017 Scientific American article asked 'Could someone with autism be a superstar surgeon?' Dr. Darold Treffert concluded 'Yes, it's definitely plausible' but could find no examples. In 2020 Dr. Nina Purvis wrote 'Autistic doctors – we're not exactly as portrayed on TV'. As exemplified in these accounts, there is need for disciplinary understanding, in this case, in medicine, related to autism. The literature contains information indicating that autistic doctors do exist but very little is known about them and the medical profession has done little to embrace neurodiversity.

Objectives: The research question was 'What has been written about autistic physicians?' with sub-questions 'Does autism interfere with their ability to practice medicine?' and 'Does autism affect their health and wellness?'

Methods: A narrative literature review was completed on the subject of autistic physicians, synthesising results of computerised database searches, authoritative text searches and hand searches. Peer reviewed and lay press material was included, using multiple medical, psychological and general databases. Searches used keywords including 'autism', 'autistic', 'physician', 'doctor', 'Asperger's' and 'savant' and combinations. Boolean operators, adjacency techniques and stopping rules were utilized and the bibliographies of retrieved literature were also searched. Inclusion and exclusion criteria were set. Descriptive analyses evaluated publication type, number of cases, physician specialty, mental health and ability to practice. Qualitative analysis sought out common themes.

Results: Forty-five documents were identified on the subject of autistic physicians, including peer-reviewed papers, editorials, commentaries, letters to the editor, book chapters, a newspaper story, and 'fitness to work proceedings'. Reports emerged in three phases and were sparse prior to increased publication starting in 2019.

Phase 1: Anecdotal cases: These identified the existence of real life autistic doctors in patient contact specialties, and identified experiences of feeling stigmatised, masking their existence, struggling with life, in career difficulties, calling for help and with no confidence in provided support services.

Phase 2: Commentaries, editorials and opinions: Common themes included that autistic people are drawn to medicine and have traits, which make them good practitioners. Most function well but get into difficulties if demands (especially administrative), exceed ability. Interpersonal misunderstandings, sensory reactivity, and mental exhaustion could precipitate problems.

Phase 3: Original research studies: Only five studies were found. A survey indicated 1% of doctors are autistic. Studies confirmed that most are functioning well, mostly in general practice and psychiatry, although high rate of psychiatric conditions and suicide risk was reported.

Conclusions: Very little is known about autistic doctors, including their professional experiences. Limited data suggests they are practicing satisfactorily but masking, with fear of stigmatisation. They report sensory overload, and interpersonal communication problems that evoke stress and career difficulties, as well as high rates of mental health conditions. Further understanding, supports and research are needed.



408.028 Autistic, Socially Anxious, and Neurotypical Adults Use Similar Profiles of Emotion-Regulation Strategies Based on Momentary Mood

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Background: Difficulties regulating emotions effectively may contribute to negative mental health outcomes in adults diagnosed with autism and social anxiety. Traditional research on emotion-regulation of autistic and socially anxious adults often relies on self-reports littered with memory bias and lab-controlled environments that fail to capture the emotional experiences these populations experience day-to-day. Ecological momentary assessment (EMA) mitigates these challenges by using real-time data collection, offering ecologically valid interpretations of the variables being studied. As emotion-regulation research shifts toward EMA methods as the preferred approach for gathering emotion-regulation data, understanding how emotion-regulation strategies vary in response to momentary mood affect can inform specific suggestions to improve emotion-regulation across different emotional contexts.

Objectives: This exploratory study analyzed data from a 9-month EMA of mental health behaviors in adults. We examined possible changes in profiles of emotion-regulation strategies according to type of affect experience (positive or negative) across three groups of adults: an autistic group, a socially anxious group, and a neurotypical comparison group.

Methods: Seventy-nine participants, including individuals diagnosed with autism (AUT; n = 27), individuals diagnosed with social anxiety (SA; n = 27), and a neurotypical comparison group (NT; n = 25), completed daily surveys related to their experience of both positive and negative emotions over the past 24 hours, and also how often they used each of six emotion-regulation strategies: savoring, acceptance, reappraisal, suppression, self-blame, and dampening. Multilevel logistic regression models examined within-person associations between mood affect and strategy use as well as interactions between group status and within-person mood affect. Results were adjusted using the Benjamin-Hochberg procedure to control the false discovery rate.

Results: There were no group differences in the pairing of negative affect and adaptive regulation strategies. All groups reported that negative affect was associated with a decrease in the odds of using savoring and acceptance strategies, with no change in the odds of using reappraisal. For all groups, greater negative affect increased the odds of using maladaptive suppression, self-blame, and dampening strategies. Additionally, the experience of positive affect increased the likelihood of use for savoring and acceptance and decreased use in self-blame with no change in the odds for suppression or dampening use across all groups.

Conclusions: In all cases, self-reported use of emotion-regulation strategies in response to both positive and negative affect was similar for all three comparison groups, which contrasts with previous research that suggests that autistic and socially anxious adults typically show different emotion-regulation patterns than neurotypical groups. These findings raise questions about the contexts in which these strategies are used or the accuracy of self-report measures in capturing real-time emotion-regulation. However, the small sample size and limited geographic scope caution against broader generalizations. Future EMA studies should utilize higher temporal resolution or incorporate physiological measures to gather more contextual data that better links emotion-regulation strategy use to more specific emotional experiences. These insights could enhance interventions aimed at improving emotion-regulating abilities in adulthood, particularly for autistic adults.

**408.029** Behavioral Health & Service Utilization Among Autistic Adults in the All of Us Research Program

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Background: Often, autism research registries involve participants who identify in dominant groups in society (e.g., White, heterosexual, and socioeconomically-advantaged), making it difficult to generalize findings unto marginalized groups. In an effort to rectify this, the goal of the current research study is to examine the currently available behavioral health data among people who identify as autistic within the All of Us (AoU) Research Program.

The AoU Research Program is an NIH-funded effort to recruit populations that have been historically underrepresented in biomedical research (e.g., racial/ethnic minorities, LGBTQ+, individuals with disabilities); it has currently enrolled >500,000 US participants. As such, comprehensive analysis of AoU data, utilizing an open-science framework, will allow us to examine the extent to which disparities exist between our typical research samples and those from underrepresented communities.

Objectives: Broadly, we are focused on 3 main objectives using the AoU database:

1. To characterize the autistic sample based on key sociodemographic variables,
2. To evaluate reported behavioral health problems and service use, and
3. To explore whether specific social determinants of health (SDoH) are associated with behavioral health outcomes among autistic people.

Methods: We are currently using descriptive analyses to characterize the sociodemographic make-up and basic behavioral health and service utilization patterns within an identified cohort of autistic individuals. As of October 2024, N=1231 adults were identified as having 'autism spectrum disorder' (0.67%).

Results: At the time of completing the surveys, 66% of the autism cohort were between the ages of 18-44 years, 23% were between 45-64 years, and 11% were 65+ years. Fifty-nine percent of participants indicated their assigned sex at birth as female, and 38% as male. In terms of gender, 33% identified as 'male' (as indicated on the survey), 42% as 'female,' and 12% identified with a different gender identity. There is additional variability regarding when participants learned of their autism diagnosis; ~38% of participants reported that they learned of their diagnosis in childhood, compared with 60% in adulthood (18-64 years), and around 3% after the age of 65. Despite ~45% of the AoU database being represented by racial/ethnic minorities, most autistic participants identified as White (82%) and Not Hispanic/Latino (88%).

AoU-generated Initial descriptive analyses identify the "top 10 conditions" (physical and mental) experienced in a selected cohort. Of note, the top three conditions reported were anxiety disorder (19%) and major depression, single episode (17%), followed by chronic pain (14%). Additionally, ~24% of the cohort reported currently being prescribed medication and/or are receiving services related to autism.

Conclusions: There is a wealth of data on autistic people and their families in the AoU Research Program, available for collaborative scientific inquiry. Additional planned analyses will examine in further detail sociodemographic, behavioral health, service utilization, and SDoH, to identify initial indicators related to health and wellbeing among a diverse representation autistic people. Future research may contrast findings with other large autistic and/or comparison samples, ultimately with significant potential for meaningful clinical, research, and policy implications.

408.030 Being Confused with Choice? Choice Architecture Interventions to Reduce the Choice Confusion of People with Autism
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Background: Autobiographical reports and empirical findings of survey studies suggest that people with autism experience choice-making to be difficult, confusing and stressful. The notion is that people with autism may be especially susceptible to adverse effects of increasing choice freedom in society. Given the central role of choice-making in daily lives, it is important to examine the impact of autism on choice-making in order to support people with autism in a targeted way.

Objectives: This paper explores (1) whether individuals with autism experience more confusion in choice-making compared to neurotypical individuals and (2) interventions in the choice architecture to reduce choice confusion for individuals with autism. The paper consists of three studies. In Study 1, the general tendency to be confused in choice-making is measured by the Consumer Confusion Proneness scale (CCP) of Walsh et al. (2007) which provides measures for choice similarity confusion, choice overload confusion and choice ambiguity confusion. In Study 2, the subjective experiences of choice confusion are measured across a series of choice tasks that differ in choice product and size of choice assortment (Fig.1). In

study 3, three interventions in the choice architecture to reduce the choice confusion of autistic consumers are examined (ordering choice options on a key attribute, categorizing choice options with informative category labels, sequential presentation of choice options).

Methods: Participants with autism were invited via organizations in Flanders and the Netherlands to participate in the online survey. Neurotypical participants were contacted by social media. In Study 1, the CCP-scale data of autistic and matched neurotypical participants were analyzed by a multi-group CFA (MGCFA). In Study 2, a multi-level modeling (MLM) analysis is applied to study the subjective experiences of choice confusion among autistic and neurotypical participants across a series of choice tasks. In study 3, a MLM analysis is used to examine the impact of interventions in the choice architecture in reducing the experience of choice confusion among autistic and neurotypical participants.

Results: The MGCFA-outcomes (Fig.2) show that the proneness for choice similarity confusion, choice overload confusion, and choice ambiguity confusion was significantly higher among participants with autism (differences in latent means of .931, .812 and .662 (all $p < .001$). The MLM estimations (Study 2) show that participants with autism experience more choice confusion than neurotypicals (Figure 3). In Study 3, the MLM demonstrates that ordering and categorizing choice options are two effective interventions in the choice architecture to reduce choice confusion among autistic individuals (and neurotypical individuals). The opposite holds for the sequential presentation of choice options (Figure 5).

Conclusions: The findings demonstrate that (1) individuals with autism have a higher general tendency to be confused in choice-making compared to neurotypicals (Study 1), (2) the subjective experiences of choice confusion observed among autistic

individuals did not differ significantly across the examined choice settings (Study 2), and (3) the ordering and the categorization of choice options are two effective interventions in the choice architecture to reduce choice confusion among autistic individuals



408.031 Understanding How Emotional States and Friendships Relate to Community Participation in Autistic Young Adults: A Mixed-Methods Study

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Background: Community participation (CP) is essential for health and well-being. During the transition to adulthood, CP provides a context for key developmental tasks of adulthood, such as developing autonomy, identity, and social relationships. However, autistic young adults often report a decline in and poor satisfaction with CP after high school. Prior research has identified that depressive and anxious feelings, and friendship, are related to CP in autistic people. However, little is known about how different aspects of emotion and friendship are related to CP, particularly in young adulthood. Moreover, the relationships between emotion, friendship, and CP experiences, including both objective (frequency) and subjective (importance), are understudied. Understanding these relationships is crucial for developing effective strategies to support CP in autistic young adults.

Objectives: We conducted a convergent mixed-method study to answer these questions:

1. Which emotional states and aspects of friendship are associated with CP?
2. How do autistic young adults describe their emotional states and friendships in the context of CP?

Methods: Thirty-five autistic young adults without intellectual disability (ID; ages 18-29) completed online measures, including the Depression Anxiety Stress Scale (DASS), friendship items from the Adult Self-Report (ASR), and the Temple University Community Participation (TUCP) measure. Most participants were White (73.5%), and 48.6% were Female. Follow-up interviews were conducted with 14 participants. We conducted correlations between DASS anxiety, depression, and stress subscales, ASR friendship items (number of close friends, self-reported friendship quality) and TUCP outcomes (frequency, importance, diversity, breadth, and sufficiency; see Table 1). Qualitative interviews queried why community activities were important and what made it easy or hard for participants to engage in CP. Interviews were transcribed, coded, and analyzed using thematic analysis. Themes were identified based on the coded data and case summaries.

Results: Key findings of the quantitative and qualitative data are presented in a joint display (Table 2). Quantitatively, higher levels of anxiety were associated with fewer important community activities and a lower degree of engagement in those important activities (breadth). Higher friendship quality was associated with greater frequency, diversity, breadth, and sufficiency of CP. Qualitative interviews revealed the following themes: (1) aspects of social situations influenced how young adults engaged in community activities, (2) young adults recognized the positive influence of CP on their mood, (3) young adults engaged in community activities to build friendships, and (4) accompanying friends boosted satisfaction with CP and motivated young adults to try new activities.

Conclusions: Quantitative findings showed that anxiety states were linked to subjective experience of CP; friendship quality was related to both objective and subjective experience in autistic young adults. Qualitative findings provided further insight into the reasons for these associations; friendships facilitated and provided benefits to CP. Programs supporting young adults to manage anxiety in social situations may improve their CP experience. Interventions targeting both CP and close friendships might be effective in supporting CP and mental health. Future steps include understanding CP in young adults with different support needs (e.g., individuals with ID) and diverse racial and ethnic backgrounds.



408.032 Brain Network Activity in Autistic and Non-Autistic Adults Thinking about Preferred Interests

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Background: Preferred interests are common, intense, and idiosyncratic among autistic people. Autistic people commonly use preferred interests as an emotion regulation strategy, particularly to reduce anxiety. Among general samples, “savoring” (thinking about) positive topics increases positive affect and emotions, and reduces anxiety. The extent to which thinking about preferred interests resembles or differs from savoring, neurally, is unclear. Given the clinical implications of preferred interests, autistic and non-autistic adults may have different levels of brain network activity when thinking about preferred interests and positive topics.

Objectives: 1) To contrast how brain activity differs between autistic and non-autistic adults when thinking about preferred interests and savoring. 2) To examine how differences in brain network activity correlate with emotion dysregulation.

Methods: Participants (n=79) included 59 study-diagnosed autistic and 20 verified non-autistic adults (mean age=32.62, range = 18-60 years). Gender demographics comprised of 22 male (12 autistic), 33 female (23 autistic), 11 nonbinary (10 autistic), 13 other gender (12 autistic). Racial demographics included 57 white (47 autistic), 11 Black (6 autistic), 4 Asian (2 autistic), and 8 other (5 autistic). All participants completed a 5-minute task consisting of cognitive and emotional operations during functional MRI assessment. The task included conditions that required participants to think about positive (savor) and interesting (interest) topics for 10 seconds at a time, each for two blocks. Prior to the scan, participants generated personally relevant topics in each category and completed the Emotion Dysregulation Inventory questionnaire (EDI-SR). We compared neural activity in 12 theoretically identified, a priori, meta-analytically (Neurosynth) derived brain networks (task, social, sensation, self, salience, pain, motor, memory, interoceptive, executive, emotion, default, attention, arousal) during interest, savor, and rest conditions. We examined group differences in means and distributions. Across groups, differences in neural reactivity was correlated with the EDI-SR Dysphoria and Reactivity Indices.

Results: There were no significant differences between groups when comparing interest, savor, and rest conditions (see Figure 1). Between the two groups, we found distribution differences in the executive, memory, salience, and task networks for the interest minus rest condition, and in the memory network for the interest minus savor condition. Overall, we found lower network reactivity in the autistic group than the non-autistic group. We also found significant correlations between several brain networks and both reactivity and dysphoria for the interest minus rest and interest minus savor conditions (see Table 1). The savor minus rest condition did not yield any significant correlations.

Conclusions: Surprisingly, autistic and non-autistic adults showed no differences in commonly examined brain networks implicated in perception, emotion, and cognition when thinking about preferred interests and savoring positive topics. Moreover, adults who are more emotionally reactive or dysphoric engage less with their preferred interests neurologically, possibly because emotion dysregulation consumes cognitive resources. However, future studies should investigate relationships between neuroimaging and behavioral/observational data to inform our understanding of preferred interests in autistic adults.



408.033 Camouflage, Self-Esteem, and Mental Well-Being in Autistic Adults in Japan*M. Sunagawa, Clinical Psychology, Ochanomizu University, Bunkyo, Tokyo, Japan*

Background: Camouflage is a set of strategies that autistic people use in social situations to hide aspects of their autistic characters and try to fit in with others (Hull et al., 2020). Although camouflage has the adaptive aspect, it also affects self-esteem and increases the risk of mental health deterioration (Hull et al., 2021). The association between camouflage and mental health has also been suggested to differ by country, with over- or under-camouflage being associated with worse mental health in Japanese autistic individuals (Oshima et al., 2024). However, research findings are scarce, and the actual state of camouflage among Japanese autistic individuals is not clear.

Objectives: This study aimed to examine the relationship between camouflage, self-esteem and mental health among Japanese autistic adults.

Methods: Japanese version of the following measurement scales were used: the Camouflaging Autistic Traits Questionnaire (CAT-Q), the Rosenberg Self-Esteem Scale (RSES), and the World Health Organization-Five Well-Being Index (WHO-5). This study included 118 Japanese autistic adults (97 women, 17 men, and four others; mean age 37.0 years) who self-reported formal diagnosis of autism related condition.

Results: Results suggest that camouflaging autistic traits using assimilation is associated with an increased risk of experiencing thwarted self-esteem and mental well-being, but no association was found between either compensations or masking and RSES or WHO-5 scores. The characteristics of the combination of camouflage strategies showed a significant association between masking and self-esteem when compensation scores were high, but no association was found when compensation was low or average.

Conclusions: Among the camouflage strategies, assimilation was associated with lower scores on self-esteem and mental health in Japanese autistic individuals. However, the results suggest that the effects may differ depending on the combination of camouflage strategies. These findings indicate that assimilation may have a stronger negative impact on self-esteem and mental health than other camouflage strategies, possibly due to assimilation being a way of playing a different character from one's true self, which is considered to be more deeply related to one's self-identity. Therefore, compared to compensation and masking, the effects on self-esteem and mental health were considered more significant. This highlights the need to carefully consider the psychological costs of encouraging such strategies in social communication support and underscores the importance of refraining from approaches that encourage assimilation. Additionally, there is potential for effectively using compensation and masking as an adaptive strategy for conscious and short-term purposes. Further study is needed to understand the influence of socio-cultural factors on camouflage in non-Western countries, as well as the diversity of camouflage styles.

408.034 Camouflaging and Anticipation of Social Rejection Are Associated with Elevated Physical Health Symptoms in an Autistic Adult Sample*R. Baliga¹, A. Senanayake¹, R. H. Himelstein² and K. O. Gotham², (1)Rowan University, Glassboro, NJ, (2)Psychology, Rowan University, Glassboro, NJ***Background:**

Minority stress may contribute to poorer physical health outcomes across various minority groups: Discrimination correlates with reduced access to medical treatment among LGBTQ+ individuals, increasing risk for breast cancer, asthma, and HIV/AIDS (Lick et al., 2013). Black individuals face healthcare-related discrimination (e.g., not being given pain medications; Dhaem et al., 2020); discrimination correlates with nausea, stomachaches, and breast cancer (Yazdiha et al., 2022).

Ableism (i.e., discrimination against individuals with physical and/or mental disabilities) may similarly correlate with adverse physical health outcomes; however, research on ableism and physical health is sparse. Croen et al. (2015) found that autistic individuals who may experience autistic-identity-based ableism were more likely than non-autistic individuals to experience health problems, including gastrointestinal and sleep problems. Overall, research on the effects of minority stress among autistic individuals is needed.

Objectives:

To examine the association between autistic camouflaging and anticipation of social rejection – psychosocial processes that potentially reflect experiencing ableism – and physical health symptoms in autistic adults.

We anticipate greater self-reported camouflaging, or masking of autistic traits, and greater anticipation of identity-based social rejection will be associated with greater likelihood of endorsing stomachache, nausea/vomiting, headache, dizziness, and sleep difficulties.

Methods:

N=303 autistic adults participated in a three-timepoint survey study of well-being through the SPARK online autism registry (Feliciano et al., 2018). The current study focused on cross-sectional analyses of Timepoint 1 data.

We used the Camouflaging Autistic Traits Questionnaire (CAT-Q; Hull et al., 2019) to measure autism-specific masking; Expectations of Rejection Scale (Botha, 2020) to measure anticipation of identity-based social rejection; and Adult Somatic Symptom Questionnaire (Williams, n.d.) to measure bothersomeness of physical symptoms.

Assumptions held for separate binary logistic regression models predicting each physical symptom, covarying for chronological age and gender.

Results:

Holding age and gender constant, for each one-point increase in camouflaging, odds of reporting stomachache increased by 2.16% (95% CI [.011, .033]); nausea/vomiting by 1.87% (95% CI [.008, .03]); headache by 1.54% (95% CI [.003, .028]); dizziness by 3.08% (95% CI [.019, .043]); and sleep difficulties by 2.24% (95% CI [.009, .036]) (see Table 2).

Similarly, controlling for age and gender, for each one-point increase in anticipation of social rejection, the odds of reporting stomachache increased by 4.02% (95% CI [.006, .076]); nausea/vomiting by 5.7% (95% CI [.024, .092]); dizziness by 5.64% (95% CI [.022, .094]); and sleep difficulties by 5.51% (95% CI [.013, .101]) (headaches n.s.; see Table 2).

Women, non-binary, or other gender respondents were more likely to endorse nausea/vomiting than men (95% CI [1.061, 2.967]).

Conclusions:

Our study suggests that autistic adults who engage in camouflaging and anticipate social rejection have a significantly greater likelihood of reporting stomachaches, nausea/vomiting, dizziness, and sleep difficulties; camouflaging was also related to greater endorsement of headaches. These findings represent preliminary evidence that minority stress may be associated with adverse physical health outcomes among autistic adults, indicating the need for future study of the harmful effects of ableism.



408.035 Caregivers' Mental Health and Well-Being in Supporting Autistic Individuals' Transition to Adulthood

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Background: As autistic individuals transition to adulthood, they often experience a reduction in available support services (Wolpe et al., 2023). This leads to a significant burden and heightened levels of stress and anxiety among their caregivers (Herrema et al., 2017). Caregivers frequently express concerns about their autistic adults' ability to live independently and the financial pressures associated with limited employment opportunities and low wages (Dillenburg & McKerr, 2011).

Objectives: This study aimed to explore caregivers' perceptions of mental health services and supports available as they assist their autistic adults' through the transition to adulthood. Additionally, the study sought to gather advice caregivers might offer to others currently navigating this transition period.

Methods: We conducted semi-structured interviews with 17 caregivers of autistic adults (aged between 19 and 33) who participated in an eight-week STEM internship at a university in the western United States in 2021. The sample included 10 mothers, 1 father, 1 great-aunt, 1 caregiver who selected "Other", and 3 participants who did not disclose demographic information. Each interview was conducted via Zoom, lasting approximately 45 minutes. Interviews were audio-recorded, transcribed verbatim, and analyzed using a thematic coding approach. A codebook, including all the code names, definitions, and representative examples, was developed to ensure consistent coding. Data were analyzed using the Dedoose software program.

Results: Three major themes emerged from the interview data: (1) caregiver's mental health experiences during their autistic adults' transition to adulthood, (2) the types of support caregivers have received or wish to receive, and (3) practical advice for other caregivers undergoing a similar transition period. Caregivers frequently reported feelings of emotional, physical, and financial exhaustion due to the demands of supporting their autistic children. Many highlighted the difficulty of finding appropriate services and resources. In terms of advice, caregivers recommended seeking out support groups, engaging in self-care, and employing positive reinforcement strategies to help manage stress and maintain a positive outlook.

Conclusions: The study underscores the urgent need for targeted mental health support and resources that are specifically designed for caregivers of autistic adults. Recommendations for improving caregiver well-being will be discussed, with an emphasis on accessible services and community-based supports that help reduce caregiver burden and enhance their ability to cope with the demands of this life stage.

408.036 Childhood Traumas, Mental Health Conditions, and Suicide-Related Behaviours Among Autistic Adults

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Background: Autistic people have a higher risk of mental health conditions, suicide, self-harm, and suicidal thoughts compared to others. In the general population, childhood trauma increases the likelihood of suicide, particularly among individuals who experience emotional or physical abuse. However, there is a lack of research examining this relationship in autistic adults.

Objectives: To determine whether specific childhood traumas are associated with suicidality and poor mental health in autistic adults.

Methods: Data from an existing, anonymized, self-report survey (the Vulnerability Experiences Quotient [VEQ]) was used to catalogue the frequency of childhood traumatic experiences among autistic and non-autistic people. The VEQ was developed through a participatory framework and includes nine childhood traumas that were investigated individually. The final sample included n=769 participants (including 424 autistic adults). Three iterative models of unadjusted and adjusted binomial logistic regression models were utilized (accounting for age, education-level, country of residence, and childhood traumas). A multiple comparison correction was applied to reduce Type I errors using the Benjamini-Hochberg method.

Results: Autistic adults were more likely to experience poor mental health and suicide-related behaviours than others. After accounting for demographic differences and childhood traumas, autistic people were 3 times more likely to self-harm, 2.2 times more likely to make suicide plans, 2.8 times more likely to attempt suicide, and 4 times more likely to have a mental health condition that affects their daily life than others. However, being autistic was not a significant factor in substance abuse (OR: 1.01, 95% CI: 0.70, 1.44, p-value: 0.97). In the overall sample, rumours being spread by other children and sexual abuse by an adult were associated with suicide attempts. These were the only types of childhood traumas significantly associated with suicide attempts in this study. Sexual abuse by an adult was significantly linked to self-harm and substance abuse. Additionally, being physically hurt by other children was significantly associated with experiencing daily mental health conditions. Strikingly, our findings showed a downward shift in the effect size of an autism diagnosis for all three suicide-related behaviours and experiencing a daily mental health condition after childhood trauma is factored in. For example, autistic people are 5 times more likely to engage in self-harm compared to non-autistic people without accounting for childhood trauma, which decreased to 3 times more likely after accounting for trauma. Full results are reported in Table 1.

Conclusions: Even after accounting for demographics and childhood trauma, autistic people have increased risk of suicidality. This provides preliminary evidence that autism may be an independent risk factor for suicide. These findings provide evidence of complex relationships between autism, trauma, and risk of suicide-related behaviours and daily mental health conditions. Our findings suggest that sexual abuse is a risk factor for suicide among autistic people, aligning with trends in the general population. Clinicians must take childhood trauma histories and provide needs-based care for autistic people. Additionally, early interventions and safeguarding strategies that target childhood traumas should be implemented in childhood to curb the effects of these traumas during the transition into adulthood.



408.037 Clinical and Demographic Characteristics of Autistic Individuals Diagnosed in Middle Age or Later Adulthood: A Clinic Sample from 2012-2022

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Background:

As public understanding and awareness of autism spectrum disorder (ASD) has increased, a greater number of individuals have begun to seek first-time evaluations and diagnoses of ASD in adulthood. However, as most research focuses on autistic adults diagnosed in childhood, little is known about the clinical and demographic characteristics of older adults seeking diagnostic clarification later in life.

Objectives:

The purpose of this study was to explore the clinical and demographic characteristics of adults receiving a first-time diagnosis of ASD in later adulthood (ages 40 and above).

Methods:

This study involved a retrospective record review from an outpatient clinic specializing in the diagnosis of ASD in adulthood over a 10-year period (2012 to 2022). Participants ($n = 76$) were drawn from an outpatient clinic specializing in the diagnosis of ASD in adults. Variables of interest included measures of ASD (i.e., scores from the ADOS-2, SRS-2, AQ, and EQ) and demographic characteristics (i.e., sex, education, relationship status, employment status, living situation, and co-occurring conditions). SPSS was used to generate descriptive statistics and frequencies for variables of interest. Correlations between variables were calculated as well.

Results:

Most participants in this sample were employed full time, married or in committed relationships, and lived independently. Nearly half of the sample had obtained a graduate degree. Participants, despite meeting criteria for ASD, on average, did not exceed the cutoff score for autism on the Autism Diagnostic Observation Schedule, Second Edition, Module 4 (ADOS-2; Lord et al., 2012). However, scores on self- and informant-report measures revealed clinically significant difficulties associated with core and associated features of ASD.

Conclusions:

Overall, the results of this study suggest that individuals who receive a diagnosis of autism for the first time at the age of 40 or above may have met typical societal expectations for adulthood (e.g., full-time employment, long-term relationships, etc.), while still evidencing clinically significant autistic traits. In addition, this study substantiates evidence on the importance of supplementing the ADOS-2 with self- and informant-report measures with a full developmental history when making diagnostic decisions for older adults who are suspected of being on the autism spectrum. This study provides an important first step in understanding how individuals first evaluated in older adulthood perform on self- and informant-measures of autism symptoms and their demographic characteristics. Future work should continue to explore not only the critical variables that impact success for children diagnosed with autism, but those that impact functioning for older autistic adults diagnosed in adulthood.

408.038 Co-Production of Complex RCTs with Autistic People: Reflections of the Autistic Advisory Group of the Strata RCT

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Background:

The benefits of co-production and involvement of autistic people are increasingly recognized in autism research. However, randomized controlled trials (RCTs) with autistic adults are relatively rare, and even rarer are accounts of RCTs that integrate the voices and expertise of autistic people throughout the research process. In June 2018, an autistic advisory group was formed to advise on a grant/funding application for what would eventually become the STRATA placebo-controlled RCT of sertraline for anxiety in autistic adults. For over 6-years, the group have continuously been closely involved in all stages of this large, complex international medication RCT.

Objectives:

This presentation, led by an autistic member of the STRATA advisory group, will provide a detailed account of:

- how co-production was implemented in this complex study and the challenges and opportunities towards meaningful contributions
- the impact of the autistic advisory group's contributions in shaping the study's aims, methodology, participant recruitment and retention, and planned dissemination.
- how being a part of this study impacted on the advisory group members
- lessons for future RCTs in co-producing meaningful research with and for autistic people.

Methods: STRATA was a multicenter, pragmatic, double-blind RCT aiming to assess the effectiveness of sertraline versus placebo in reducing anxiety in autistic adults, and to understand its adverse effects. The trial was conceived in 2018 with the autistic advisory group providing input on the acceptability of the design and measures ahead of the funding application. The trial was funded and set up during the Covid-19 pandemic and closed to recruitment in 2023, having surpassed the enrolment target (n=318). The 12-month follow-up phase is nearing completion in October 2024. The advisory group met regularly throughout the life-cycle of this trial. Oral histories and written reflections of members of the autistic advisory group collected for the period between 2018 to early 2025 will be synthesized and presented.

Results:

The advisory group provided input into all stages of the trial. Co-production included helping shape the funding application, test and time outcome measures, shaping the study protocol and the participant facing processes, advising on ethical concerns, representation at the ethics (IRB) committee, trial management groups and staff recruitment panels, staff training including videos that helped new researchers understand the trial process and communication with autistic people, reviewing participant materials for accessibility, ensuring safety and adverse effect information was effectively communicated whilst proactively anticipating participant concerns, contributing to planning of the statistical analysis and dissemination to different stakeholders. There were tangible benefits of the involvement of the advisory group in relation to strong recruitment (104% of required), retention (92% at primary outcome), and participant feedback. The group members described several benefits of contributing to this study and experienced personal and professional growth.

Conclusions:

The reflections highlight that it is possible to co-produce large complex multicenter RCTs with meaningful involvement of autistic individuals. This can in turn enhance the quality of the research and the experience of participants leading to higher levels of engagement and retention in such studies.

408.039 A Daily Living Skills Intervention through Executive Function Strategies for Adolescents/Adults with High Functioning Autism: A Pilot Study

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Background: High Functioning Autism Spectrum Disorder (HFASD) persons have daily living skills (DLS) deficits, which are skills generally required to function independently in home, community, school and workplace. Research have found that DLS is a significant predictor of success in areas such as employment, tertiary education and quality of life. Currently, there are very few group interventions aiming to improve HFASD's DLS. A pilot randomized controlled trial (RCT) targeting specific skills (grocery shopping, preparing/cooking a dish, cleansing cooking equipment/environment) was conducted to examine its effectiveness. While these specific skills targeted constitute only a subset of the entire DLS skillset, we specifically chose these skills to appeal to our HFASD persons' penchant for eating and food preparation.

Objectives: To examine whether executive functioning strategies could be incorporated into an group protocol to improve daily living skills of adolescents/adults with high functioning autism.

Methods: 110 adolescents/adults with HFASD were randomized to an 8-week treatment group or waitlist, and eventually the waitlisted group also completed the protocol. Each treatment session is structured to include all three skills that contain executive function elements of planning, time management and attention.

Results: Analyses of goal attainment scales of each DLS comparing both groups did not yield significant result. However, entire samples analyses demonstrated some gain in grocery shopping and preparing/cooking a dish, but not in cleansing cooking equipment/environment.

Conclusions: Current results provide some evidence that DLS can be improved, but aspects of DLS to be included in protocol and measurement to assess change in DLS can be examined further to improve the efficacy of the protocol.

408.040 Communication Training Using a Social Avatar for Young Adults with Autism Spectrum Disorders

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Background:

Young adults with autism spectrum disorders (ASD) face challenges in social interactions. They actively avoid social encounters which is associated with poor social communication and functioning. Social communication intervention approaches are effective when involving motivational activities and settings. In addition, enhanced self-confidence is important for addressing target situations and promoting social participation.

A growing body of literature suggests that young adults with ASD exhibit intrinsic motivation to operate teleoperated technological systems. To improve social participation, we developed a communication training system that uses social avatar (CSA). In CSA, social anxiety in young adults with ASD is expected to decrease, because they are not in the same physical space as unfamiliar people, they are not subjected to direct eye contact. Notably, even if they have an embarrassing experience, their self-esteem is less likely to be hurt because they are not observed by others.

Objectives:

The objective of this study was to assess the feasibility using CSA for young adults with ASD.

Methods:

Nine young adults with ASD participated in this study. The tele-operated social avatar used in this study was "Gene" (Figure 1; Lee Lab., NITech). A personal computer was placed in front of the user. In this setup, when the operator spoke through a microphone that was connected to the PC, the "Gene," repeated the words. The user's voice was converted using a voice-conversion system to match the avatar's appearance. Additionally, there was a motion-capturing system, so "Gene" reflected the user's gestures. In this study, users stayed in a familiar place with tele-operated "Gene" which is located in city streets to communicate with an unfamiliar person. There was a professional coach near the users who guided them on how to communicate with others and gave feedback on their communication. Subsequent trial procedures were conducted on days 1–5. Questionnaires (i.e., motivation, self-confidence, social anxiety, and comprehension of the perspective of others) were scored on a 7-point Likert scale. The ratings for communication performance ranged from 1 (very poor) to 7 (very excellent).

Results:

There was a significant increase in motivation and comprehension of the perspective of others, and a trend of increase in self-confidence and social anxiety to speak with unfamiliar people on day 6 (motivation; 5.33 ± 1.50 , comprehension of the perspective of others; 6.11 ± 1.05 , self-confidence; 3.44 ± 2.19 , social anxiety; 3.78 ± 2.05) compared to day 1 (motivation: 3.11 ± 1.36 , comprehension of the perspective of others; 3.56 ± 1.59 , self-confidence; 4.56 ± 2.40 , social anxiety; 5.22 ± 1.79) (motivation: $p < 0.01$, comprehension of the perspective of others; $p = 0.01$, self-confidence; $p = 0.08$, social anxiety; $p = 0.76$). As expected, motivation for training using this system was maintained during the session.

Conclusions:

This study evaluated the effectiveness of operating an avatar in young adults with ASD. Our program improved self-confidence and comprehension of the perspective of others in them. Further longitudinal studies with larger and more diverse samples of young adults with ASD are warranted to draw definitive conclusions regarding the effectiveness of CSA.

**408.041 Comprehensive Framework for Understanding Employment Barriers and Facilitators**

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Background: A key research priority identified by the autism community is to understand ways to support autistic people to gain and sustain meaningful employment. In addition to examining facilitators of meaningful employment for autistic adults, it is crucial to find solutions to employment barriers. Our research aims to capture a comprehensive range of factors that contribute to improving employment outcomes for autistic adults.

Objectives: Using qualitative interviews, we will examine barriers and facilitators to meaningful work experiences among autistic adults.

Methods: Current analysis presents qualitative data collected at the second timepoint of an ongoing longitudinal study examining employment and education stability in autistic adults. Participants in this analysis included 80 autistic adults (58 biological males) between the ages of 18–45 ($M=31.52$), and 73 informants (51 mothers). Autistic adults were asked open-ended questions to describe workplace successes and challenges within the last six months with follow-up questions asking about strengths, difficulties and external supports while probing specifically for employment experiences. Informants who know the autistic adult well (e.g., parent, spouse, or friend) also were asked to report on the autistic adult's workplace successes and challenges. Interviews were audio recorded and responses were transcribed verbatim. Transcriptions were checked and verified for accuracy before coding.

Data coding and analysis was conducted by following the COREQ guidelines, an evidence-based qualitative methodology. A hierarchical coding system was developed and refined using a preliminary review of the transcripts. Coders established reliability using the coding system on one transcript. Coding was compared and discrepancies resolved through reconciliation. Remaining transcripts were independently coded by adult and informant dyads to consider each adult within their context. We used an iterative inductive/deductive approach to the qualitative data analysis. Deductively, the conceptual framework was informed by social ecological theory. Inductively, we used coded quotes to identify higher order themes and relationships between themes.

Results: Results of qualitative analysis suggested a multidimensional model of contributors to employment experiences (Figure 1). Emerging themes that influenced employment consisted of persistence, self-awareness, self-efficacy, coping, motivators, and expectations. The impact of these contributors to employment differed across context and were modified by mental health supports and involvement of family. Other workplace factors such as job settings, job characteristics, and employment logistics were commonly mentioned as affecting engagement in employment.

Conclusions: This study identified several individual strengths and challenges that contribute to employment experiences. Findings highlight mental health supports and family involvement as critical influences on employment outcomes for autistic individuals. This framework can help guide and inform future research and practice. Employers can benefit from implementing individualized workplace accommodations/adjustments that leverage adults' unique strengths and support their vulnerabilities. Researchers can benefit from having an organizing framework from which to consider the many factors that contribute to meaningful employment experiences.



408.043 Deception Detection in Neurodiverse Young Adults

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Background: Previous research suggests autistic individuals are susceptible to manipulation through lying and deception (Cooke et al., 2024; Kostin, 2022; Williams et al., 2018). This vulnerability can manifest in real-world situations causing difficulties for autistic individuals. Yet, the current literature investigating deception in autism does not directly address autistic individuals' ability to detect lies, instead, focuses on their ability to deceive others or pass false-belief tasks.

Objectives: The main objective of this study is to investigate the relationships between self-reported autism symptoms and executive functioning (EF) skills with deception detection performance across contrasting demeanor-based conditions in neurodiverse young adults.

Methods: Seventy-seven participants (ages 18 – 28 years) completed self-reported ratings of autism symptoms (i.e., Autism Spectrum Quotient, AQ; Social Responsiveness Scale, SRS-2), EF (i.e., The Behavior Rating Inventory of Executive Function for Adults, BRIEF-A), and a computerized deception detection task in which participants watched video interviews and judged whether the subjects were telling the truth or lying. Interviews represented matched (sincere truth-tellers and insincere liars) and mismatched (insincere truth-tellers and sincere liars) conditions. Two hierarchical regression analyses were conducted to examine the relationship between autism symptoms and deception task accuracy. A moderation analysis tested whether levels of EF moderated the relationship between AQ and deception task accuracy.

Results: In the matched condition, age, gender, and FSIQ were entered in step 1 and did not significantly predict accuracy rates ($F(3,73) = 0.69$, $p = 0.56$). The inclusion of SRS-2 Total T-scores and AQ Total score in Step 2 did not account for significant variance ($\Delta R^2 = .06$, $p = 0.12$). In the mismatched condition, Step 1 with age, gender, and FSIQ did not predict accuracy rates ($F(3,73) = 1.32$, $p = 0.28$). When AQ Total score and SRS-2 Total T-scores were added in Step 2, AQ emerged as a significant predictor, with higher AQ scores associated with increased accuracy ($\beta = .59$, $p = .002$) explaining an additional 16% of the variance ($\Delta R^2 = .16$). The BRIEF-A GEC scores significantly moderated the association between AQ and mismatched condition accuracy. Slopes were significantly different from zero at both low ($b = 1.29$, $t = 4.89$, $p < .001$) and high ($b = 0.58$, $t = 2.3$, $p = .03$) BRIEF-A GEC scores. At lower BRIEF-A GEC scores, the AQ- accuracy relationship was stronger; but at higher BRIEF-A GEC scores, the relationship was weaker, though significant.

Conclusions: The current findings suggest that when social cues and verbal content were congruent, greater autism symptoms did not provide an advantage or disadvantage in detecting deception. Conversely, those with greater autism symptoms were unlikely to be deceived by the senders' social cues, benefitting them in detecting deception when such cues were misleading. In participants with better self-rated EF, as autism symptoms increased, mismatched condition accuracy also increased. For participants with poorer self-rated EF skills, the positive relationship between autism symptoms and accuracy was still present although weaker, suggesting that some participants may leverage their EF abilities to perform well in the task despite their higher autism symptoms.

408.044 Depression Subtypes in Autism Spectrum Disorders

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Background:

Major depression disorder (MDD) episode is defined by a complex set of symptoms and signs, ranging from depressed mood and anhedonia to loss of appetite and poor sleep. It has been estimated that patients can satisfy the criteria for MDD in at least 227 different ways. Therefore, psychiatrists have more recently focused on better defining clinical subtypes of MDD in order to provide a more personalized treatment. Despite the relative abundance of data on the prevalence of depression in autism spectrum disorders (ASD), little is known about clinical subtypes of depression in this condition.

Objectives: The present study aims to evaluate MDD phenotypes in a cohort of autistic adults.

Methods:

We consecutively enrolled 53 autistic individuals who were also referred to our centre for major depression disorder (MDD). All subjects were evaluated by a senior psychiatrist with wide expertise in ASD according to DSM 5 criteria. Depression subtypes were described according to CANMAT guidelines; specifically, we used the following dimension: with anxious distress, with atypical features, with catatonic features, with melancholic features, with psychotic features, with seasonal pattern, with mixed features, with cognitive dysfunction, with sleep disturbances and with somatic symptoms. Additionally, we evaluate the presence of treatment-resistant depression defined as depression not responding to a least two different antidepressants at the maximum dosage for an adequate amount of time.

Results:

in 5.6% of subjects, MDD was not confirmed. Age range of the sample was 19-65 years. All the sample presented sleep disturbances. Most of our autistic adults (53%) present either with MDD with anxious distress or with atypical features, the latter having irritability as the main mood symptom. Nearly 23% have depression with melancholic features. 8% of the sample have treatment-resistant MDD. 8% of the sample have MDD with psychotic symptoms (all were males).

Conclusions: our data on clinical subtypes of MDD in ASD showed significant differences compared to MDD in the neurotypical population: as an example, treatment-resistant MDD has more than double prevalence compared to the general population. Identifying clinical subtypes of depression in ASD is important to provide the clinicians with more data for differential diagnosis. Additionally, it could be essential for the choice of treatment, in order to reduce mistreatment and lack of response.

408.046 Differences in Subjective Sensory Gating and Interoceptive Awareness in Autistic Adults

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Background: Autism is a heterogeneous neurodevelopmental condition strongly linked to differences in sensory processing, including overall heightened exteroceptive experiences and mixed findings on interoceptive awareness. However, scant research exists which simultaneously assess subjective exteroceptive sensory gating and interoceptive awareness in autism, especially in adulthood. Importantly, subjective interpretations of these sensory-based experiences have far-reaching impacts for one's quality of life, via attention, decision making, and even emotional and social functioning. Thus, investigations into how subjective experiences of these processes may be altered in autistic adults may lend new insights to inform novel mechanistic research.

Objectives: The current study investigated group differences in subjective experiences of exteroceptive sensory gating and interoceptive awareness in autistic adults (AU) and neurotypical controls (NT), plus tested the associations with self-reported autistic traits. We hypothesized increased self-reported exteroceptive sensory gating difficulties and broad differences in interoceptive awareness in AU compared to NT. We also hypothesized that deviations would relate to elevated self-reported autistic traits.

Methods: 59 AU ($M=23.03$ years, 86% White, 44% male) and 44 NT ($M=22.80$ years, 68% White, 52% male) adults completed the Sensory Gating Inventory (SGI) and the Multidimensional Assessment of Interoceptive Awareness-2 (MAIA-2) surveys. AU additionally completed the Autism Spectrum Quotient-Full (AQ) to assess level of overall self-reported autistic traits across a variety of domains. Analyses employed t-tests to evaluate group differences. MAIA-2 scales demonstrating differences were tested for within-group correlations with SGI. Follow-up correlations tested associations with autistic traits in AU.

Results: Compared to NT, AU reported greater sensory gating impairments on all SGI subscales ($t=8.42-12.01$, $ps<0.001$); AU also reported lower tendencies to trust interoceptive sensations ($t=-5.75$, $p<0.001$), to not being distracted by ($t=-3.39$, $p=0.001$) and to not worry about ($t=-3.73$, $p<0.001$) them, plus lower tendencies to control attention to interoceptive sensations ($t=-3.73$, $p<0.001$) or to use them to self-regulate ($t=-4.08$, $p<0.001$). In the AU group there was a negative relationship between greater sensory gating impairments and the tendency to not be distracted by interoceptive sensations ($r=-0.37$, $p<0.01$). Finally, self-reported autistic traits were positively associated with greater sensory gating impairments ($r=0.36$, $p<0.01$), while they were negatively associated with tendencies to control attention to interoceptive sensations ($r=-0.30$, $p<0.05$) and using them to self-regulate ($r=-0.27$, $p<0.05$). These last two relationships with AQ were not explained by sensory gating impairments or co-occurring psychopathology.

Conclusions: Adults with autism show pervasive disturbances in subjective exteroceptive sensory gating and interoceptive processing, which were mutually related and also associated with overall self-reported autism phenotype. Findings extend existing literature and highlight the need for future research to investigate how this relationship between exteroceptive and interoceptive difficulties in autism is relevant to treatment and neurobiological mechanisms.

408.047 Disease and Mortality Trajectories of Autistic Individuals in Mid- and Later- Adulthood

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Background:

An increasing number of autistic adults have entered their later life, but little is known about the disease trajectory in mid- and later adulthood.

Objectives: We aimed to examine the patterns of comorbidity progression in adults with autism spectrum disorder (ASD) that may affect their mortality.

Methods:

Participants were identified from the UK Biobank study. We first identified individuals with ASD diagnosis, each of whom were randomly matched to up to 10 participants without ASD diagnosis. Cox regression was used to estimate the hazard ratio (HR) of mortality. Disease trajectory analysis was performed to investigate temporal sequencing of medical conditions and mortality associated with ASD. A multistate model was used to investigate the association patterns between ASD and three common chronic conditions: cardiovascular disease, type 2 diabetes, and mental health problems.

Results:

The study included 659 ASD cases (66.8% male; mean age 52.0 [SD, 8.1]) and 6,590 matched non-autistic individuals. ASD were associated with a 90% higher all-cause mortality (HR, 1.90, 95% CI, 1.41-2.55) and also higher risks of 45 medical conditions across almost all body systems (all Bonferroni-adjusted $P<0.05$). Trajectory analyses exhibited three clusters of medical conditions that predisposed autistic adults to excess mortality: cardiometabolic diseases, external conditions, and infectious diseases. Autistic adults showed not only an overall increased risk of progression of multimorbidity but also distinctive association patterns across different disease transitions.

Conclusions:

Our findings show patterns of comorbidities among autistic adults in their mid- and later adulthood, which could provide information to their caregivers to implement appropriate disease management and prevention strategies.



408.048 Institutional and Social Stigma during School Trajectories and Its Impact on Labor Inclusion: A Women's and Non-Binary Autistic Adults' Perspective.

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Background:

Despite increasing awareness of neurodiversity, the intersection of autism and gender remains underexplored, particularly in relation to how students' experiences shape labor inclusion. In Chile, autistic individuals continue to face significant barriers to both educational and professional inclusion. It is essential to examine the stigmatizing processes encountered by autistic women and non-binary autistic adults, and their long-term consequences.

Objectives:

This study aims to analyze the institutional and social stigma experienced by autistic women and non-binary autistic adults during their educational trajectories and its impact on labor inclusion. Specifically, it seeks to understand how experiences of violence and discrimination within the educational context influence job opportunities for young autistic women and non-binary individuals in Chile.

Methods:

A qualitative approach was employed, conducting 16 in-depth interviews with cisgender autistic women (n=14) and non-binary individuals (n=2) from Chile. All the collected data was digitized and transcribed, creating a unique data corpus. An open coding process was used to assign meaning units to the information and construct thematic categories. The interviews were coded and analyzed to identify elements related to the transition from school to work, focusing mainly on institutional and social stigma. The study received ethical approval from an Accredited Ethics Committee.

Results:

The analysis revealed institutional and social stigma during the participants' educational trajectories, which negatively impacted their labor inclusion. Participants reported **discriminatory attitudes** from teachers, school professionals, and peers. One participant described how a teacher bullied her for appearing to fit a particular stereotype: *"A teacher bullied me for looking like Sheldon Cooper"* (DS07). Additionally, some educational professionals contributed to the participants' social isolation. For example, a participant recounted how a school psychologist blamed her for her loneliness: *"The psychologist said I was to blame for being alone"* (BS06).

Discriminatory attitudes also extended to peers, with participants reporting bullying that intensified their feelings of isolation: *"My classmates bullied me"* (DS04). These experiences of social exclusion and institutional violence directly affected the participants' **self-esteem** and their ability to integrate into the labor market. One participant expressed the internalized self-doubt fostered by such experiences: *"I've always struggled with self-esteem, and I feel like I'm not capable"* (DS01).

In the workplace, participants noted that **autistic traits** are often misunderstood, complicating their inclusion: *"These characteristics of autistic women are the same ones that cause conflict at work"* (MG04). Moreover, stereotypes about autism were also present in the school context, where participants were labeled as loners or incapable: *"She's autistic, she likes being alone, she doesn't talk much"* (DS04).

Conclusions:

This study highlights the profound and lasting impact of institutional and social stigma experienced by autistic women and non-binary autistic adults during their educational trajectories. Discriminatory attitudes and inadequate teaching practices not only perpetuate cycles of exclusion and violence but also limit opportunities for labor inclusion. The findings suggest the need for public policy interventions and educational programs that address stigma and promote inclusive practices in educational and labor environments.



408.049 Effects of Low-Dose Psilocybin on EEG-Derived Neural Complexity in Autistic and Non-Autistic Adults

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Background: Psilocybin is a partial serotonin agonist, primarily affecting the 5-HT_{2A} receptors, with smaller effects on 5-HT_{1A} and 5-HT_{2C} receptors. Psychedelic doses of psilocybin have been found to significantly increase EEG-derived measures of neural complexity. This increase in complexity is thought to reflect a more flexible, dynamic brain state, where rigid patterns of neural activity are temporarily disrupted. However, existing studies have focussed on large, psychedelic doses in neurotypical subjects, limiting broader therapeutic potential. It is unclear whether low doses of psilocybin, which do not produce marked psychedelic experience, can also increase neural complexity, and whether its effects could extend to autistic people with different baseline serotonergic function.

Objectives: Here we used two low (sub-psychedelic) doses of psilocybin, to examine whether EEG markers of neural complexity could be modulated in non-autistic people, and whether modulation is different in autism. Two types of EEG complexity measures were considered: Lempel-ziv complexity (LZc) and Detrended Fluctuation Analysis (DFA).

Methods: EEG data were recorded at rest in 67 adults with (37) and without (30) autism. Data were collected as 6 blocks of 1-minute trials where participants eyes were either open (3 trials) or closed (3 trials). All data were collected following a single dose of either placebo, 2mg of psilocybin or 5mg of psilocybin. The order of which was randomised and double blind. Data were pre-processed using the MADE-BOND automated pipeline in EEGLAB. Key steps included downsampling to 250Hz, bandpass filtering (1-35Hz), removal of flat/noisy channels, ICA for artifact removal (blinks, saccades, EMG), channel interpolation, and re-referencing to the average.

Results: We hypothesise that psilocybin will increase neural complexity (LZc and DFA) with increasing dose of psilocybin in non-autistic people. There are no previous studies reporting psilocybin pharmacological challenges in autistic participants; but consistent with response to other psychoactive drugs, we expect autistic participants to respond distinctively to psilocybin (either an increased or reduced response) in comparison with non-autistic participants.

Conclusions: For the first time, we will present findings on the modulation of neural complexity by low-dose psilocybin in both autistic and non-autistic adults. By comparing these groups, we aim to determine whether psilocybin's effects can be achieved at sub-psychedelic doses, focusing on autistic adults, who may exhibit distinct responses due to differences in serotonergic function. The findings will clarify whether lower, safer doses of psilocybin hold therapeutic potential, especially for autistic people.

408.050 Elevating Resilience Among Autistic Post-Transfer College Students

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Background: Navigating new institutional spaces, college students in the United States enrolled in a four-year college or university following community college transfer are confronted with a bevy of unfamiliar experiences (Chin-Newman & Shaw, 2013; Rodriguez & Kerrigan, 2019). Transferring from a two-year college to a four-year college can be challenging for any student, prompting transfer shock (Lakin & Elliott, 2016; Scott et al., 2017) and negatively impacting their mental health (Daltry & Mehr, 2016; Mikell & Davis, 2022). However, it is unclear whether/how the distinct cognitive and behavioral profiles common to autism might affect that transition process.

Objectives: Current understandings of autistic college students' experiences generally do not disaggregate based on pre- or post-transfer status (for exceptions, see Anyinam et al., 2020). With the ultimate goal of facilitating autistic students' postsecondary success, this study explores how autistic students maintain resilience and honor self-care as they transition from a two-year to a four-year college.

Methods: This study draws on data from 21 interviewees identifying as transfer students, conducted as part of a nationwide, mixed methods, longitudinal study on autistic college student success. To ease students' comfort, we allowed them to choose the interview format (Zoom video, audio, or chat only) and shared interview protocols in advance. Our team conducted member checking through having participants review summaries of our conversations to share edits and clarify any points (Lincoln & Guba, 1985). Our research team of individuals with distinct autism expertise and connections developed an initial codebook of theoretical codes (Saldaña, 2016) related to our Identities, Psychological, Academics, Community, and Employment (IPACE) framework. We developed an initial codebook augmented by emergent codes. We extracted codes connected to issues around mental health, well-being, and executive functioning.

Results: We identified three themes that helped students maintain resilience and honor self-care. First, students leveraged college services that reduced their stress and anxiety, from counseling and disability services offices, to autism support programs and disability alliances. Second, they turned to people who provided support and reassurance, including faculty who validated their concerns and peers who they could rely on for friendship. Third, they practiced patience with themselves amid stressful times. For example, one student shared, "amidst it all, the grass still grows and I still smile. So, basically like no matter what is thrown my way, life still goes on." Student anecdotes elucidate the value of leaning into resources, other people, and their own self-worth in feeling resilient and supporting their mental health.

Conclusions: Our study illuminates that post-transfer students often encounter disorienting environments when moving from a two- to a four-year college. Although it may be impossible to entirely avoid such experiences, students report having employed multiple strategies to facilitate a successful transition. By making use of institutional resources, cultivating supportive relationships with instructors and peers, and practicing patience with themselves and others, autistic transfer students can maximize their likelihood of attaining their definitions of college success.

408.051 Emerging Adulthood Transitions and Support Networks within the Context of Autism

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Background: Research on autistic transition-aged young adults (TAYA) has primarily focused on objective markers of adulthood, such as residential placement and employment, with limited attention given to the interrelationships between caregivers and their adult children. Additionally, much of the existing literature does not disaggregate by socioeconomic status. There is also a need for studies drawn from recent cohorts of TAYA that are reflective of more recent demographic changes or the evolving autism diagnostic criteria.

Objectives: The study's objective was to describe family support, public assistance support, indicators of adulthood, and health among TAYA. We compared those with an autism diagnosis to those without to inform future practice and policy.

Methods: We used the most recent wave (Year 22) of the Future of Families and Child Wellbeing data, a national, longitudinal sample of children born in cities in 1998-2000. Seventy-five percent of FFCWS children were born to parents unmarried at the time of their birth resulting in a sample with high levels of socioeconomic disadvantage. Mothers, fathers and caregivers were asked about FFCWS children with disabilities at key developmental points including at Years 1, 3, 5, 9, and 15. Young adults also did so at Year 22. The present analysis examines differences between young adults with an autism diagnosis at some point from age 3 to age 22 ($n = 69$) to those without an autism diagnosis at any point ($n = 2,114$).

Results: Autistic TAYA were more likely to live with their parents at age 22 (70% vs. 54%), but these arrangements did not translate to closer relationships. Those with autism reported similar levels of talking with, seeing, and feeling extra close to their parents as those without autism. Autistic TAYA were more likely to receive public assistance benefits, largely due to Social Security Income (SSI) receipt without differences on other cash or food benefits or socioeconomic indicators (e.g., poverty level, experiencing a hardship). Despite similar socioeconomic conditions, autistic TAYA were much less likely to achieve all measured indicators of adulthood including full-time employment (16% vs. 38%), full responsibility for bills (31% vs. 56%), marriage or partnership (17% vs. 38%), or parenthood (16% vs. 5%). Autistic TAYA also experienced lower levels of life satisfaction and self-reported health and higher rates of anxiety when compared to their counterparts without an autism diagnosis.

Conclusions: Findings suggest that the public safety net protects autistic TAYA from poor socioeconomic conditions, yet this protection does not extend to key well-being indicators. Lower levels of life satisfaction, health, and mental health may reflect autistic TAYA's lower likelihood of reaching traditional markers of adulthood. Their higher likelihood of living with their parents, for example, may reflect the lack of alternatives rather than preference as their level of contact and closeness to their parents is similar to those without autism. Public programs to support autistic TAYA transition to young adulthood may help to alleviate well-being disparities.

408.052 Examining Gender-Based Differences in Dating Experiences and Romantic Relationships Among Autistic Adults

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Background:

Autistic individuals often face challenges when it comes to dating, romantic relationships, and sexuality (Barnett & Maticka-Tyndale, 2015; Cheak-Zamora et al., 2019). These challenges may stem from differences in pragmatic communication skills and challenges with recognizing and responding to social cues and emotions that are associated with autism (Kohn et al., 2022; Kock et al., 2019). Gender differences in the prevalence, presentation, and experiences of autism are well-documented (Cooper et al., 2018; Milner et al., 2019). For example, higher rates of camouflaging, late-in-life diagnoses, and mental health challenges have been observed in autistic women (DaWalt et al., 2021; Zener, 2019). These factors, combined with well-established differences in dating experiences between men and women in the general population, highlight the need to better understand gender-based differences in the dating experiences of autistic adults (Kock et al., 2019; Martinez et al., 2021). Such research is essential to developing adequate support strategies that address the needs of this population.

Objectives:

This study aims to investigate gender differences in the romantic and dating experiences of autistic adults.

Methods:

Participants included 90 autistic adults (males, $n=75$; females, $n=15$) enrolled in a study investigating a novel social skills program focused on dating etiquette and developing healthy romantic relationships, PEERS® for Dating ($M_{age}=26.11$, $SD=5.74$). At baseline, adults reported on their dating history and completed measures such as the Social and Emotional Loneliness Scale for Adults (DiTommaso & Spinner, 1993), Dating Anxiety Scale (Glickman & La Greca, 2004), and a criterion-based measure of dating-related social skills taught in the curriculum, the Test of Dating Skills. Independent samples t-tests and chi-square analyses were conducted compare constructs by gender.

Results:

Independent samples t-tests indicated no significant gender differences in total dates in the past month $p=.189$, knowledge of dating-related social skills, $p=.268$, loneliness, $p=.234$, or dating anxiety, $p=.151$. Crosstabulation analysis indicated a trending relationship between gender and recent use of online dating platforms, with males marginally more likely to endorse usage, $\chi^2(2, N = 90)=3.31$, $p=.069$. Further, a significant relationship between gender and previous dating experiences emerged, $\chi^2(2, N = 94)=7.49$, $p=.024$. Specifically, autistic males were more likely to have had no previous dating experiences (53% of males, 29% of females), while autistic females were more likely to have had experiences with committed relationships (17% of males, 47% of females) prior to the start of the program.

Conclusions:

Results suggest that while male and female autistic adults have similar levels of loneliness, dating skills knowledge and dating anxiety, autistic men have less dating experience than autistic women. This may explain why autistic men were somewhat more likely to be engaging with online dating platforms. Given that autistic women are more likely to experience intimate partner violence (Douglas & Sedgewick, 2024), future research may explore factors associated with positive dating experiences to inform clinical supports for this vulnerable group. Additionally, investigating the dating and romantic experiences of gender-diverse autistic adults should be considered given the high prevalence of gender diversity in the autistic community (Strang et al., 2023).

408.053 Experiences of Autistic Adults Using Psychedelic Drugs Including Adverse Effects

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Background: Research into managing social and emotional issues is a high priority in the autistic community. Recently, classic psychedelics have emerged as potential therapies for various mental health conditions. Anecdotal evidence suggests psychedelics may increase psychological well-being and social engagement in autistic people. However, there are few modern studies investigating this area.

Objectives: This exploratory study aims to investigate the experiences of autistic participants with psychedelics, particularly the extent to which they attribute changes in mental health and social engagement to their most 'impactful' psychedelic experience. We also examine associations between these changes and relevant variables, such as aspects of the acute psychedelic experience and changes in psychological flexibility.

Methods: Self-selecting autistic participants with high autism quotient scores ($n=233$), completed an online survey regarding their most impactful psychedelic experience. The largest demographic represented in our survey were well-educated men from North America or Europe (total sample mean age = 29.8 years, 48.7% identified as men, 23.7% identified as women, 21.1% identified as non-binary and 6.5% identified as other).

Questionnaires assessed the acute psychedelic experience and perceived psychedelic-induced changes in distress, social engagement, psychological flexibility, and other relevant constructs. We performed two exploratory linear regressions with change in psychological distress and social engagement as dependent variables. We controlled for age, years of education, gender identity and time since psychedelic experience, to explore the association between the dependent variables and changes in relevant constructs (e.g. loneliness, camouflaging, social connectedness, autistic characteristics and intensity of the acute psychedelic experience).

Results: Most participants attributed decreases in psychological distress (82%) and social anxiety (78%) and increases in social engagement (70%) to their selected psychedelic experience. A notable minority reported negative effects, including heightened anxiety (20%), with some describing their psychedelic experience as among the most negatively impactful of their lives. The only substantial predictor for reductions in psychological distress was increased psychological flexibility. We also present additional unpublished data regarding participants who reported decreased well-being, including autism quotient scores, relevant camouflaging subscale scores and measures of psychedelic 'integration'. We also present further unpublished data on the participants' mindsets preceding these experiences and the settings in which they occurred. We also reference an unpublished systematic review of adverse effects in 32 modern, randomised and placebo-controlled studies where psilocybin was administered to humans (a chapter of Jack Stroud's University College London (UCL) Doctoral Thesis), which provides results and recommendations relevant to future studies with autistic participants.

Conclusions: Participants in our study attributed changes in mental health and social engagement to a single impactful psychedelic experience.

While these findings are promising, they must be interpreted cautiously due to the non-experimental design and biased sampling. The results justify small proof-of-concept intervention trials to evaluate the feasibility and acceptability of psychedelic interventions for enhancing well-being in autistic individuals. Such studies should also consider the possibility of increased vulnerability to adverse effects in this population and implement careful design and monitoring to manage and assess these risks.

408.054 Experiences of Autistic Connectedness in a Virtual Group-Based Mindfulness Intervention: A Qualitative Analysis

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Background: Autistic connectedness, defined as having a sense of belonging and shared experiences within the autistic community, being socially connected to other autistic people, and advocating for this community (Botha et al., 2022), has been shown to be linked with increased well-being, belonging, and resilience (Cage et al., 2022; Cooper et al., 2017; Crompton et al., 2020; Robeyns, 2016). Studies have commonly examined connectedness within the context of interventions that directly target improvements in social skills and communication. Fewer studies have investigated how connectedness can be fostered among autistic adults in more naturalistic ways. Mindfulness interventions may be uniquely poised to indirectly enrich aspects of autistic connectedness, as these interventions are grounded in principles of compassion, non-judgment, and present-moment awareness, which may, in turn, enable the development of more meaningful and accepting relationships (Block-Lerner et al., 2007; Birnie et al., 2010; Hutcherson et al., 2008; Welwood, 1996). It is warranted to examine whether this type of intervention may cultivate improvements in autistic connectedness when delivered using a neurodiversity-affirming approach.

Objectives: The current study qualitatively explored the impacts of an autistic co-designed and co-led virtual mindfulness intervention on experiences of connectedness among autistic adults.

Methods: Participants were recruited from agencies across Canada that provide services to autistic people and their families, in addition to recruitment conducted through social media (e.g., Twitter, Facebook). Sixty-three participants completed a virtually delivered six-week mindfulness intervention between November 2022 and July 2023, as part of a randomized controlled trial. Fifty-seven participants completed open-ended survey responses following the intervention. Open-ended questions queried what participants liked most and least about the group, their impressions of having an autistic person co-lead the group, and their impressions of participating with other autistic adults in the group. Participants were between 19 to 68 years of age ($M = 37.41$ years, $SD = 11.26$ years). Fifty-four percent of participants identified as women, 31% as men, and 25% as gender diverse (e.g., non-binary, gender nonconforming).

Results: A structured approach to thematic analysis (ST-TA; Robinson, 2022) revealed that autistic connectedness was reflected in overall themes of *safety*, *acceptance*, and *belonging*. With regard to safety, participants expressed that having an autistic person co-facilitate the group allowed them to trust in the group and feel reassured and comforted. Acceptance was related to participants feeling supported by fellow group members and facilitators and being able to be their authentic selves. Finally, belonging was linked with participants feeling a sense of community in the group, sharing and learning from others' challenges, and feeling represented. Notably, some participants expressed negative impacts of participating within the group (i.e., increased feelings of anxiety and masking behaviours), and others indicated a greater need for opportunities to connect with like-minded individuals.

Conclusions: Understanding naturalistic ways in which autistic connectedness can be nurtured is vital to promoting positive outcomes among autistic adults. Future research should explore both intervention-specific (e.g., mindfulness-related values of acceptance and non-judgment) and broad factors (e.g., connecting within a neurodiversity-affirming, shared space) that may facilitate increased connectedness among this group.



408.055 Experiential and Psychophysiological Emotional Coherence in Daily Life in Autistic Adults

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Background: While studies predicting emotional experience from physiological signals often assume that the different components of emotion (e.g., experience, psychophysiology, behavior) change coherently, the existence of emotional coherence remains controversial. This issue is particularly relevant in autistic individuals, given the high prevalence of alexithymia (i.e., difficulties in experiencing, identifying and expressing emotions). Therefore, this study aims to examine emotional coherence in autistic adults' daily life and test whether autism diagnosis or alexithymia symptoms moderate this coherence.

Objectives: We aim to: (1) examine the presence of emotional coherence, defined as the within-individual association between experiential (self-reported arousal) and physiological (heart rate [HR] and skin conductance level [SCL]) components of emotion, in everyday life; (2) determine whether autism diagnosis or trait alexithymia symptoms moderate emotional coherence; and (3) explore the specific temporal scale at which the physiological and experiential components of emotion achieve the strongest coherence.

Methods: Data were drawn from an ongoing project involving 65 adults (50 autistic adults and 15 neurotypical controls, age = 32.50 ± 10.58 years, 46/16 assigned female/male at birth) who completed a 14-day ecological momentary assessment (EMA) and ambulatory psychophysiological monitoring. Before the EMA assessment, participants completed the Toronto Alexithymia Scale (TAS-20) to assess trait alexithymia symptoms. During each data collection day, participants received 8 prompts over their waking hours (at least 12 hours) to report current emotional arousal levels, while wearing electrocardiogram (ECG) and electrodermal (EDA) sensors to measure HR and SCL. Mixed-effects models assessed the within-individual associations between emotional arousal and HR/SCL metrics derived from the 30-minute period preceding each prompt. We also examined the potential moderation effects of autism diagnosis and trait alexithymia and explored the optimal time window (ranging from 5 to 60 minutes) for HR and SCL metrics to achieve the strongest emotional coherence.

Results: Significant emotional coherence was observed, with increased emotional arousal associated with increased HR ($\beta = 0.46$, $SE = 0.06$, $p < .001$) and SCL ($\beta = 0.30$, $SE = 0.06$, $p < .001$). These associations were not significantly moderated by autism diagnosis (HR*autism: $\beta = 0.23$, $SE = 0.13$, $p = .09$; SCL*autism: $\beta = 0.00$, $SE = 0.16$, $p = .99$) or trait alexithymia symptoms (HR*alexithymia: $\beta = 0.00$, $SE = 0.00$, $p = .23$; SCL*alexithymia: $\beta = 0.00$, $SE = 0.01$, $p = .33$). Additionally, HR and SCL derived from shorter time windows demonstrated better predictive fit for emotional arousal, with the 5-minute window yielding the best performance, although optimal time windows varied across individuals.

Conclusions: These preliminary results provide the first evidence that emotional coherence exists in both autistic and neurotypical adults in everyday life, with stronger physiological responses (HR and SCL) associated with higher emotional arousal. Contrary to expectations, autism diagnosis and alexithymia symptoms did not significantly moderate emotional coherence, suggesting that coherence may not be as disrupted by autistic traits as previously thought. However, our tests of moderation may be underpowered and data collection is still ongoing. The findings also highlight the importance of time window selection when examining emotional-physiological associations.

408.056 Exploring Determinants of Physical Activity in Adults with Intellectual and Developmental Disabilities

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Background: Physical activity is important for maintaining overall health and well-being, as it has been shown to reduce the risk of noncommunicable diseases such as cardiovascular diseases, diabetes, and obesity. However, in adults with intellectual and developmental disabilities (IDD), participation in physical activities is significantly lower compared to the general population. The consequence of this reduced participation is an increased risk of health issues, including lower physical fitness levels, higher rates of obesity, and a decreased quality of life. Understanding the processes that contribute to engagement in physical activity in this population is crucial for developing effective interventions. **Objectives:** To qualitatively explore determinants of engagement in physical activities for adults with intellectual and developmental disabilities. **Methods:** Four focus groups of caregivers ($n = 16$), three focus groups of direct support professionals (DSPs; $n = 14$), two focus groups of exercise professionals ($n = 12$), and individual interviews with adults with IDD ($n = 15$) from racially and ethnically diverse backgrounds participated in semi-structured interviews to share their perspectives on physical activity engagement for adults with IDD. Data from the interviews and focus groups were systematically coded and analyzed using applied thematic analysis stratified by participant type.

Results: Participation in physical activities for adults with IDD is influenced by several factors. All participants, including adults with IDD, caregivers, DSPs, and exercise professionals, emphasized the importance of physical activity for quality of life. Adults with IDD mentioned physical activity in terms of enjoyment, extrinsic motivation, and social opportunities. Caregivers, DSPs, and exercise professionals highlighted challenges for adults with IDD in setting abstract goals, relying more on short-term goals with tangible outcomes. For example, adults with IDD were more motivated by rewards than overall health benefits for physical activity. These challenges affected their engagement in goal setting and progress monitoring for physical activity. The lack of resources to convey long-term benefits was a key issue. Other challenges included logistics, lack of services, and resources. Personalized programs and inclusiveness were seen as crucial for encouraging physical activity. Tailored programs and inclusiveness were considered more effective for long-term engagement.

Conclusions: This study highlights the multifaceted nature of physical activity engagement for adults with IDD. Insights from adults with IDD, caregivers, DSPs, and exercise professionals reveal that both intrinsic and extrinsic factors influence participation in physical activity. Adults with IDD often rely on external motivators, emphasizing the need for concrete goals and visual support. Tailoring programs to individual needs and ensuring inclusiveness can improve understanding of the benefits and importance of physical activity, encouraging continuous participation. Future research should focus on developing and evaluating interventions that effectively convey the long-term benefits of physical activity to adults with IDD. Additionally, exploring strategies to enhance intrinsic motivation and goal-setting abilities within this population is essential. Addressing these areas can lead to more effective interventions that promote long-term engagement in physical activities, ultimately improving the overall health and well-being of adults with IDD.

408.057 Exploring Factors Related to Vocational and Educational Engagement Among Autistic Young Adults with Low IQ

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Background: Autistic transition-aged youth face low rates of employment and enrollment in post-secondary education programs. Even lower rates have been documented for autistic youth with low IQ. Notably, much of the work describing the vocational and educational activities of autistic individuals with low IQ was conducted over a decade ago, and the landscape of employment and post-secondary educational opportunities has changed immensely.

Objectives: The present study described the rate of involvement in vocational and educational activities of autistic youth with low IQ. We also explored differences in demographic and behavioral characteristics between those who were and were not involved in vocational and educational activities.

Methods: Participants were 91 parents of autistic youth with low IQ (defined as an IQ of 70 or below) enrolled in a larger study. All youth had exited high school (M age = 23.11 years). Parents reported on their youth's vocational and educational activities and demographics, including youth age, race, and ethnicity, caregiver education, household income (above or below \$60,000), and whether the family lived in a rural or urban residence, obtained by matching each family's zip code to USDA rural-urban commuting area codes. Caregivers also reported on youths' behavior characteristics via survey, including their daily living skills measured via the Waisman Activities of Daily Living Scale, autism traits indexed from the Social Responsiveness Scale-2, and internalizing and externalizing behavior measured from the Child/Adult Behavior Checklist. Frequencies and percentages were computed to describe daytime activities. T-tests or chi-square tests were conducted to investigate differences in demographic and behavioral characteristics for those who were versus were not involved in vocational and educational activities.

Results: Thirty-five percent of autistic youth with low IQ were not involved in any vocational or educational activity. Of the 65% of youth engaged in vocational and educational activities, 29% participated 10 hours or less per week. Autistic youth with low IQ who participated in vocational and education activities had significantly higher family income ($p=.043$) and daily living skills ($p=.007$) and lower internalizing behavior ($p=.006$), externalizing behavior ($p=.025$), and autism traits ($p=.042$) than those who were not engaged in activities. Refer to Table 1 for descriptive and test statistics.

Conclusions: The number of autistic youth with low IQ who were not involved in any vocational or educational activity is substantially higher than reported rates in earlier work, which could be due to a variety of reasons, such as movement away from segregated work settings without necessary investment to support community placement. Aligning with previous research, results suggest that behavioral characteristics, including daily living skills, autism traits, and internalizing and externalizing behavior, may be important targets in improving involvement in these activities. Results also indicate that families with greater socio-economic resources may be better equipped to support their youths' participation in vocational and educational activities, suggesting systemic change is needed to ensure these opportunities are accessible for all. Overall, findings point to a clear and immediate need to increase engagement in vocational and educational activities for autistic youth with low IQ.



408.058 Exploring Gender As a Moderator of the Relationship between Depression and Externalizing Behaviors in Autistic Adolescents

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Background: In the face of an adolescent mental health crisis (Benton et al., 2021), understanding pathways toward adolescent well-being is critical. This is especially true for autistic teens, who not only demonstrate significantly higher levels of both internalizing and externalizing symptomatology but are also more likely to have unmet mental health needs than neurotypical peers (Bauminger et al., 2010; Pezzimenti et al., 2019; Mandy et al., 2022). Among the general population of adolescents, previous research documents a positive predictive relationship between depression and externalizing behaviors, which is more robust in males than females (Little & Garber, 2005; Liu et al., 2023). However, this relationship, and the role of gender in it, has not yet been extensively studied in autistic adolescents. Given that gender differences commonly observed in the general population, such as higher rates of externalizing behaviors in male youth, do not always extend to autistic youth (Mayes et al., 2020; Woodman et al., 2016), this research would be informative to clinical practice in neurodivergent youth.

Objectives: This study aimed to test gender as a moderator of the relationship between depression and externalizing behaviors in autistic adolescents.

Methods: Participants included 137 autistic adolescents between the ages of 10 and 18 ($M_{age}=14.06$, $SD=1.9$) who presented for the evidence-based PEERS® for Adolescents social skills program. Thirty-five adolescents identified as female (25.5%; $n = 102$ male, 74.5%). Externalizing behaviors were assessed at baseline using caregiver reports on the externalizing subscale of the Social Skills Improvement System (SSIS-Ext; Gresham & Elliott, 2008). Depression was measured via self-report using the total t-score on the Children's Depression Inventory, 2nd Edition (CDI-2; Kovacs, 2011). To test gender as a moderator, a multiple regression model was conducted with depression, gender, and their interaction inputted as predictors of externalizing behaviors.

Results: An independent samples t-test indicated that there were no significant differences between autistic males and females in externalizing behaviors, $t(134)=0.65$, $p=.519$, or depression, $t(132)=0.03$, $p=.979$. In the full sample, CDI-2 scores were not significantly correlated with SSIS-Ext scores, $r=.043$, $p=.622$. In testing whether the predictive relationship between depression and externalizing behavior was moderated by adolescent gender, the regression revealed a non-significant interaction effect, $t(129)=-0.40$, $p=.69$, suggesting no gender differences in the relationship.

Conclusions: Results are consistent with previous literature that suggest a lack of gender differences in autistic youth and adults in levels of internalizing and externalizing symptoms (Mayes et al., 2020; Woodman et al., 2016) – despite data documenting gender differences in these domains in the general population (Girgus & Yang, 2015; Bauminger et al., 2010). Further, there was no significant relationship between depression and externalizing behaviors detected for either autistic males or females. It is possible that the strongest mechanisms of risk for both internalizing and externalizing behaviors are tied to neurobiological and environmental factors (e.g., high rates of peer victimization) that are present in autistic youth across gender. Overall, these data have important implications for clinicians in that traditional therapeutic conceptualizations about gender, mental health, and behavior may not be applicable to autistic populations.

408.059 Exploring Modifiable Factors That Shape Well-Being Among Autistic Adults

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Background: Autistic individuals are more likely to experience increased mental health diagnoses, lower quality of life and poorer state of well-being than their non-autistic adults. Well-being is a multifaceted state of health that encompasses physical, mental, social and spiritual experiences. Involving life satisfaction, relationships and social engagement, employment, living arrangements, leisure activities and the broader economic and environmental context. The experience of well-being can differ significantly for autistic individuals compared to neurotypical individuals. A more inclusive understanding of wellbeing must recognise the unique aspects of the autistic community, including differences in sensory processing and experiences of burnout. Considering that autistic adults are at greater risk of mental health challenges. Several modifiable factors place an individual at greater risk of or protect them against, mental health challenges, as these can be enhanced to promote positive mental well-being. Modifiable wellbeing factors may include engagement in meaningful activities, access and engagement with social supports, intolerance to uncertainty, loneliness and positive autistic social identity, compared to camouflaging. There is much evidence of research investigating factors impacting the well-being of autistic adults in isolation. However, there is a gap in exploring multiple factors in combination.

Objectives: This study investigates the relationship between a series of modifiable factors and well-being among autistic adults.

Methods: This study utilised a cross-sectional mixed-methods convergent design comprising of an online survey and voluntary participation in a semi-structured interview. In total, $n=42$ participants ($M_{age}=28.6$) completed the questionnaire and, $n=11$ interviews ($M_{age}=31.1$). The survey included the following questionnaires: Autism Quotient-50 (AQ-50), Pittsburgh Sleep Quality Index, Godin Leisure-Time Exercise Questionnaire, Camouflaging Autistic Traits Questionnaire (CAT-Q), UCLA Revised Loneliness Scale (UCLA-RLS), Autism Spectrum Identity Scale, and the Personal Well-being Index (PWI). Relationships were explored within the quantitative data using SPSS. The qualitative data from the transcripts from the semi-structured interviews were analysed using reflexive thematic analysis were used to analyse the data.

Results: The quantitative analysis identified significant correlations between the PWI with AQ-50 ($r(40)=-0.438$, $r^2=-0.192$ $p=0.004$), camouflaging [$r(40)=-0.327$, $r^2=0.107$, $p=0.03$] and loneliness ($r(40)=-0.794$, $r^2=0.630$ $p<0.001$). The qualitative analysis identified four themes: (1) *being supported and socially connected enhances well-being*, (2) *to belong is to conform, to conform is to mask, to mask is to harm*, (3) *avoiding burnout through a balanced routine*, and (4) *responses to overwhelming situations*. Combining the quantitative and qualitative data emphasised the importance of belonging, engaging in support, forming meaningful connections, having balance, and managing overwhelming situations.

Conclusions: Findings suggest that while camouflaging can offer autistic adults benefits such as social acceptance with neurotypical individuals, the negative impact of increased loneliness, fatigue and stress, and not being accepted for their authentic self takes a toll on mental and physical well-being. Therefore, it is essential to develop strategies and supportive environments that encourage self-acceptance, reduce the pressure to mask, and promote a positive autistic identity. Information from this study may provide further knowledge to improve existing programs and develop supports specifically targeting camouflaging autistic identity and loneliness in the autistic community.

408.060 Exploring the Homeostatic Theory of Subjective Wellbeing in Autistic Adults

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Background: The homeostatic theory of Subjective Wellbeing (SWB) proposes that SWB is homeostatically maintained within a set-point range (70- to 90-points on a scale of 0-100) by cognitive and social *buffers*, such as self-esteem and relationships. Individuals with ineffective buffers may be vulnerable to *homeostatic defeat*, and consequently experience low SWB, which when sustained leads to depression. Homeostatic defeat has been found when SWB falls below 50-points in very large global samples from over 40 nations. Autistic people may be at increased risk of homeostatic defeat in the maintenance of healthy SWB due to difficulties achieving the developmental milestones critical to establishing and maintaining buffers such as relationships.

Objectives: To examine the utility of homeostatic theory of SWB in understanding depression in autistic adults.

Methods: A cross-sectional quantitative study of 170 autistic adults ($M_{age}=30.59$, $SD=9.45$), 86 (50.6%) assigned male at birth, 81 (47.6%) assigned female at birth, and three (1.8%) did not specify. Participants completed an online survey between December 2023 and March 2024 on measures of autistic traits (Social Responsiveness Scale Second Edition), SWB (Personal Wellbeing Index-Adult [PWI-A]), and depression (Depression Anxiety Stress Scale-21).

Results: Our sample scored low in SWB ($M=48.89$, $SD=20.84$) with 50% scoring less than 50-points. Two thirds of our sample scored below the cut-off for depression: 26.6% moderately severe, and 39.4% severe depression symptoms. A stepwise regression revealed that age and assigned sex at birth did not significantly predict depression $F(2, 167) 2.95$, $p=.05$, $\eta^2=0.03$, autistic traits significantly predicted depression, $F(3, 166) 7.85$, $p<.001$, $\eta^2=0.09$, and SWB significantly predicted depression, $F(4, 165) = 38.91$, $p>.001$, $\eta^2=0.32$. This model explained 49% of the variance in depression ($R^2 = 0.49$, $p<.001$), SWB the strongest predictor ($b = -.64$, $p<.001$), then autistic traits ($b=.31$, $p<.001$), and assigned sex at birth ($b = .16$, $p<.05$). There was a significant difference in the mean depression symptoms between those with higher (>50 -points) and lower (<50 -points) SWB, $t(156.13) = 9.83$, $p<.001$, $\eta^2=0.38$, $d=1.57$; those with lower SWB ($M=13.87$, $SD=4.89$) reported higher depression symptoms compared to those with higher SWB ($M=7.34$, $SD=3.69$).

Conclusions: The current study's findings support SWB as a potential mechanism implicated in depression for autistic adults. The mean score in SWB for our sample was well below positive range expected based on adult population norms, suggesting this group were more vulnerable to homeostatic defeat. We suggest that SWB could be used to screen those at risk of depression, and that theorized buffers be explored as possible leverage points for intervention.

408.062 Exploring the Relationship between Loneliness and Externalizing Behaviors in Autistic Young Adults

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Background: Loneliness is a prevalent concern for autistic children (Bauminger & Kasari, 2000) that worsens during the transition to adulthood, making this a critical period to investigate (Schiltz et al., 2024). Most research about loneliness in autism focuses on unidimensional measures of loneliness, failing to capture distinctions between emotional loneliness (the absence of close, intimate relationships, e.g. familial and romantic) and social loneliness (the lack of wider social networks or group connections). Existing literature shows associations between emotional and social loneliness and internalizing symptoms (e.g., social anxiety and depression) in autistic adults (Schiltz et al., 2021); however, the relationship between loneliness and externalizing behaviors (e.g., aggressive, rule-breaking, and intrusive behaviors) remains underexplored.

Objectives: To examine the associations of multiple dimensions of loneliness with externalizing behaviors.

Methods: Participants included 80 individuals, 41 autistic and 39 non-autistic individuals ages 18–22 ($M = 19.9$, $SD = 1.5$ and $M = 20.0$, $SD = 1.4$, respectively) with average IQ as measured by the Wechsler Abbreviated Scale of Intelligence-II (autistic group $M = 99.4$, $SD = 14.0$; non-autistic group $M = 108.9$, $SD = 12.3$). The Social and Emotional Loneliness Scale for Adults-Short Version (DiTommaso et al., 2004) measured loneliness via a total score and three subscales: social, family, and romantic loneliness. The Adult Self Report of the Achenbach System of Empirically Based Assessment measured externalizing problems. Independent samples t-tests and Spearman's correlations and partial correlations with autism symptoms (Schiltz et al., 2021) and IQ as covariates were used in analyses.

Results: There were significant between group differences in total [$t(61.3) = 3.950$, $p < .001$] and romantic [$t(46.9) = 5.391$, $p < .001$] loneliness. No significant group differences were found in family or social loneliness. There was a correlation with a medium effect size ($r = .4$, $p = .029$) between total loneliness and externalizing problems in the autistic group, and a partial correlation with a medium effect size when accounting for autism symptom severity ($r = .4$, $p = .042$). In addition, there was a correlation with a medium effect size between externalizing problems and family loneliness ($r = .4$, $p = .033$) in autistic individuals, which remained significant after accounting for IQ ($r = .4$, $p = .021$) and autism symptom severity ($r = .5$, $p = .005$).

Conclusions: Autistic participants reported higher total and romantic loneliness, highlighting the need for targeted interventions during this transitional period. As hypothesized, externalizing symptoms correlated with loneliness, particularly family loneliness, suggesting that family relationships influence the expression of externalizing behaviors. Future research should explore the mechanisms linking family loneliness to behavior and assess how family engagement can reduce externalizing symptoms and improve well-being in autistic adults.

408.063 Job Characteristics of Autistic Adults: Associations with Satisfaction

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Background: Employment outcomes are an important aspect of quality of life for autistic adults (Clarke et al., 2021; Mason et al., 2018). In addition to understanding facilitators of gaining employment, it is important to also consider factors that contribute to autistic adults' satisfaction in the workforce (Hedley et al. 2017; Pfeiffer et al. 2018).

Objectives: The current study addressed this issue by examining the levels of job satisfaction for autistic adults and the association of various workplace characteristics with job satisfaction.

Methods: This analysis used baseline data from a longitudinal study of employment stability among autistic adults. Current analysis included 108 adults who were working in the community when data was collected. Autistic adults (67% male) between the ages of 18-45 ($M=28.4$) completed an interview that probed for information about vocational and educational activities (Taylor & Seltzer, 2012). The Occupational Network (O*net) was used to code jobs into sectors (broad occupational categories based on related activities) and whether the level of education needed for the job corresponded to the adult's education (over-educated/not over-educated)

Participants completed three workplace climate questionnaires (diversity climate, psychological safety, leader-member exchange; Edmonson, 1999; Mor Barak et al., 1998); scores from these measures were summed into a total workplace climate score. Higher scores indicate a safer and more supportive workplace climate. Job satisfaction was measured using the Job Descriptive Index (JDI; Smith et al., 1969), a 38-item questionnaire measuring job satisfaction across five facets: supervision, coworkers, pay, promotions, and the work itself. Descriptive statistics and linear regressions were conducted.

Results: 40.7% of the employed autistic adults were working full-time (≥ 35 hours/week), 25.9% were over-educated for their jobs, and 10% were receiving disability-related supports on the job. The most frequently reported occupations were in Transportation and Material Moving, Office and Administrative Support, and Food Preparation and Serving (Table 1). Median ratings of job satisfaction in the current sample were compared to medians obtained from a normed nationally representative sample ($n = 1,485$; Gillespie et al., 2016; Figure 1). Visual inspection suggested that overall, adults with autism across age ranges reported similar, if not higher, job satisfaction than the nationally representative sample across all facets.

Participants with higher workplace climate scores reported higher job satisfaction with coworkers ($b=8.52$, $p \leq .001$), supervision ($b=13.87$, $p \leq .001$), pay ($b=7.44$, $p \leq .001$), promotions ($b=12.16$, $p \leq .001$), and the work itself ($b=9.87$, $p \leq .001$). Autistic adults who had a full-time job ($b=6.47$, $p = .048$) and were not overeducated ($b=-7.96$, $p = .026$) for their jobs had higher satisfaction with pay. Receiving job supports was not associated with scores for any facet of job satisfaction.

Conclusions: The current findings suggest that facilitating obtainment of jobs that are consistent with a person's education and full-time positions may lead to the appraisal of pay as more fulfilling. These findings also highlight the impact of promoting a safer and more supportive workplace climate on job satisfaction be it through treating employees fairly, creating a safe environment to take risks within, or cultivating a workplace culture that values diversity.



408.064 Factors Influencing Dropout Among Autistic Students in Universities: A Meta-Synthesis of Qualitative Studies Involving Autistic Individuals

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Background: Current estimates suggest that approximately 2% of students in higher education are diagnosed as Autistic, which is likely an underestimation of the true prevalence due to non-disclosure and diagnostic challenges. Autistic students in higher education face unique challenges that impact their academic persistence and success. Despite possessing strengths such as detailed focus and strong memory recall, these students often experience higher dropout rates compared to their neurotypical peers and those with other disabilities. The benefits of higher education are substantial, particularly in enhancing quality of life through better employment prospects and greater independence. Identifying and addressing the factors leading to high dropout rates is essential for developing interventions that promote a more supportive academic environment for autistic students.

Objectives: This review systematically investigates and analyses the factors that influence dropout rates among autistic students in higher education, focusing on firsthand accounts of autistic students. It draws on qualitative and mixed-method studies to address the question: What are the key factors influencing dropout rates among autistic university students across various degree programs and institutions worldwide? The aim is to identify insights that can inform interventions to improve educational outcomes for autistic adults.

Methods: This meta-synthesis, adhering to PRISMA guidelines, utilised the PICOS framework for a systematic review. Searches across Scopus, PsychINFO, Medline via OVID, and ERIC yielded 2,303 initial articles. Thirteen studies were selected based on relevance and peer review, involving 521 participants aged 18 to 54, primarily diagnosed with Autism Spectrum Disorder and based in the UK, USA, and Australia. All participants had either considered dropping out, actually dropped out, or deferred a year. These studies examined dropout rates and potential contributory factors, with findings appraised for quality using the CASP checklist and determined to be of moderate to good quality.

Results: Analysis of the thirteen studies found significant challenges faced by Autistic students in higher education, revealing an overarching theme of 'Environmental Discord'—systemic mismatches between educational structures and autistic students' needs that exacerbate academic and mental health challenges. Mental health issues emerged as a critical factor influencing dropout rates, with students reporting exacerbated conditions such as anxiety and depression due to academic pressures and social isolation. Additionally, the studies highlighted academic challenges related to executive functioning and sensory sensitivities that hinder effective learning and engagement. The analysis also identified gaps in support strategies, indicating that existing services often fail to meet the specific needs of Autistic students, necessitating tailored interventions.

Conclusions: Advocating for the implementation of Universal Design for Learning, this review proposes proactive restructuring of educational environments to better accommodate diverse student needs and enhance their success. Further, the review calls for future research to develop and evaluate personalised interventions aimed at the specific mental health and academic challenges faced by Autistic students. Such research is crucial for not only improving educational outcomes and retention rates but also enhancing the overall quality of life for Autistic students.

408.065 Finding Safe Soulmates: Perspectives of Autistic Adults on Relationships and Sex Education

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Background:

Relationships and Sex Education (RSE) became a Statutory Requirement in England in 2020 for all students, inclusive of those with Special Education Needs and Disabilities (SEND). This is important considering that research into the perspectives of parents and teachers over past decades revealed concerning misconceptions that some students, like autistic youth, do not need RSE (Gürol, Polat, and Oran, 2014) or that it is dangerous (Neufeld *et al*, 2002). Recently, research has revealed that RSE reduces autistic individual's vulnerability to exploitation (Strnadová *et al*, 2022), and offers increasing support for the value of RSE for all. Yet teacher confidence delivering RSE has been found to be low (Strnadová, 2022). RSE content has been debated in England, with the Government's draft guidance in 2024 dismissed by leading RSE groups like the PSHE Association.

Research into the most beneficial forms of how and what to teach in RSE is increasingly paramount. Research into RSE for autistic people predominantly focuses on the perspectives of teachers and parents, therefore this study focuses on the views of autistic adults who have experienced RSE in the British education system.

Objectives:

The study aims to support educational settings answering practical questions regarding what topics to teach as priorities to autistic students and how to teach them effectively to support students preparing to navigate real life adult experiences. The research aims to answer: 1) To what extent was RSE useful in supporting participants to navigate adult romantic and sexual relationships? 2) How might their experiences inform future teaching of RSE?

Methods:

Ten autistic adults were recruited from the Cambridge-based Safe Soulmates friendship and dating network for neurodivergent and disabled adults. The qualitative study entailed semi-structured interviews with them to ascertain their perspectives to answer the research questions. Data was analysed using a reflective thematic analysis (Braun & Clarke, 2006).

Results:

Analysis of data provided key themes relating to; a link between quality of RSE and wellbeing; an educational priority of supporting to navigate boundaries, communication and expectations in relationships; as well as the value of support networks and healthy, diverse representation of relationships in the media.

The data provides support for the desire for high quality RSE for autistic students and that negative experiences of RSE can be a barrier to learning and detrimentally affect adult wellbeing and experiences. It also emphasises that societal views and behaviour have an impact on an individual's safety and self acceptance.

Conclusions:

This research indicates specific Government guidance would be useful, which highlights key priorities for autistic students' RSE to include navigating communications and consent, LGBTQIA+ topics and emphasis on capacity to choose a range of relationship types. Teachers should receive in depth training to improve subject knowledge and confidence, also to teach explicit and clear information - particularly clarifying nuances in topics. Schools may wish to consider methods of facilitating healthy support networks, or providing additional information for parents. Emphasis should be placed on educating allistic students about sexual harassment, with the aim to reduce capacity for causing abuse.

408.066 Gaming Disorder As a Predictor of 24-Hour Movement Behaviors in Autistic Adults with and without Mild Intellectual Disabilities

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Background: Autistic adults often display a greater susceptibility to excessive gaming behaviors due to their natural predilection for digital gaming and distinct strength in visuospatial learning. This affinity for gaming may negatively impact 24-hour movement behaviors, including physical activity (PA), sedentary behavior (SB), and sleep, in autistic adults, who are already predisposed to insufficient PA and sleep due to unique individual and environmental barriers, such as high sensory sensitivities and low intrinsic motivation for exercise.

Objectives: This study aimed to (1) identify the prevalence of gaming disorder and characteristics of 24-hour movement behaviors and (2) assess the relationship between gaming behavior, PA, SB, and sleep quality in autistic adults, including those with co-occurring mild intellectual disabilities (ID).

Methods: An online, self-report survey was developed using standardized instruments to assess demographic information, gaming behavior, PA, SB, and sleep in autistic adults. The survey was reviewed for content validity and took approximately 15 minutes to complete. Participants were recruited with the assistance from the Simons Foundation Powering Autism Research for Knowledge (SPARK) Research Match services. The inclusion criteria were: adults (1) aged 18 to 55 years, (2) formally diagnosed with an autism spectrum disorder by a medical professional or self-identifying as autistic, and (3) able to walk and process information independently without substantial support from assistive devices or others. Descriptive statistics were used to summarize demographic characteristics and patterns in the preventive health behaviors. Pearson correlation and stepwise multiple regression analyses were performed to examine the relationship between gaming behavior, PA, sedentary time, and sleep quality, as well as other demographic variables. Multicollinearity was not observed in regression models. SPSS v29.0 (IBM Corp., NY, USA) was used to analyze the data.

Results: Forty-six autistic adults (Mage 33.3±10.3; 80% females; 43.5% with mild ID) completed the survey. Autistic adults spent 625.8±910.3 min/week for video/online gaming, 86.9±102.0 min/week for moderate PA and 39.8±73.4 min/week for vigorous PA engagement. Sedentary time was relatively higher on weekend (583.0±304.2 min/day) compared to weekday (573.3±271.5 min/day). 15.2% of the participants were identified as potentially having a gaming disorder while 39.1% had poor sleep quality. The total gaming disorder score was significantly associated with total gaming time ($r=.43, p=.003$), vigorous PA ($r=-.30, p=.042$), weekday sedentary time ($r=.59, p<.001$), and weekend sedentary time ($r=.37, p=.011$). Stepwise multiple regression models revealed that the total gaming disorder score was one of the most influential factors in predicting vigorous PA, $F(3, 42) = 15.098, R^2 = .52$ and weekday sedentary time $F(2, 43) = 46.444, R^2 = .68$ (all $p<.001$).

Conclusions: The preliminary findings of this study align with previous research, indicating that autistic adults may be more susceptible to excessive gaming behaviors. Although no significant association was found between gaming behavior and sleep quality, gaming was correlated with increased sedentary time and reduced engagement in vigorous PA. These results suggest that gaming behaviors may contribute to sedentary lifestyles, underscoring the need for targeted, strength-based interventions that promote healthy 24-hour movement behaviors among autistic adults.

408.067 Genetic Liability for Psychiatric Disorders and Associations with Adolescent Psychiatric, Social, and Behavioral Outcomes Among Autistic and Non-Autistic Individuals

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Background: Autism spectrum disorder (ASD) is commonly diagnosed in childhood and poses challenges for individuals and their families into adolescence and throughout the lifespan. Autistic individuals have higher risks of co-occurring psychiatric, social, and behavioral conditions across multiple life stages including adolescence. Genetic correlations of ASD with co-occurring conditions have been identified in childhood samples. However, evidence is limited on whether genetic risk factors related to ASD and other psychiatric disorders are associated with co-occurring conditions in adolescence.

Objectives: Test whether polygenic scores (PGS) for 5 psychiatric conditions, derived in childhood samples, show prospective associations with adolescent psychiatric, social, and behavioral outcomes in autistic and non-autistic adolescents.

Methods: Study to Explore Early Development (SEED) participants were enrolled, at age 2-5 years, from 6 US sites and classified into ASD cases, population-based controls (POP), or non-ASD developmental delays (DD) based on rigorous clinical evaluation. A follow-up survey was conducted among caregivers of a subset of SEED participants at age 12-16 years, which asked about healthcare provider diagnoses of adolescent psychiatric conditions (any psychiatric condition, attention-deficit/hyperactivity disorder (ADHD), anxiety, depression), and social (Social Responsive Scale (SRS) scores) and behavioral outcomes (speech/language disorder, sensory integration problems, verbal communication problems). Genotyping was performed on Illumina HumanOmni1-Quad BeadChip or Affymetrix Axiom KP array, and rigorous quality control metrics were applied. PGS for each of the following psychiatric conditions were derived using Bayesian shrinkage method (*LDPre2-auto*), leveraging external summary statistics of genome-wide association studies from Psychiatric Genomic Consortium or dbGap database: any psychiatric condition, ASD, ADHD, anxiety, and major depressive disorder (MDD). We calculated pairwise genetic correlations using linkage disequilibrium score regression and PGS correlations. We used a series of logistic regressions to test associations of each psychiatric PGS with adolescent outcomes in the overall sample and within childhood ASD classification strata.

Results: A total of 528 participants (125 ASD, 206 POP, 197 DD) were included, with mean age of 15 years old at follow up. C-statistics of PGS for any psychiatric condition, ASD, ADHD, anxiety, and MDD were 0.574, 0.629, 0.614, 0.533, and 0.597, respectively. Genetic correlations and PGS correlations were observed (Figure 1). ASD-PGS was associated with elevated adolescent SRS scores (odds ratio (OR) = 1.80, 95% confidence interval (CI): 1.22, 2.68) and communication problems (OR = 1.54, 95% CI: 1.04, 2.26) (Figure 2). ADHD-PGS was associated with adolescent ADHD (OR = 1.46, 95% CI: 1.15, 1.85). MDD-PGS was associated with any psychiatric disorder (OR = 1.33, CI: 1.02, 1.72) and ADHD (OR = 1.40, 95% CI: 1.09, 1.80), and marginally associated with depression (OR = 1.42, 95% CI: 0.97, 2.08). In the childhood DD group, we additionally observed marginal positive associations of any psychiatric condition PGS with adolescent ADHD, ADHD-PGS with anxiety and speech/language disorder, and anxiety-PGS with sensory integration disorder.

Conclusions: These results contribute to the growing evidence of shared genetic architectures between psychiatric disorders and ASD co-occurring conditions in adolescence. Psychiatric PGS, measurable at childhood, may provide insights into the developmental trajectories of individuals with ASD and guide early interventions.



408.068 Health Related Quality of Life Outcomes for Autistic Adolescents: A Population Based Study

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Background: Health-related quality of life (HRQoL) is a broad concept that includes aspects such as physical, psychological and social functioning and well-being. Research on how HRQoL may differ between autistic and non-autistic adolescents and the predictive influence of early childhood characteristics on HRQoL outcomes in autistic adolescents is limited.

Objectives: This study used data from a large population-based longitudinal study, the Longitudinal Study of Australian Children (LSAC), to compare HRQoL between autistic and non-autistic adolescents. We also assessed the predictive association of early childhood characteristics on HRQoL outcomes in autistic adolescents aged 14-15 years.

Methods: Two cohorts of autistic children ($n = 145$ (Birth cohort); $n = 91$ (Kinder cohort)) were drawn from the population-based sample ($n = 3030$ (Birth cohort); $n = 2454$ (Kinder cohort)). Early predictor measures were assessed at 4 years for language, sex, socioeconomic factors, level of autistic symptoms, social functioning, and 6 years for nonverbal IQ. HRQoL was assessed at 14-15 years, using the Pediatric Quality of Life (PedsQL) Inventory. The PedsQL subscales (physical, social, emotional, school functioning), summary scores (psychosocial and physical health), and total HRQoL score were compared between autistic and non-autistic adolescents using independent samples t-tests. Multiple linear regressions were used to assess predictors of HRQoL for autistic adolescents at 14-15 years.

Results: In both cohorts, autistic adolescents demonstrated significantly lower scores across all PedsQL scores compared with non-autistic peers ($p < .001$ for all comparisons). The social functioning subscale had the largest effect size for the Birth ($d = 1.395$) and Kinder cohorts ($d = 1.360$). Level of autistic traits and receptive language ability predicted HRQoL in the Birth cohort, contributing 26.9% of the variability in HRQoL. No consistent predictors were identified in the Kinder cohort.

Conclusions: Our findings align with previous research indicating significantly lower HRQoL in autistic adolescents compared with non-autistic peers. Further research into modifiable factors that influence HRQoL may encourage investigation into targeted early interventions focused on improving outcomes for future autistic adolescents.

408.069 Identifying Daily Living Skills from Childhood and Adolescence Predictive of Adult Outcomes in a Longitudinal Study of Autism

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Background: Many studies have documented deficits in daily living skills (DLS) in autistic individuals (Smith et al., 2012); notably, strong DLS are associated with a higher likelihood of attaining some adult outcomes (Clarke et al., 2021). However, it is unclear whether specific DLS (e.g., bathing, cooking, toileting) are more important to adult success than others and how this may vary across development.

Objectives: 1) Examine growth patterns in VABS DLS mean item set scores from ages 5, 9, 14, and 18 in a longitudinal autism sample. 2) Identify VABS DLS mean item set scores from ages 5, 9, 14, and 18 that—controlling for IQ, autism symptomology, and other salient characteristics—predict employment, well-being, friendship, and residential outcomes at approximately age 33.

Methods: The current analyses include data from 230 participants enrolled in a well-characterized longitudinal cohort of autistic individuals (Table 1). Analyses were conducted separately for individuals with verbal IQ of 70 or greater (more cognitively able, or MA) and individuals with verbal IQ of less than 70 (less cognitively able, or LA). First, growth patterns in DLS mean item set scores by cognitive ability were examined from ages 5-18. The utility of DLS mean item set scores from ages 5, 9, 14, and 18 for predicting employment, well-being, friendship, and residential outcomes at approximately age 33 was then tested via multiple hierarchical and binary logistic regression. Given the number of tests required, the significance level was set at $p \leq .01$.

Results: For both MA and LA participants, item sets from the community subdomain of DLS had the lowest mean scores, with the least growth over time (Figure 1). For LA participants only, regression analyses indicated that higher scores at age 5 on two item sets from the personal subdomain of DLS, bathing and healthcare, predicted participation in employment activities in adulthood. Higher bathing and healthcare scores at ages 9 and 14 predicted higher caregiver-reported well-being in adulthood. For MA participants only, item sets from the community subdomain of DLS predicted adult employment and well-being. Specifically, regression analyses indicated that higher pre-job skills item set scores at age 9 predicted more participation in employment activities in adulthood. At age 18, higher pre-job skills and restaurant skills item set scores predicted higher caregiver-reported well-being. No DLS item sets predicted adult residential status or social relationships for LA or MA participants.

Conclusions: These results provide insight into specific DLS that may support adult outcomes for autistic individuals and, by extension, could be used to inform interventions for this population. Notably, the DLS that predicted adult outcomes appeared to vary more with participant cognitive ability than age. The limited growth in community DLS observed here is concerning, given that two item sets from the community subdomain emerged as significant predictors of employment and well-being for MA participants. For LA individuals, interventions targeting skills related to personal hygiene (e.g., showering independently) and health (e.g., covering one's nose when coughing or sneezing) may promote quality of life and improve the likelihood of employment in adulthood.



408.070 Implicit Preference for Communication Among Adults with Autism Spectrum Disorder Using the Implicit Association Test

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Background:

The preferences for communication may inherently differ from person to person. However, the Japanese adults with ASD may have been continuously taught to believe that communication is an enjoyable experience (e.g. Make lots of friends). The adults with ASD who are under such social pressures, may exhibit different tendencies between implicit measures from the typically developed (TD) adults.

Objectives:

Our aim is to compare the implicit preferences for communication, as assessed by the Implicit Association Test (IAT), with conventional ASD measures, the Autism Quotient (AQ) and the Social Responsiveness Scale Second Edition Adult (SRS-2: Adult). In addition, we investigated the relationship between IAT, and well-being and loneliness. We compared those results of the adults with ASD and the TD adults.

Methods:

Participants were 26 adults with ASD (mean age 31.1 ± 5.2 years, 26.9% female) and 26 TD adults (mean age 28.9 ± 7.4 years, 34.6% female). Participants performed the Implicit Association Test designed to measure attitudes towards being with someone. We used the concept words “together” and “alone” in Japanese (“一緒に” and “一人で”) and the attitude words “fun” and “boring” in Japanese (“楽しい” and “つまらない”). The adults with ASD completed the AQ and SRS-2 at their diagnosis, while the TD adults completed them before the IAT. For explicit assessments for well-being and loneliness, they completed the World Health Organization-Five Well-Being Index (WHO-5), and the UCLA Loneliness Scale (UCLA). This research was approved by the ethics committee of the Waseda University.

Results:

The IAT D score showed a significant correlation with the AQ and SRS-2 in the TD group (IAT - AQ: $r = -0.47$, $p = 0.015$; IAT - SRS-2: $r = -0.47$, $p = 0.015$), but no significant correlation was observed in the ASD group (IAT - AQ: $r = -0.085$, $p = 0.68$; IAT - SRS-2: $r = 0.0091$, $p = 0.96$). The slopes for the TD and ASD groups did not differ (IAT - AQ: $F = 0.77$, $p = 0.38$; IAT - SRS-2: $F = 2.79$, $p = 0.10$). Additionally, the IAT D score showed a significant correlation with the UCLA in the TD group ($r = -0.65$, $p < 0.01$) but no correlation in the ASD group ($r = 0.092$, $p = 0.65$). The slope of the regression line was significantly different between the ASD and TD groups ($F = 6.14$, $p = 0.017$). As a similar result, there was a significantly correlation between IAT and WHO-5 in the TD group ($r = 0.41$, $p = 0.038$) but no correlation in the ASD group ($r = -0.13$, $p = 0.53$). In this case, the slope of the regression line did not significantly differ between the ASD and TD groups ($F = 3.32$, $p = 0.074$).

Conclusions:

It's suggested that individuals in the TD group may exhibit consistency between what is measured by explicit and implicit assessments, while individuals in the ASD group may experience a discrepancy between explicit and implicit tendencies. This implicit indicator may explain differences in the tendency toward loneliness.

408.071 Impression Management and Camouflaging in French Autistic Adults of the Face-ASD National Cohort: Relationships with Sex-Assigned-at-Birth, Gender Identity, Gender Role Expression, and Autistic Features

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Background: Some autistic people camouflage to hide or compensate for their autistic differences. Although camouflaging overlaps conceptually with impression management (IM), few studies have directly examined IM tendencies in autistic people, especially outside English-speaking countries. Research in mostly English-speaking regions found that autistic women engage in greater camouflaging than autistic men, which could result in sex- and gender-related barriers to diagnosis. Two key questions are why these observed sex- and gender-related differences occur, and how camouflaging influences autistic clinical presentation over time, in different social-cultural contexts.

Objectives: 1) Specify latent dimensions of camouflaging and IM in French autistic adults; 2) Investigate how these dimensions associate with sex-at-birth, gender identity, and gender expression; 3) Examine how IM/camouflaging dimensions affect the stability of clinical autism profiles.

Methods: A total of 222 French adults diagnosed with autism (109 assigned-female-at-birth and 113 assigned-male-at-birth, $M_{age}=29.3$ yrs) participated. Measures for IM included the Camouflaging Autistic Trait Questionnaire (CAT-Q), Concern for Appropriateness Scale (CAS), and the Revised Self-Monitoring Scale (RSMS). Gender role expression was measured using the Personal Attributes Questionnaire (PAQ) and the Bem Sex-Role Inventory (BSRI). Clinical autism features were measured using the Autism Diagnostic Interview-Revised (ADI-R) and the Autism Diagnostic Observation Schedule Second Edition (ADOS-2) Module 4. We first performed Exploratory Factor Analysis (EFA) on the subscale-scores of all IM measures to identify their dimensional structure. We then examined the associations between identified IM dimensions and sex-assigned-at-birth, gender identity, and gender role expression using a combination of hierarchical and elastic-net regressions. Lastly, we examined how IM dimensions moderate the links between past (ADI-R) and present (ADOS-2) autistic presentations using multiple regression.

Results: The IM subscales loaded onto two dimensions. The CAT-Q and CAS subscales reflected an “intention” dimension capturing one’s conscious use of IM, whereas the RSMS subscales reflected an “ability” dimension capturing one’s self-perceived capability of enacting IM. The hierarchical regression showed that autistic assigned-females exhibited greater IM intention than autistic assigned-males, $b=21.6$, $p<.001$, and those with greater PAQ communion scores exhibited greater IM ability, $b=0.881$, $p<.001$. The elastic-net regression additionally revealed that, in terms of relative importance, sex-assigned-at-birth and gender identity were important predictors of IM intention, whereas gender role expression traits were more relevant predictors of IM ability (**Figure 1**). Finally, across multiple regression models (**Table 1**), we found one significant interaction, such that the association between ADI-R (ever/most-prominent) restricted-repetitive behaviors and ADOS-2 (present) restricted-repetitive behaviors weakens as IM intention increases.

Conclusions: In French autistic adults, camouflaging and concern for appropriateness converge to capture one’s IM intention, distinctive from one’s IM ability. Concurrent examination of sex-assigned-at-birth, gender identity, and gender role expression effects showed nuances that have not been reported by past research. Whereas IM intention differences may be substantially sex-related, how capable one is at executing IM may relate more to gender role expression traits. Developmental moderation of IM (intention) on autistic features seemed most observable in restricted-repetitive behaviors. These empirical insights reveal how IM/camouflaging may affect autism presentations and relate to several sex and gender factors in the French social-cultural context.

**408.072** A Multi-Study Exploration of Suicidality and Associated Influences in Midlife and Older Age

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Background: Suicide is a leading cause of premature death in autistic populations (Cassidy et al., 2022). Despite an increased risk of suicidal behaviours being found in high autistic trait populations in midlife and older age compared to comparisons (Stewart et al., 2022), no study has yet examined suicidality in older populations with diagnosed autism. Additionally, it is unknown what factors are associated with suicide in older age in autistic populations and whether these differ from non-autistic populations.

Objectives: This study uses data from two complimentary datasets to explore the rates of self-harm and suicidality (study one) and associated influences (study two) in middle-aged and older autism with an autism diagnosis and with high autistic traits.

Methods: Study one uses data from the first wave of the AgeWellAutism project (collected in 2019), a sample of 265 autistic and 167 non-autistic adults aged 40 to 93 years old (mean = ~60 years; ~50% female). Study two uses data from PROTECT cohort, a sample of 9,978 adults aged 50 to 97 years old (mean = ~68 years; ~75% female), with 672 participants having high autistic traits [measured using the AQ-10 cut-off (Allison et al., 2012)]. Participants completed a range of questions related to suicidal behaviours (Stewart et al., 2022), mental health (Kroenke et al., 2001; Lang et al., 2012; Spitzer et al., 2006), and social isolation and loneliness (Lubben et al., 2006; Russell, 1996). In study one, differences in suicidality were explored between autistic and non-autistic participants. In study two, path models were used to ascertain factors mediating the relationship between having high autistic traits and suicidal thoughts and behaviours.

Results: In study one, the autistic group reported significantly higher rates of suicidality, including suicidal ideation [$\chi^2=131.52, p<.001$] and suicidal self-harm [$\chi^2=22.84, p<.001$], when compared to the non-autistic comparisons. In study two, direct paths between autistic traits and suicidal ideation [$b=.043, p=.174$] and suicidal self-harm [$b=.014, p=.076$] were not significant. However, indirect paths from autistic traits to suicidal ideation and suicidal self-harm through symptoms of poor mental health [e.g., $b=.008, p<.001$], social isolation [e.g., $b=.002, p<.001$], and loneliness [e.g., $b=.007, p<.001$], revealed that the relationships between autistic traits and suicide outcomes were being partially mediated by those factors.

Conclusions: The findings from these two complementary studies highlight that middle-aged and older people who are autistic or have high autistic traits are at an increased likelihood of experiencing suicidality vs. non-autistic/low trait comparisons. Findings from study two, albeit cross-sectional and correlational, suggest mental health problems, social isolation and loneliness may be driving this increased likelihood of suicidality and highlights possible targets for intervention to reduce rates of suicidal behaviours in autistic populations, particularly as they get older.

408.073 Does Social Connectedness Change in Midlife and Older Age? a Four-Year Longitudinal Follow-up Study of Autistic and Non-Autistic Adults

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Background: Autistic people often experience high rates of social isolation compared to their non-autistic peers. Recent cross-sectional findings from the AgeWellAutism study found that middle-aged and older autistic people experience high rates of isolation, and this may increase with age (Stewart et al., 2024). Despite the negative impact that isolation has on health, wellbeing and life expectancy in older age (Holt-Lunstad, 2024), no study has yet examined how social connectedness changes in midlife and older age for autistic people using longitudinal methods.

Objectives: This pre-registered study (osf.io/mhf9j) explored how social connectedness changes across a four-year period in midlife and older age for autistic and non-autistic people recruited through various charities and community organisations in the UK.

Methods: Across the first (2019) and second (2023) wave of the AgeWellAutism project, 166 age-/sex-matched participants (n autistic=108, n non-autistic=58; 52% male) aged 40-84 years at baseline (mean age=60 years) completed widely used and standardised questionnaires, including the Lubben Social Connectedness Scale (Lubben et al., 2006). Paired samples t-tests and regression analyses were used to examine change across timepoints.

Results: Paired samples t-tests indicated that family and friendship connectedness scores significantly decreased between the two time points for both the autistic group [$t(107)=8.98, p<.001$; $t(107)=8.28, p<.001$] and non-autistic group [$t(57)=8.98, p<.001$; $t(57)=6.16, p<.001$].

A simple linear regression model showed a significant relationship between family connectedness at T1 and T2 and autism group membership [$R=.94, p<.001$], explaining 88% of the variance in family connectedness at T2 [T1 family connectedness $\beta_{\text{standardised}}=26.88, p<.001$; autism group membership $\beta_{\text{standardised}}=-3.83, p<.001$]. A separate simple linear regression model showed a significant relationship between friendship connectedness at T1 and T2 and autism group membership [$R=.91, p<.001$], explaining 82% of the variance in friendship connectedness at T2 [T1 friendship connectedness $\beta_{\text{standardised}}=17.14, p<.001$; Autism group membership $\beta_{\text{standardised}}=-9.36, p<.001$]. Neither model improved with the addition of age and sex as covariates.

When considering percentage change, the autistic group had a 16% reduction in family connectedness (vs. 9% reduction in non-autistic group) and 28% reduction in friendship connectedness (vs. 10% reduction in non-autistic group) over this period. This difference was statistically significant for both family [$t(164)=1.10, p=.045$] and friendship scores [$t(164)=3.74, p<.001$].

Conclusions: Over a four-year period, social connectedness with family and friends was found to decrease for autistic and non-autistic people in midlife and older age. Connectedness scores at baseline were a key predictor of change in scores over time, however, being autistic was also a significant predictor of decreased connectedness, particularly for friendship connectedness. Furthermore, the autistic group had greater decrease in their overall connectedness scores compared to the non-autistic group, placing them at greater risk of isolation. These findings highlight that middle-aged and older autistic people may be at an increased risk of accelerated decline of connections as they age and may be at a greater risk of becoming socially isolated compared to their non-autistic peers. Addressing declining connectedness in ageing autistic populations could be an important target for interventions to mitigate the negative sequelae of social isolation.

408.074 Factors Associated with Social Isolation and Loneliness in Middle-Aged and Older Adults with High Autistic Traits

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Background: Autistic people often experience higher rates of social isolation and loneliness compared to their non-autistic peers, including in midlife and older age (Stewart et al., 2024). Despite older age being associated with increasing isolation and loneliness in the general population, no study has yet examined factors that are associated with, and may explain, increased isolation and loneliness in autistic or high autistic trait middle-aged and older populations.

Objectives: This study explored relationship between autistic traits, mental health symptoms and adversity, and social isolation and loneliness in a large sample of adults in midlife and older age.

Methods: Using data from the PROTECT cohort, a sample of 9,978 adults aged 50 to 97 years old (mean = ~68 years; ~75% female), with 672 participants having high autistic traits [measured using the AQ-10 cut-off (Allison et al., 2012)]. Participants completed a range of questions related to social isolation and loneliness (Lubben et al., 2006; Russell, 1996), mental health (Kroenke et al., 2001; Lang et al., 2012; Spitzer et al., 2006), and adversity (Grabe et al., 2012; Khalifeh et al., 2015). SEM was used to examine direct and indirect paths from autistic traits to social isolation and loneliness to understand what factors might play a role in any increased loneliness or social isolation in the high autistic traits group.

Results: The high autistic traits group reported more symptoms of loneliness [$W=4,028,518$, $p<.001$] and social isolation [$W=4,304,525$, $p<.001$] than the low autistic trait comparison group. The same pattern was found for symptoms of depression, anxiety, and adversity in childhood and adulthood [$W_s=1,765,687$ to $2,523,577$, $ps<.001$]. Autistic traits had a significant positive direct path to social isolation [$\beta=2.44$, $p<.001$] and loneliness [$\beta=0.38$, $p<.001$]. Symptoms of poor mental health and adversity partially mediated the relationship between autistic traits and social isolation and loneliness; however, these were of small-to-moderate effect [e.g., $\beta_s=0.01$ to 0.42 , $ps\leq.001-.015$] size. Male sex was associated with social isolation [large effect size], while loneliness was associated with female sex [small effect size]. In the full model with all direct and indirect paths added, the relationship between autistic traits and social isolation and loneliness remained significant [$\Sigma=1.45$, $p<.001$].

Conclusions: While symptoms of poor mental health and adversity partially mediated the relationship between autistic traits and social isolation and loneliness, the relationship between autistic traits and social isolation and loneliness persisted when accounting for their influence. Additionally, men were found to be at an increased risk of social isolation, while women were more likely to experience loneliness. Taken together, these findings highlight that people with high autistic traits in midlife and older age, particularly men, are at an increased likelihood of social isolation than their low autistic trait peers and that part of this may be related to poorer mental health and more adverse experiences. This highlights the need for additional help and support to mitigate the risk of social isolation and loneliness as people age. Further work is needed to see if this pattern of results extends to those with an autism diagnosis.

408.075 An All of Us Case Control Study Examining the Association between Dementia and Autism, ADHD, and Intellectual Disability

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Background: People with neurodevelopmental disorders (NDD; including autism, attention-deficit hyperactive disorder (ADHD), and intellectual disability (ID)) may be more likely to develop dementia than people without NDDs. Some studies have suggested that certain NDDs are associated with an increased risk of developing certain dementias. For example, Parkinson's disease may be more common in people with ADHD and autistic people than people without these conditions. Researchers have postulated this could be for several reasons, including genetic liability, pathophysiologic overlap between neurodevelopment and neurodegeneration, lower cognitive reserve, the presence of complex care needs that often go unmet, and differences in environmental exposures and stressors. As the population of people with autism, ADHD, and ID ages, it is important to understand their needs into older adulthood.

Objectives: To examine the association between NDDs and dementia/neurodegenerative diseases in a recent sample of adults in the U.S. from the All of Us Research Program.

Methods: Data for this study came from the All of Us Research Program (Controlled Tier Dataset V7), a longitudinal cohort study that combines electronic health records, surveys, laboratory assessments, physical measurements, and genetic data across a diverse set of adults in the United States supported by National Institutes of Health (NIH). Data was collected between May 1, 2018 and July 1, 2022. We conducted a nested case-control study to examine rates and risk of NDD in all participants with dementia in All of Us and a sex- and age-matched samples of adults without dementia. First, we examined the distribution of NDD and other covariates in the dementia cases and the matched controls. We then examined the same covariates within people with dementia stratified by NDD status. Finally, we used logistic regression models to examine the association of any NDD with dementia. We also separately examined the association of specific NDDs (autism, ADHD, and ID) with dementia.

Results: 7,275 adults were identified as cases, matched to 50,925 controls without dementia. Within dementia cases, 6.4% had an NDD, as did 2.0% of controls without dementia. ADHD was the most common NDD in dementia cases (5.5%), followed by ID (0.8%) and autism (0.5%). Just over half of cases and controls were female (53.7%) and the mean age was 74 years. People with any NDD had 3.4 times the odds of having a dementia diagnosis than did people without an NDD (95% CI 3.00, 3.83). When examining the association between individual NDDs and dementia, autistic people had 3.3 times the odds of a dementia diagnosis than people without autism (95% CI 2.89, 3.71). This was similar in people with ADHD and people with ID.

Conclusions: This national sample of adults from the U.S. identified a strong association of NDD diagnosis and dementia diagnosis, which was consistent across autism, ADHD, and ID. This finding supports the need for further research, policy, and funding into supporting these vulnerable groups. With an increased risk for dementia and an aging population, understanding care needs in people with dementia with an NDD is becoming increasingly important.

408.076 Individual, Service, and Environmental Risk Factors for Mental Health Hospitalization in Autistic Adults Enrolled in Medicaid

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Background: Mental health conditions are common in autistic adults, and when primary or outpatient treatment of mental health is not adequately addressed, behaviors may escalate to a level where hospitalization is needed. Mental health conditions are common reasons for inpatient hospitalization in autistic adults, with mood disorders (17%) and schizophrenia (9%) as the two most common reasons for hospitalization in autistic adults in 2017. This heightened rate of mental health hospitalization (MHH) compared to non-autistic peers may be driven in part by high co-occurrence of mental health conditions in autistic adults but is likely also due to inadequate care systems for autistic patients.

Objectives: The purpose of this study is to identify service patterns associated with MHH in autistic adults, and to discover if the predictors of MHH are different for autistic adults than non-autistic adults.

Methods: This study used Medicaid claims data from 2016-2019 focusing on people ages 14-64 enrolled in Medicaid for all four years. We examined the service use of four groups: autistic people with intellectual disability (ID; autism/ID), autistic people without ID (autism/no ID), people with ID without autism (ID), and people with neither autism nor ID. We examined receipt of mental health services in the year before MHH and compared to an age- and sex-matched sample that did not have a MHH in the same period. We included receipt of outpatient mental health care, emergency room visits, and psychotropic medication use as explanatory variables. We also examined the presence of mental health conditions that are commonly associated with increased risk of MHH, including schizophrenia and drug use disorders.

Results: Preliminary results are only from 2017; future work will look at 2018-2019. In 2017, 5.7% of people with autism/ID, 3.1% of people with autism/no ID, 4.0% of people with ID, and 1.8% of people without autism or ID had a MHH. People who had a MHH were more often white (56.7% versus 48.5% of those without a MHH) and female (27.5% versus 22.3%), and less often Hispanic (11.0% versus 19.5%) than those without a MHH. Most (93.1%) people with a MHH had an emergency department visit in 2016, as did 43.5% of those without a MHH. Controlling for demographic characteristics, having a mood disorder (OR 6.31, 95% CVI 6.06, 6.57), schizophrenia (OR 5.16, 95% CI 4.98, 5.33), or a drug use disorder (OR 3.79, 95% CI 3.65, 3.93) was associated with increased odds of MHH. People with ID (with or without autism) had 1.93 times the odds of MHH than people without ID (95% CI 1.87, 2.00). Future results will examine longitudinal patterns of service use, environmental characteristics, and psychotropic medication use on the risk of MHH.

Conclusions: Understanding the intervenable individual, service, and environmental factors that lead to MHH can help reduce emergency mental health care and shift the services focus to improving outpatient mental health care. Future work will examine follow-up care after a MHH, and how accessible mental health outpatient care can be improved to reduce readmission risk following a MHH.

408.077 Diagnostic Disclosure in Autistic Adults

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Background: After going through a diagnostic process and receiving an autism diagnosis, autistic people may choose to share their diagnosis with others. While clinicians are recommended to talk to the newly diagnosed person about the implications and concerns about the diagnosis and any future support needs, there is no advice about *how* clinicians should go about this. Accessing support post-diagnosis, such as reasonable adjustments under the Equality Act (2010), often requires an individual to disclose their diagnosis and it is therefore not only important that autistic people are receiving timely diagnosis, but also to be engaged in preparation to effectively communicate their diagnosis.

Objectives: To explore how autistic adults in the UK experience the process of disclosing their autism diagnosis to others. The study seeks to understand idiosyncratic contexts associated with decisions to disclose or not. It is interested in understanding where, why, and how, autistic people make sense of their experiences of disclosure following diagnosis in adulthood.

Methods: Interpretative phenomenological analysis was used to investigate autistic adults' experiences of disclosure. This approach facilitates detailed consideration of specific phenomena and has now been used widely in autism research. Twelve autistic adults participated in semi-structured interviews exploring their experiences of disclosure. Quality control procedures and reflexivity were used to ensure quality and reduce bias.

Results: Four group experiential themes emerged: "Functions of Disclosure" (Accessing Support; Becoming Myself; Activism and its Burden); "Approaching the Conversation" (Managing Disclosure and Reactions; Disclosure Started Pre-Diagnosis); "Negative Effects of Preconceptions" (Disbelief and Imposter Syndrome; Not Having My Needs Met; Caution and Avoidance), and "Acceptance, Openness and Finding Community". Our study demonstrates that autistic people disclose for the purpose of accessing adjustments, and to strive for support and understanding from others. However, for the autistic adults in our study seeking a diagnosis in adulthood also served an emotionally restorative function facilitating self-acceptance. As such disclosure was described as supporting being able to be more authentic and less dependent on masking.

Conclusions: Whether autistic adults disclose their diagnosis is a context dependent decision and is complex and challenging for autistic people to navigate. Disclosure could bring a sense of connection and being understood for autistic people and for some may represent an important act of self-acceptance and activism, though this can present a personal burden. Diagnostic disclosure may open opportunities for autistic people to access much needed support. However, other people's preconceptions of autism could lead to negative consequences, such as discrimination, that create barriers for autistic people to get their needs met and discourages further disclosures. Given the potential risks and benefit of disclosure, it is important that clinicians incorporate discussions about disclosure, including insights from experiences of others and consideration of potential consequences, as part of post-diagnostic support for autistic people.

408.078 Acceptability and Usability of the International Classification of Functioning (ICF) Coresets for Autism Platform Assessed By UK Autistic Adults

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Background: A diagnostic label of autism does not provide sufficient information to understand how the world is experienced by an Autistic person, their areas of strength or what support they may need. The International Classification of Functioning (ICF) Core Sets for Autism provides a framework from which a more in-depth understanding of an Autistic person's strengths and needs can be acquired.

Objectives: To assess the acceptability and usability of the ICF CoreSets for Autism platform to Autistic adults in the UK via supported and unsupported completion.

Methods: Study 1: 20 Autistic adults completed the ICF CoreSets for Autism assessment with researcher support and provided feedback via think-aloud interviews. Platform refinements were made based on feedback following which acceptability and usability were assessed in this cohort using the Theoretical Framework of Acceptability (TFA) and the System Usability Scale (SUS). Study 2: 464 Autistic adults and 481 Non-Autistic adults completed the ICF CoreSets for Autism assessment independently online and completed the TFA and SUS as well as providing written qualitative feedback.

Results: Study 1: Responses on the TFA indicated that Autistic adults generally found the assessment to be 'acceptable' (acceptability mean = 3.8/5). Responses on the System Usability Scale (SUS) indicated that usability was generally rated as 'ok' or better by most participants (SUS total mean = 61). Study 2: Responses on the TFA indicated that both groups generally found the assessment to be 'acceptable' (Autistic adults acceptability mean = 3.9/5; Non-Autistic adults acceptability mean = 4.2/5). Responses on the SUS indicated that usability was rated as 'ok' by Autistic adults (SUS total mean = 67) and 'good' by Non-Autistic adults (SUS total mean = 73). Scores on acceptability and usability were similar in the subsets of Autistic adults who had clinically relevant levels of autistic traits (AQ10 ≥ 6 ; acceptability mean = 3.9/5; SUS total mean = 67), anxiety (GAD7 ≥ 10 ; acceptability mean = 3.9/5; SUS total mean = 66) and depression (PHQ9 ≥ 10 ; acceptability mean = 3.8/5; SUS total mean = 66). Further, Autistic adults who were unemployed scored acceptability (acceptability mean = 4.0/5) and usability (SUS total mean = 66) similarly to those who were employed.

Conclusions: These UK studies suggest the ICF CoreSets platform for Autism has potential as an evidence-based tool to assess strengths and needs in Autistic adults. It is generally considered to be an acceptable assessment by Autistic adults, including those who currently express clinically relevant levels of depression, anxiety and in those who are unemployed. This assessment tool and platform may contribute to improving understanding of Autistic people's strengths and needs both at an individual and a group level and, if used to effectively inform post-diagnostic support, to increase participation in activities and society.

408.079 Understanding Suicide-Related Internet Use in Autistic Adults

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Background: Autistic people are a high-risk group for suicide but scant research to date has identified unique risk factors for death by suicide amongst autistic people. A recent study reported autistic mental health patients who died by suicide were more likely to have accessed suicide-related material on the internet than non-autistic patients (Bojanic et al., 2024). Research has yet to explain why this is the case and there is no guidance tailored for autistic communication styles to explain how to stay safe whilst seeking support online for suicidality.

Objectives: We aimed to understand: (i) differences in socioeconomic, clinical, suicidality characteristics and suicide-related internet use between autistic and non-autistic people; (ii) types of suicide-related internet use, motivations for suicide-related internet use and the effectiveness of online suicide prevention messaging.

Methods: We carried out an online survey of self-reported suicide-related internet use amongst mental health patients, including questions about socio-economic demographics, recent and historical diagnoses, hospitalisation and prescription, satisfaction with service provision, previous suicidal thoughts and attempts, life events, social support and suicide-related internet use.

Results: Participants were 696 mental health patients (68% aged between 25 and 44; 68% female, n=169 (28%) self-reported a formal diagnosis of autism). Autistic participants were more likely than non-autistic participants to: (i) be younger, aged 18 and 24 years of age; (ii) identify as gender diverse; and (iii) have been a victim of violence. Autistic participants who engaged in suicide-related internet (n=137, 81%) use were more likely, than those who did not, to (i) be unemployed; and (ii) experience insomnia. As shown in Figure 1, the most common types of suicide-related internet use were: (i) searching for suicide-related content (n=116, 85%); and (ii) interacting with others for reasons of suicidality (n=75, 55%). The most common motivations to engage in SRIU were: (i) seeking information or support for suicidality (n=87, 64%); and (ii) seeking information about suicide methods (n=78, 57%). There was no significant difference in suicide-related internet use between autistic and non-autistic participants. 68% (n=115) of autistic participants noticed online suicide prevention messaging, 41% had engaged with this by following links or calling phone numbers, which they reported experiencing as, on average, mildly harmful (median=6, IQR: 4-7.4).

Conclusions: Results offer the first preliminary findings regarding suicide-related internet use amongst autistic mental health patients. Our sample reflect widely reported greater gender diversity, interpersonal victimisation amongst autistic than non-autistic patients and more frequent formal autism diagnosis in younger autistic adult patients in line with historic changes diagnostic criteria. In line with previous studies in the general population, our findings suggest possible harms and benefits of suicide-related internet use in autistic and non-autistic patients. Future research could extend these findings to explore whether: (i) distinct factors contribute to harmful or beneficial suicide-related online activity; (ii) autism-specific factors, such as insomnia or unemployment, contribute to suicide-related internet use; and (iii) findings are consistent amongst those with and without formal autism diagnosis. Online suicide prevention messaging could be reviewed with autistic people to improve the experience and effectiveness of signposting.



Poster Session

409 - Brain Structure (MRI, neuropathology) I

May 1st, 2025, 5:30 PM - 6:30 PM - Hall 4A

409.080 A Normative Modeling Analysis of Cortical Sex Differences in Young Autistic Children

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Background: Autism is associated with significant differences between the sexes, with approximately 4 males diagnosed for every 1 female. Prevailing multifactorial liability models propose that males and females have different etiological thresholds to meet criteria for autism. The existence of a “female protective effect” in autism has been supported by both genetic and neuroimaging findings. Recently developed large-scale MRI models of neural development (i.e., normative modeling) offer a powerful framework to compare individual neuroanatomical measures against estimated population norms. Analogous to pediatric growth charts, normative modeling offers solutions to challenges presented by neural heterogeneity and classical case v control study designs making this methodology particularly well suited to test if autistic females experience greater differences in neuroanatomical structure than males.

Objectives: Following predictions of the multifactorial liability model, determine if measures of cortical thickness have greater differences from sex-specific peers in autistic females compared to autistic males.

Methods: This study included 257 (176 males / 81 females) autistic children ages 2-5 years. Cortical thickness was estimated using FreeSurfer 7.1.1 for 150 bilateral regions of interest (ROI). Each cortical reconstruction was visually inspected for quality with manual edits performed when required. For each ROI, lifespan trajectories of cortical thickness were modeled using Bayesian Linear Regression with likelihood warping leveraging MRI data from 88 sites (n=60,000; ages 2-100). Z scores, representing the degree of deviation from the normative model, were calculated for each individual ROI. Z scores were separated into positive (thicker cortex) and negative (thinner cortex) terms. Extreme deviations were defined as $Z > 2.6$ (positive values) and $Z < -2.6$ (negative values). Differences in the overall number of extreme deviations between autistic males and females were tested using non-parametric Mann-Whitney U tests. Additionally, differences in the proportion of extreme deviation in each ROI between autistic males and females were evaluated using permutation testing (n=10,000) and corrected for multiple comparisons using false discovery rate.

Results: Compared to autistic males, autistic females had significantly greater numbers of cortical ROIs with extreme negative deviations (male 0.82 v female 2.65, $p < 0.001$). A significant difference in the proportion of individual autistic males and females with an extreme negative deviation was found within the right inferior frontal gyrus, with 11.11% of autistic females and only 0.56% of males having an extreme negative deviation in this region (FDR $p = 0.01$). Males tended to have more ROIs with extreme positive deviations (male 1.85 v female 1.26, $p = 0.066$) although this difference did not reach statistical significance. After accounting for multiple comparisons, no additional ROIs had significant differences between the sexes in the proportion of individuals with an extreme deviation.

Conclusions: Greater numbers of extreme negative (thinner) cortical regions across autistic females as well as larger percentages of autistic females with such extreme deviations supports multifactorial liability models that indicate increased etiological load among autistic females that result in greater neuroanatomical differences for autistic females than males when compared to sex matched non-autistic peers.

409.081 Alterations in Trajectory of Large-Scale Brain Network Architecture in ASD during the Transition to Adulthood

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Background:

Previous evidence suggests that the brain's intrinsic connectivity networks may develop at different rates. These developmental network changes are reflected in gray matter morphometry and can be detailed using structural covariance. Alterations in structural architecture and connectivity of brain networks in autism spectrum disorder (ASD) have been reported previously; however, the development of these network differences has not been extensively studied. We applied structural covariance MRI (scMRI) to examine the developmental trajectory of network architecture in ASD from childhood into adulthood to determine when and where departures from typical development occur.

Objectives:

1. Identify alterations in the gray matter structure of intrinsic brain networks in ASD through the transition to adulthood
2. Examine the developmental trajectory of brain network differences in ASD, from adolescence into adulthood.

Methods:

We applied scMRI utilizing an existing longitudinal database of 188 males aged 11 to 35 years across 5 timepoints (834 scans). Structural MRI (MPRAGE) images were preprocessed and analyzed in SPM12. Data were binned by age (11 to 16, 16.1 to 20, over 20). To identify group and age differences in whole-brain covariance of gray matter, seed coordinates for network regions of interest (ROIs) were selected from known hubs of three large-scale networks implicated in ASD (default motor, executive control, and salience networks). We additionally probed cerebellar motor and cognitive covariance using previously reported motor and cognitive cerebellar regions. Signal intensities were extracted from 4-mm radius spherical seeds for each network hub ROI. For each age bin, one-sample t-tests were used to identify voxels with significant structural covariance with network seeds across participants for each diagnostic group across the entire brain, using total brain volume as a nuisance covariate. Group seed correlation maps were thresholded at family-wise error (FWE) corrected $p < 0.05$ and used to qualitatively compare across diagnostic and age groups.

Results:

Adults with ASD exhibited increased covariance between network seeds in the ECN and DMN with regions in the salience network (anterior insula and frontal operculum), as well as between ECN seeds and DMN regions and vice versa. Autistic adults also exhibited increased covariance between a motor region of the cerebellum (right lobule IV-V) and non-motor regions of the cerebellum and cerebral cortex that were not observed in typically developing adults. Right Crus II of the cerebellum, considered to be a cognitive region, also exhibited atypical covariance with cerebellar and cortical motor regions in autistic adults that was not seen in adult controls. Similar structural covariance deviations were also observed in autistic adolescents, although cerebellar alterations were not apparent before adulthood.

Conclusions:

1. Autistic adults exhibited structural covariance alterations in multiple large-scale brain networks involving the cerebral cortex and cerebellum.
2. Alterations in covariance between the ECN, DMN, and salience networks in ASD appear to persist in adulthood.
3. Our results suggest altered developmental trajectories and reduced segregation of cortical and cerebellar networks in ASD during the transition from adolescence to adulthood.

409.082 Altered White Matter Connectivity and Its Associations with Language Abilities in Young Children with Autism Spectrum Disorder

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Background: Previous diffusion tensor imaging (DTI) studies have identified differences in white matter tracts involved in language processing, such as the arcuate fasciculus (AF), inferior longitudinal fasciculus (ILF), superior longitudinal fasciculus (SLF), and inferior fronto-occipital fasciculus (IFOF) in children with autism spectrum disorder (ASD)^{1,2,3}. Recent studies have explored the alterations in white matter connectivity in ASD using a newly developed approach, Automated Fiber Quantification (AFQ)^{4,5}. AFQ can identify localized changes in specific tracts that may be missed in traditional tract-wise DTI analyses⁶⁻⁸. However, the impact of these alterations on language variability, especially in preschool-aged children with ASD, remains understudied.

Objectives: This study aimed to investigate early white matter alterations in eight major white matter fiber tracts associated with language functions in young children with ASD as compared to the typically developing (TD) peers at both tract-wise and point-wise levels.

Methods: We analyzed DTI data from 50 Chinese preschool children aged 1.5 to 6 years old, including 28 ASD ($n=28$, 3.24 ± 1.26 years) and 22 TD (2.97 ± 1.31) children. All ASD children met the DSM-V criteria for ASD as assessed by the ADOS (Module 1 or 2) or CARS, and all children completed the Chinese version of Gesell Development Schedule (GDS)⁹.

Diffusion-weighted imaging data were processed using the Python Automated Fiber Quantification (pyAFQ) tool⁴, which automates tractography, registration, segmentation, cleaning, profiling, and visualization. We focused on four DTI metrics—fractional anisotropy (FA), mean diffusivity (MD), radial diffusivity (RD), and axial diffusivity (AD)—across 100 nodes in eight language-related tracts: the left and right AF, ILF, SLF, and IFOF.

Lateralization indices (LI) for each DTI metric were calculated using $(R - L) / (R + L)$, and one-sample t -tests were performed to assess the LI for each DTI metric in both groups. Two-sample t -tests compared LI between groups. We compared each DTI metric between the TD and ASD groups at both the tract-wise (mean across 100 nodes) and point-wise levels, controlling for age and gender. Relationships between each DTI metric and language scores were examined separately in the ASD and TD groups, along with correlations between DTI metrics and symptom severity in ASD.

Results: Our results revealed significant lateralization patterns within both groups, though no significant between-group differences in lateralization were observed (Figure 1A-D). ASD and TD groups showed different patterns in correlations between white matter lateralization and language abilities (Figure 1E-F). While no significant group differences were detected through tract-wise comparisons of DTI metrics, point-wise analyses revealed localized differences in FA, MD, RD, and AD between groups. These localized alterations were strongly associated with language abilities, showing distinct patterns in each group (Figure 1G). Furthermore, we identified significant correlations between DTI metrics and the severity of ASD symptoms (Figure 1H-I).

Conclusions: These findings suggest that microstructural changes in white matter play a critical role in both language abilities and symptom severity in ASD, offering potential avenues for further research and intervention strategies.



409.083 An Exploration into the Sensory Brain Structures in Infants with a Higher Likelihood of Neurodevelopmental Conditions

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Background:

Sensory difficulties have recently been recognised as a core difficulty of Autism Spectrum Conditions (ASC) with up to 90% reporting sensory issues (Robertson et al., 2017) and other neurodevelopmental conditions (NC's). Recent Magnetic Resonance Imaging (MRI) research have provided evidence in adulthood suggesting neuroanatomical differences in sensory regions in ASC (Habata et al., 2021). However, adult studies make it difficult to untangle the primary and secondary consequences of living with ASC. Studies of infants with a first degree relative of NC's are more likely to receive a later diagnosis and provide an opportunity to examine sensory brain development prior to emerging behavioural symptoms. As sensory features are among the earliest signals of ASC in infancy, the development of sensory systems in the postnatal period is crucial to understand.

Objectives:

We tested the hypothesis that the volume of key sensory brain regions may differ at birth in neonates with and without a first degree relative with a neurodevelopmental condition.

Methods:

91 neonates underwent T2 weighted sequences on a 3T MRI scanner. 36 infants (n=22M and 14F) born (M=39.02, SD=1.94) and scanned (M=42.09, SD=1.81) were classified as higher likelihood (HL) of neurodevelopment infants. 55 infants (n=25M and 30F) born (M=39.80, SD=1.32), scanned (M=42.31, SD=1.40) were classified as lower likelihood (LL) with no family history of neurodevelopment conditions. Neonates with significant physical health condition and/or clinically relevant incidental MRI brain anomaly were excluded.

12 sensory volumes were examined including the precentral (PRG) (movement) and postcentral gyrus (POG) (touch), supplementary motor (SMC) and olfactory cortex (smell), the inferior, middle and superior occipital lobes (OL) (visual), superior temporal gyrus (STG) (auditory), insula, thalamus, hippocampus and amygdala. ANOVAs were run on individual sensory regions of interest, with total brain tissue volume, gestational age (GA) at birth, GA at scan, biological sex and biological sex*likelihood as co-variables.

Results:

There were no significant between group differences in biological sex, age at birth and age at scan. The results revealed no differences between HL and LL sensory volumes. However, interaction effects revealed significant differences between the HL male (M= 4901.4, SD= 859.2) and female (M= 4943.3, SD= 600.5) right postcentral gyrus ($p=0.025$). We also found significant differences between the HL male (M= 7797.5, SD= 1405.6) and female (M= 7659.9, SD= 1361.0) in the right precentral gyrus ($p=0.09$). However, this did not survive multiple comparisons.

Conclusions:

Our preliminary findings revealed no significant differences when comparing HL and LL sensory region-of-interest volumes. However, interaction effects between biological sex and likelihood group revealed larger POG in HL females compared to males and larger PRG in HL males compared to females. Although this did not survive multiple comparisons, these findings suggest biological differences may drive sensory development specifically within neurodevelopmental conditions as early as birth. As the POG is responsible for touch and the PRG for movement, these early findings may indicate differences in touch perception and motor movement in males and females with neurodevelopmental conditions. However, this warrants further examination of the developmental sensory trajectory.

409.084 Cortical-Thickness-Based Machine Learning Model for Diagnosing Autism: Investigation of Systemic Error and Feature Importance

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Background: There has been an increasing effort to establish classification models for autism based on brain imaging data. Although the potential for creating an objective biomarker from this data is significant, these models' explainability and systemic errors remain largely under-investigated. **Objectives:** This study aims to train models using cortical thickness data from individuals with autism and typically developing comparisons while investigating systemic error and establishing feature importance through explainable artificial intelligence.

Methods: Structural MRI data from 162 autistic participants (94.4% male, mean age $\pm$ SD: 13.4 $\pm$ 2.6 years) and 227 typically developing comparisons (70% male, mean age $\pm$ SD: 12.2 $\pm$ 2.9 years) were processed with Freesurfer to extract cortical thickness data parcellated by the Destrieux atlas. One hundred fifty variables from the left and right hemispheres were used as training features for various classification models, including support vector machines, random forests, K-nearest neighbors, linear discriminants, neural networks, decision trees, and XGBoost. We compared correct and incorrect classifications of autistic participants based on their sex, age, IQ, emotional and behavioral symptoms from the Child Behavioral Checklist (CBCL), and comprehensive autistic features assessed through standardized evaluation tools. The average SHAP (SHapley Additive exPlanations) values for each feature from the best-performing model were calculated to provide insights into the explainability of the machine learning models and identify potentially important features.

Results: Our classification model achieved high accuracy, with the XGBoost model yielding an area under curve (AUC) of 0.883, sensitivity of 0.822, and specificity of 0.781. In contrast to our previous study on behavioral data, the errors from the brain image-based model did not correlate with emotional or behavioral problems. Furthermore, these errors did not correlate with age or sex. However, they were associated with a wide range of autistic features and verbal IQ (VIQ), indicating that autism-specific brain patterns could serve as potential biomarkers for diagnosis. We identified the top 15 brain regions with the highest average SHAP values. Notably, the top four regions—right superior segment of the circular sulcus of the insula, right short insular gyri, right posterior ramus of the lateral sulcus, and right intraparietal sulcus and transverse parietal sulci—exhibited both the highest SHAP values and the best discrimination between autistic participants and comparisons.

Conclusions: Our findings suggest that classification models based on brain imaging can function as objective aids in the diagnosis of autism. These models demonstrate error patterns distinct from those based on behavioral data, offering crucial insights for their clinical use across diverse symptom profiles. Furthermore, the brain regions identified as top discriminators warrant additional exploration to enhance our understanding of brain-behavior relationships and identify potential therapeutic avenues.



409.085 Diffusion Weighted Imaging of the Anterior Cingulate Cortex in Toddlers and Preschoolers with Autism Spectrum Disorder
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Background: Postmortem studies in autism spectrum disorder (ASD) have identified cytoarchitectural differences in the anterior cingulate cortex (ACC) including increased cell packing density, laminar disorganization, and alterations in the ratio of short- vs long-distance axons beneath the ACC. Established associations between ACC and executive function suggest that these cytoarchitectural differences may contribute to co-occurring executive deficits in ASD. Alterations to ACC structure, function, and connectivity have also been associated with increased restricted and repetitive behaviors in ASD, with both ACC u-fiber volume and FA of the underlying WM negatively associated with RRB in independent studies. While diffusion-weighted imaging (DWI) is most commonly applied to studies of white matter, it is also sensitive to differences in gray matter microstructure.

Objectives: (1) To investigate gray matter microstructure (using DWI) in anterior cingulate cortex in toddlers with and without ASD; (2) To test for associations with executive function.

Methods: A sample of 34 toddlers and preschoolers aged 18-64 months (22 with ASD, 12 typically developing [TD]; mean age 42.56±13.80 months) were examined. ASD diagnoses were verified through clinical best estimate of DSM-5 criteria supported by the ADOS-2. The Mullen Scales of Early Learning assessed developmental skills and the Behavior Rating Inventory of Executive Function-Preschool (BRIEF-P) assessed executive function. T1-weighted and DWI scans were collected during natural nocturnal sleep. Rostral anterior and caudal anterior regions of interest (ROI) were identified bilaterally using FreeSurfer and the Desikan-Killiany atlas. Fractional anisotropy (FA) and mean diffusivity (MD) were averaged for each ROI using FSL software. Linear regression models tested for effects of age, diagnosis and their interaction for each ROI, and correlations tested for associations between ACC microstructure and executive function in the ASD group.

Results: Groups were matched on age, intracranial volume and image quality. FA significantly decreased with age in left caudal and right rostral ACC, while MD significantly increased in all ROIs. Diagnosis and age-by-diagnosis effects were not significant for FA or MD in any ROI. A significant correlation between right caudal ACC MD and higher (less proficient) BRIEF-P *Shift* t-scores ($r = .508, p = .031$) was found in the ASD group but didn't survive correction for multiple comparisons. No other significant correlations were found between DWI measures and BRIEF-P subscores in the ASD group.

Conclusions: Age trajectories of FA and MD were typical for developing gray matter as dendritic trees continue to expand in childhood. Although group effects were not significant when controlling for age, means were in the expected direction and consistent with previous findings from our group in older children and adolescents. That earlier study suggested elevated MD and decreased neurite density (using a multi-compartmental model) in the ACC, parietal lobe, and right superior temporal lobe, findings that align with the altered ACC cytoarchitecture found in postmortem studies. A correlation between higher right caudal ACC MD and greater impairment in task shifting did not survive FDR correction. A larger sample size is needed to detect potentially subtle effects, and application of a multicompartmental model (in progress) may provide greater sensitivity.

409.086 Elevated Extra-Axial CSF Volumes in Angelman Syndrome: Extending Beyond Autism to a Neurogenetic Syndrome
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Background: Previous studies have demonstrated that young children with idiopathic autism have atypically enlarged volumes of extra-axial cerebrospinal fluid (EA-CSF) and an increased ratio of EA-CSF to brain volume, suggesting that EA-CSF is disproportionately increased beyond the brain enlargement often observed in autism. It is unknown whether enlarged EA-CSF is present in selected genetically-defined syndromes with shared and distinct features of autism. Angelman syndrome (AS) is a neurogenetic syndrome caused by loss of function, mutations, or deletions of the maternal *UBE3A* allele. AS shares some phenotypic features with autism (increased incidence of intellectual disability, seizures, and sleep problems) but is also characterized by microcephaly. Studying AS will provide insight into whether EA-CSF volume is disproportionately enlarged in a neurodevelopmental syndrome with smaller head size.

Objectives: This study aimed to investigate differences in total cerebral volume (TCV) and EA-CSF volume between children with AS and neurotypical (NT) children, as well as the relationship between EA-CSF, sleep, and seizures in AS.

Methods: We acquired high-resolution structural MRI scans in N=29 children with AS (18 males, 11 females; M[SD] age = 6.08 [2.14] years) and N=27 NT children (23 males, 4 females; M[SD] age = 7.96 (2.24) years). We collected the Children's Sleep Habits Questionnaire (CSHQ) to measure sleep quality and the Early Childhood Epilepsy Severity Scale (E-Chess) to evaluate seizure severity in the AS group. ANCOVA was employed to compare TCV and EA-CSF between AS and NT groups, controlling for age, sex, and interactions with group. The relationships between EA-CSF, sleep, and seizure problems in AS were analyzed using linear regression.

Results: AS children had significantly smaller TCV (24% difference) compared to NT individuals ($F_{1, 50} = 195.96, P < .0001$). Despite having much smaller brain volumes, the AS group had nearly equivalent EA-CSF volumes to the NT group ($F_{1, 50} = 0.91, P = .35$). The ratio of EA-CSF to TCV was 39% higher in AS, indicating that AS children have disproportionately high volumes of EA-CSF relative to brain volume ($F_{1, 50} = 24.49, P < .0001$). Higher EA-CSF in AS was significantly associated with problems initiating sleep ($P = .002; t_{15} = 3.79$) and the severity of seizures ($P = .032; t_{14} = 2.38$).

Conclusions: Similar to what has been reported in young children with autism, this study indicates that children with AS have atypically higher EA-CSF volume than would be predicted by their smaller brain size. Elevated EA-CSF volumes in children with AS were associated with sleep problems and seizures, which significantly impact quality of life and are key outcome measures in current clinical trials to reactivate the *UBE3A* allele. Excessive CSF suggests the possibility that CSF circulation is impaired in AS individuals, which would have important implications for current genetic therapies delivered via CSF intrathecally. We are currently analyzing MRI data in age- and sex-matched individuals with autism to compare with idiopathic autism, AS, and neurotypical controls.



409.087 Enhancing Multimodal Neuroimaging Classification in ASD Using Alternating Diffusion Mapping

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Background:

Incorporating multiple modalities into machine learning (ML) analyses is an emerging challenge in scientific exploration. Multimodal data collection is becoming increasingly more common, and complex developmental conditions like ASD can be better understood by synthesizing the complementary information provided by multimodal data. Alternating diffusion mapping (ADM) is a manifold learning algorithm that combines the lower dimensional embeddings from separate modalities into a unified matrix for ML. The benefit of this technique is twofold: intrinsic structure of each modality is preserved, and commonalities between modalities are highlighted. Thus, the low dimensional embeddings resulting from ADM represent the union of the multimodal components.

Objectives:

The objective of this analysis is to evaluate ADM's effectiveness in identifying salient differences between autistic and non-autistic individuals. To do so, we utilize volumetric brain data as the first modality and phenotypic survey data as the second modality. These two modalities are particularly well-suited for this task, as the literature suggests we should expect poor cohort-wise classification accuracy on the volumetric data alone and good classification accuracy on the phenotypic data alone. Improved classification accuracy on the ADM-fused data is the true test of this method.

Methods:

Participants included 312 individuals (162 female; mean age=151.32 months). 144 were autistic (68 female; mean age=151.17), and the remaining 168 were non-autistic controls. Volumetric data included the 168 Destrieux atlas regions preprocessed by dividing by intracranial volume. Phenotypic data included domain subscales from several behavioral measures: DAS-II, Vineland-II, SRS, RBS-R, BRIEF-II, and CBCL (42 total). Missing phenotypic data were imputed to maintain sample size. Each modality was scaled and centered such that predictors had means of zero and variances of one. Samples were split into training/testing sets, diffusion mapping was implemented on each modality separately, and cohort-wise classification accuracy was assessed using SVM. ADM was then implemented on both modalities and classification accuracy was reassessed.

Results:

Overall classification accuracy for volumetric data was 52.44% (autistic: precision=0.49, recall=0.97, F1-score=0.65; non-autistic: precision=0.86, recall=0.14, F1-score=0.24). Overall classification accuracy for phenotypic data was 87.30% (autistic: precision=0.82, recall=0.93, F1-score=0.87; non-autistic: precision=0.93, recall=0.82, F1-score=0.87). Overall classification accuracy for the fused data was 90.48% (autistic: precision=0.87, recall=0.93, F1-score=0.90; non-autistic: precision=0.94, recall=0.88, F1-score=0.91).

Conclusions:

The overall results suggest that ADM was effective for fusing multiple modalities together due to the increase in classification accuracy from the phenotypic data alone. Phenotypic surveys chosen for this analysis are designed to assess proficiency in various developmental domains, which explains the high accuracy in these data individually. Notably, these findings indicate that complementary information can be extracted from data sources that are seemingly less important independently: differences in brain volume between autistic and non-autistic individuals are not well-supported in the literature, a finding corroborated here by the poor classification accuracy of volumetric data alone. However, the improvement in accuracy after multimodal fusion implies that latent information shared between modalities helps ML algorithms distinguish between diagnostic groups. Further investigation into fusing other modalities, such as time-series modalities like EEG and fMRI, has the potential to uncover more complementary information unique to ASD.

409.088 Evaluating Deep Learning Methods for the Correlation of Motion Artifacts Correction in Structural MRI Scans

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Background:

Magnetic Resonance Imaging (MRI) is a key non-invasive tool for studying brain anatomy, functioning, and connectivity in mental health conditions^[1]. On the downside, participant movement during MRI scanning can lead to image distortions such as blurring and ringing, which in turn can compromise overall data quality^[2]. This particularly applies to data coming from individuals with mental health conditions that are more sensitive to noise, or find it hard to lay still (e.g., ADHD individuals). While deep learning approaches are constantly being developed in a bid to reduce the long processing times^[3], or to enhance the resolution of low-field data^[4], the applicability of such approaches in correcting motion artifacts is yet to be validated.

Objectives:

In this current project, we aimed to 1) evaluate the accuracy of three AI-based methods to reduce motion artifacts, and 2) assess their potential impact on improving overall data.

Methods:

N=359 autistic individuals aged 6-30 (101 females, 258 males) underwent structural Magnetic Resonance Imaging (MRI) at 6 different sites^[5] using 3T head-scanners. T1-weighted images were assessed, edited, and processed using FreeSurfer v6.0.0 (<http://surfer.nmr.mgh.harvard.edu/>). Out of this sample, we retrospectively examined 65 pairs of motion-affected and motion-free images of the same participants. The high-quality scans served as the 'ground truth', to which the results of different AI-based pipelines were compared in order to evaluate their accuracy. The AI-based alternatives included: FastSurfer^[3], recon-all-clinical^[6-9], and SynthSR^[9,10] followed by the standard recon-all pipeline of FreeSurfer. The outputs of the three pipelines were compared at the vertex level. Additionally, we used the fsqc tool (<https://github.com/Deep-MI/fsqc>) to assess the quality of the reconstructions in terms of surface holes, defects, and signal-to-noise ratio.

Results:

All three pipelines produced comparable surface-based data that was highly correlated with the default pipeline applied to the reference scans. The highest spatial correlation was obtained for measures of cortical thickness (CT) with FastSurfer (mean spatial correlation=0.94 with a smoothing kernel of 15, see Fig 1A). SynthSR, on the other hand, produced the most reliable data for measures of surface area (SA) (mean=0.95 with a smoothing kernel of 10, see Fig 1B). There were no major differences in specific areas of the difference maps for both the CT and SA measures, comparing the resulting surfaces to those from the standard process (see Fig 1C-D). Last, SynthSR provided the highest increase in signal-to-noise ratio pre-normalization in both grey and white matter. It also significantly decreased the numbers of surface holes and defects in both hemispheres (see Fig 2).

Conclusions:

Our findings suggest that the deep learning approaches can reliably be used to salvage images that would have been otherwise discarded because of their poor quality. Notably, SynthSR appears to be producing comparatively high correlations while also enhancing image contrast and repairing surface defects without producing any changes in image orientation. This makes these techniques particularly well suited for studying the brain anatomy in neurodiverse study populations, and provide an opportunity to save resources and potentially avoid having to repeat the scanning procedure several times until high-quality images are achieved.



409.089 Immune Alterations at Brain Borders in Autistic Adults Revealed By Neuroimaging

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Background:

Immune mechanisms have been associated with the pathophysiology of autism spectrum disorder (ASD), based on preclinical and epidemiology work (Careaga et al., 2017, Tiroleco et al., 2021). Recent studies have identified regions bordering the brain, such as the choroid plexus and skull, as key regulators of immune responses in central nervous system, (reviewed in Castellani et al., 2023). Positron emission tomography (PET) with the radiotracer [¹¹C]PBR28 allows for the *in vivo* measurement of translocator protein (TSPO), a mitochondrial protein involved in immune functions in humans. Translocator protein levels have not yet been assessed at brain borders in autistic adults.

Objectives:

Assess whether TSPO levels are altered in the choroid plexus and skull in autistic adults compared to age- and sex-matched controls (CON) using simultaneous [¹¹C]PBR28 PET and magnetic resonance imaging (MRI).

Methods:

Thirty-eight autistic adults (26 males, 12 females) and 29 age- and sex-matched healthy controls (19 males, 10 females) completed a [¹¹C]PBR28 PET-MRI scan. [¹¹C]PBR28 PET data from 60-90 minutes post radiotracer injection were reconstructed into standardized uptake value (SUV) normalized by a pseudo-reference region (SUVR). The choroid plexus region of interest (ROI) was manually segmented for all participants. The skull ROI was derived from an MRI-based pseudo-computed tomography image and segmented into frontal, parietal, temporal, and occipital regions. [¹¹C]PBR28 SUVR was extracted from subject space for the choroid plexus and skull. Multivariable linear regression models were used to test group differences while controlling for age, sex, and TSPO genotype and to assess group-by-sex interactions while controlling for age and TSPO genotype.

Results:

For the choroid plexus, elevated TSPO was observed in autistic females compared to CON female (p=0.01), but no alteration was seen in autistic males. For the skull, elevated TSPO was seen in the frontal (p<0.05) and temporal (p=0.03) lobar skull regions in autistic adults compared to age- and sex-matched CON.

Conclusions:

Elevated TSPO in the choroid plexus and skull in autistic adults *in vivo* suggests immune alterations at brain borders, which are areas increasingly understood as key immunological niches. Some of the elevations seen were sex-specific, such as the TSPO elevations in the choroid plexus which was seen in autistic females only. Overall, these regional elevations in TSPO density suggest that immune processes in regions bordering the brain should be further investigated in autism spectrum disorder.

409.091 Localized Mapping of White Matter Microstructural Alterations in Autism Using Advanced Tractometry

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Background: Previous diffusion magnetic resonance imaging research (dMRI) in autism has reported altered white matter microstructure, but the affected white matter regions are inconsistently reported across studies, hindering our understanding of the brain in autism. These conflicting results may be due in part to limitations of commonly used dMRI analytic techniques or small sample sizes. The traditional microstructure model, diffusion tensor imaging (DTI), cannot resolve crossing fibers. Conventional dMRI analysis methods such as tract-based spatial statistics (TBSS) and tractography averaging across large portions of the tract are limited by skeletonization biases or poor spatial specificity, which can obscure subtle, localized differences. The tensor distribution function (TDF) model addresses limitations of DTI by fitting a continuous mixture of tensors at every voxel, modeling complex fiber orientations. The novel tractometry method, BUⁿdle ANalytics (BUAN), extracts individual white matter tracts as 3D models and yields fine-grained maps of white matter differences.

Objectives: Precisely map white matter microstructure alterations in autism within commissural and association tracts using the advanced microstructure model, TDF, and the novel tractography-based approach, BUAN.

Methods: We analyzed single-shell 3D dMRI scans from 365 participants (5-25 years; 34.0% females; 195 with autism) from 10 sites/scanners (7 NIMH Data Archive sites and 3 Autism Brain Imaging Data Exchange sites). Standard preprocessing included eddy current and distortion correction. A TDF-derived measure of fractional anisotropy (FA^{TDF}) was computed at each voxel, along with standard DTI metrics of fractional anisotropy (FA^{DTI}), and mean, axial, and radial diffusivity (MD, AD, RD). Whole-brain tractograms were generated using constrained spherical deconvolution (CSD) and local deterministic tractography (Figure 1). The auto-calibrated RecoBundles method was used to extract 9 standard commissural and association tracts. BUAN was then used to divide each tract into 100 segments and compare microstructural metrics between the autism and neurotypical groups. Nuisance covariates included age, de-meaned age squared, sex, full-scale intelligence quotient, subject, and site/scanner. The false discovery rate was applied for multiple comparisons correction.

Results: Microstructural alterations in autism were detected in localized regions of almost every tract examined; representative tracts and metrics are displayed in Figure 2. Overall, there was lower white matter integrity (FA^{TDF} , FA^{DTI}) and elevated diffusivity (MD, RD) across tracts. For commissural tracts, the *forceps minor* and midbody of the corpus callosum exhibited localized differences specifically in the central portion of the tract. For the *forceps major*, differences were specific to the lateral portions of the tract. For association tracts, significant differences were localized to the frontal projections for the arcuate and uncinate fasciculi. By contrast, for inferior fronto-occipital, inferior longitudinal, and middle longitudinal fasciculi the significant differences were more specific to the posterior or middle portions of each individual tract.

Conclusions: Our study using advanced dMRI methods indicates that white matter microstructure alterations in autism are detectable across diverse brain regions in a spatially-specific manner. These findings demonstrate the importance of considering widespread brain regions and nuanced differences therein to improve our understanding of the neural mechanisms underlying autism.

**409.092** Myelin Water Fraction and Relaxation Time Differences in Orienting Attention-Related Regions and Their Association with Social Behaviors in Autism

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Background: While increasing evidence suggests widespread white matter microstructure alterations in autism, there is limited research on direct assessments of myelin in this population. Multicomponent relaxometry may provide a more specific assessment of myelin content through the myelin water fraction (VF_M). To date, only one study (Deoni et al., 2015) has used voxel-wise comparisons of VF_M in autism, revealing lower VF_M in autistic individuals in comparison to neurotypical individuals. The present study aims to investigate VF_M , along with quantitative relaxation-time estimates (T_1 , T_2), in white matter tracts involved in orienting attention (the corpus callosum [CC], cingulum, superior longitudinal fasciculus [SLF], and uncinate fasciculus [UF]; e.g., Dowe et al., 2020; Elison et al., 2013; Murray et al., 2016; Niogi et al., 2010), which is closely linked to social communication difficulties in autism.

Objectives: This study aims to: (a) examine whether VF_M , T_1 , and T_2 in the CC, cingulum, SLF, and UF differ between autistic and neurotypical individuals, including age-related group differences; and (b) explore whether these alterations are associated with parent-reported social behaviors (Social Responsiveness Scale [SRS]) in autistic individuals.

Methods: Imaging data were acquired from 48 autistic (92% male; $M_{age} = 16.3$; 5 to 42 years) and 71 neurotypical individuals (94% male; $M_{age} = 15.8$; 5 to 33 years) using mcDESPOT, a multicomponent relaxometry technique (Dean et al., 2014, 2016; Deoni et al., 2008). ANCOVA and multiple regressions were conducted to address the two aims, respectively, controlling for age in all analyses. A false discovery rate (FDR) correction (Benjamini & Hochberg, 1995) was applied to adjust for multiple comparisons.

Results: No significant group differences were found for VF_M . However, uncorrected results showed greater VF_M in the genu of the CC ($p=.045$) and SLF (right, $p=.022$; left, $p=.050$) in the autism group. T_1 was lower in the autism group in the CC (genu, $p=.040$; body, $p=.049$; splenium, $p=.046$), cingulum hippocampus (right, $p=.049$; left $p=.049$), and SLF (right, $p=.044$; left $p=.040$). There were no significant differences in T_2 or age-by-group interactions across VF_M , T_1 , and T_2 . Associations between SRS scores and VF_M , T_1 , and T_2 were found only at the uncorrected level. Specifically, mother-reported SRS-Social Cognition was positively associated with T_2 in the right UF ($p=.050$), while father-reported SRS-Social Motivation was negatively associated with T_2 in the genu ($p=.044$) and body of CC ($p=.039$). Additional associations were found for SRS-Social Communication across both parent reports, with varying patterns across regions.

Conclusions: Our findings suggest that myelination may not be a factor contributing to the differences in orienting attention between autistic and neurotypical individuals. In addition, myelin and tissue maturation may not differ between these groups. The results, particularly for T_1 , add to the mixed findings from relaxometry studies in autism. Although associations with social behaviors did not survive correction for multiple comparisons, the initial uncorrected results indicate a need for further investigation. Future studies may consider using more sensitive or objective measures of social behavior and orienting attentional mechanisms, as well as larger sample sizes, to clarify these relations.



409.093 Neuroanatomical Correlates of Adaptive Outcomes in Autism

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Background:

Autism is a common neurodevelopmental condition that is characterized by differences in social communication and interaction (SCI), restricted, repetitive, and stereotypical behaviors (RRB) and atypical sensory processing (ASP). These core symptoms are accompanied by neurodevelopmental variations in cortical thickness (CT)[1]. Typically, increased symptom scores are associated with decreased adaptive functioning, such as communication, daily living skills, socialization, and motor skills [2]. However, some individuals display a high level of adaptive functioning despite a high prevalence of autism symptoms and traits [3].

Objectives:

The aim of this study was therefore to investigate the neuroanatomical correlates of 'adaptive resilience/ vulnerability', where resilience is defined as a higher than expected adaptive outcome and vulnerability is defined as a lower than expected outcome as would be predicted based on symptom severity metrics.

Methods:

N=359 autistic individuals, aged 6-30 years (101 females, 258 males) underwent structural MRI-scanning at 6 sites [4] using 3T head-scanners. CT was extracted from T1-weighted images using FreeSurfer v6.0.0 (<http://surfer.nmr.mgh.harvard.edu/>). Adaptive Functioning was assessed using the Vineland Adaptive Behavior Scale (VABS)[2]. Symptom severity was measured using the Social Responsiveness Scale [5], Repetitive Behavior Scale Revised [6], and Short Sensory Profile [7]. To quantify interindividual differences in adaptive resilience, measures of symptom severity were regressed onto the VABS, controlling for age and IQ [8]. To quantify adaptive resilience/ vulnerability, we computed residuals from the predicted VABS scores using the three measures of symptom severity, controlling for age and IQ. Residuals were then mapped onto the brain by regression of a general linear model (GLM) with sex, age, IQ, site, and mean CT as covariates.

Results:

As expected, increased symptom severity was associated with decreased adaptive functioning across behavioral domains overall (see Fig. 1A). More positive residuals (i.e., higher than expected VABS scores) were associated with decreased CT in left middle frontal gyrus, pars opercularis, and pars triangularis (see Fig. 1B). On a behavioral level, more positive residuals were significantly reflected by increased mean resilience scores on the Child Health Illness Profile (CHIP), and increased scores on the Strength and Difficulty Questionnaire (SDQ) prosocial scale (see Fig. 1C). In addition, more positive residuals were accompanied by decreased subscores on the Autism Diagnostic Interview Revised (ADI-R) (see Fig. 1C).

Conclusions:

These results are in line with previous research showing that increased resilience is associated with decreased CT in the left prefrontal lobe, which in turn suggests that adaptive resilience may have neurodevelopmental origins [9]. The prefrontal lobe is crucial for social cognition, language production, and processing, which have previously been linked to social communication difficulties in autism [10, 11]. Understanding the neuroanatomy and ultimately the molecular mechanisms that underpin atypical brain development in these regions may help to develop targeted and personalized support and interventions, and provide novel insights into the neurobiology of adaptive resilience.

**409.094 Neurodevelopmental Subgroups in Autism: Structural Brain Feature Clustering and Age-Related Trajectories**

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Background: Autism encompasses a wide range of clinical phenotypes, yet the neurobiological underpinnings of this variability remain poorly understood. Emerging evidence suggests that autism may not be a singular condition but rather a collection of neurodevelopmental subtypes with distinct patterns of brain structure and function. Identifying such subgroups could be pivotal for advancing personalized treatment and assistance strategies and improving the accuracy of prognostic assessments. This study investigates whether subgroups of autistic males can be delineated based on structural brain characteristics and whether these subgroups exhibit differential neurodevelopmental trajectories over time.

Objectives: The primary aim of this research is to elucidate potential neurodevelopmental subtypes within the autistic male population by analyzing structural brain metrics, including gray matter volume, subcortical volume, cortical surface area, and cortical thickness. We hypothesize that hierarchical clustering will reveal distinct neuroanatomical subgroups with unique age-related developmental trajectories, potentially informing individualized therapeutic approaches. A secondary aim is to assess the clinical relevance of these subgroups by examining how their trajectories diverge across developmental periods.

Methods: This study utilizes structural magnetic resonance imaging (MRI) data from 307 males with ASD, aged 7 to 45 years, sourced from the ABIDE I dataset. Four neuroanatomical metrics were extracted: gray matter volume across 90 cortical regions, subcortical volume across 14 regions, cortical surface area across 70 regions, and cortical thickness across 70 regions. Hierarchical clustering was employed to identify subgroups within each feature set, with subsequent trajectory analysis conducted using Ensemble Empirical Mode Decomposition (EEMD). EEMD is a non-linear decomposition technique that enables the identification of intrinsic age-related changes in brain structure.

Results: The analysis identified discrete subgroups within the autistic cohort, with three subgroups emerging for both gray matter volume and cortical thickness, and two subgroups for subcortical volume and cortical surface area. Notably, each subgroup exhibited distinct neurodevelopmental trajectories. For instance, one whole-brain gray matter subgroup demonstrated a progressive reduction in brain volume with age (blue trend line in the figure), while another maintained stable volume across the lifespan (red trend line in the figure). A third subgroup exhibited an initial increase in gray matter volume during childhood, followed by a decline in later adulthood (black trend line in the figure). These findings reveal substantial heterogeneity in brain development trajectories among autistic individuals, suggesting the presence of neurobiologically distinct subtypes.

Conclusions: The identification of neuroanatomical subgroups within the autistic male population, each characterized by unique age-related trajectories, represents a significant advancement in understanding the neurobiological diversity of autism. These results highlight the need for precision assistant approaches in autism, where interventions and assessments are tailored to the specific neurodevelopmental profiles of individuals. The potential clinical implications of these findings are profound, offering a pathway to more personalized therapeutic strategies and refined prognostic tools. Future work will expand these analyses to female autistic populations and explore the translation of subgroup findings into clinical practice.



409.095 Perinatal Brain Growth and Autistic Traits in Toddlerhood

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Background: Autism is a heterogeneous set of neurodevelopmental conditions with a significant heritable component and perinatal origins. The earliest observable behavioural traits with which a diagnosis can be made emerge at 18 months of age. Previous studies have reported increased brain growth in infancy in autistic children, but less is known about their early brain development in the first 6 months of life – a critical period for brain development.

Objectives: To investigate if perinatal brain structure and growth are associated with autistic traits at 18 months.

Methods: Data from two independent cohorts, the developing Human Connectome Project (dHCP) and Cambridge Human Imaging and Longitudinal Development (CHILD), were assessed in late fetal and early infancy for brain structure with MRI. Global and regional brain volumes in the dHCP, were studied prenatally (mean age=29.27 [SD=3.8] weeks post-conception) and postnatally (mean age=41.28 [SD=1.93] weeks post-conception) and correlated with autistic traits measured after 18 months of age by the Quantitative Checklist for Autism in Toddlers ('Q-CHAT'). Nominally significant findings were further tested for association in the smaller independent CHILD cohort, where pregnant mothers were scanned during pregnancy (mean=31.98 weeks gestation, SD=1.52) and postnatally (mean scan age=50.45, SD=2.8 weeks post-conception).

Results: After controlling for cohort covariates (including maternal age, birth weight, sex and age post-conception at the time of scan), postnatal total brain volume (Figure 1), total grey matter volume, and total white matter volume were all negatively associated with autistic traits in toddlerhood. This was found in both the dHCP and the CHILD cohort but was not apparent when assessing prenatal brain volume or the linear perinatal growth of these variables in the same infants. Regional analyses in the dHCP cohort showed that postnatal white matter volume in regions of the right temporal lobe was associated with Q-CHAT scores, after controlling for total brain volume, with the direction of effect being positive for the right parahippocampal gyrus and negative for the posterior section of the right medial-inferior temporal gyrus.

Conclusions: Reduced total brain volume in the first two months of life is associated with greater autistic traits, as reported by parents at 18 months of life. Further research is required to understand if this extends to later ages and how it affects the development and connectivity of specific regions, particularly in the temporal lobes.



409.097 Sex Differences in Brain Structure at Birth

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Background:

Males are diagnosed with autism at higher rates than females. One prominent hypothesis suggests that elevated prenatal testosterone levels may contribute to sex-typical brain differences which are more pronounced in autism - potentially explaining its higher prevalence in males. Investigating the neonatal period offers a unique opportunity to explore how perinatal factors, such as prenatal hormone exposure, may shape sex differences in brain development and contribute to the emergence of sex differences in neurodevelopmental outcomes.

Objectives:

To assess sex differences in brain structure at birth to understand whether they show an overlap with brain structure variations associated with autism.

Methods:

We assessed on-average sex differences in global and regional brain volumes in 514 newborns aged 0-28 days (236 birth-assigned females and 278 birth-assigned males) using data from the developing Human Connectome Project. We also assessed sex-by-age interactions to investigate sex differences in early postnatal brain development.

Results:

On average, males had significantly larger intracranial and total brain volumes, even after controlling for birth weight. After controlling for total brain volume, females showed significantly greater total cortical gray matter volumes, while males showed greater total white matter volumes. After controlling for total brain volume in regional comparisons, females had significantly increased white matter volumes in the corpus callosum and increased gray matter volumes in the bilateral parahippocampal gyri (posterior parts), left anterior cingulate gyrus, bilateral parietal lobes, and left caudate nucleus. Males had significantly increased gray matter volumes in the right medial and inferior temporal gyrus (posterior part) and right subthalamic nucleus.

Conclusions:

These findings demonstrate that sex differences in brain structure are already present at birth and overlap with structures implicated in autism. For instance, regions such as the corpus callosum, anterior cingulate cortex, and temporal gyrus show variations in autism and are associated with functions such as social cognition, language development, sensory processing, and inter-hemispheric communication. It is possible that the early-emerging sex differences identified in this research influence neurobiological development from the very beginning of life, potentially explaining the sex differences observed in autism. The early emergence of these differences also supports the hypothesis that prenatal factors play a pivotal role in initiating sex-specific neurodevelopmental trajectories.



409.098 Somatostatin-Expressing Interneuron Number Is Decreased in Prefrontal Cortex in Autism

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Background:

Past research has supported the presence of excitation-inhibition differences in autism that could be a result of differences within cortical circuitry. Somatostatin (SST) is a neuropeptide that is expressed throughout the brain. In the cortex, SST is expressed in a population of GABAergic neurons that encompass all the layers of the cortex. Functions of SST+ cells include modulation of cortical circuits and cognitive function. Reduced number of SST+ cells has been described in several disorders, including Alzheimer's disease and depression.

Objectives:

The number of SST+ cells in autism has not been investigated. Our objective is to quantify the number of SST+ cells in the prefrontal cortex in autism postmortem tissue.

Methods:

To quantify the number of SST+ cells, we cut slices of human prefrontal cortex (BA9, BA46, and BA47) of 10 autism and 10 control cases, and stained the tissue with an antibody against SST. We quantified the number of SST+ cells in 1mm wide area of cortex in all cases.

Results:

We found significant decrease in the number of SST+ cells in both the supragranular and infragranular layers of the cortex.

Conclusions:

Reductions in a specific SST+ cell type called Martinotti cells are likely to be the contributor to the reduced population of SST+ cells in the autism. Martinotti cells have axons that arborize within layer 1 where they promote inhibition through synapsing the apical dendrites of excitatory pyramidal cells. This reduction of SST+ interneurons within the prefrontal cortex may contribute to the excitation-inhibition imbalance in autism. Novel translational paradigms that target SST+ interneurons may prove to be a useful tool for autism treatment.

409.099 Specific Leftward Structural Asymmetry Underlying a Stronger Drive to Systemize Than Empathize in Children with Autism Spectrum Disorder

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Background: Children with autism spectrum disorder (ASD) exhibit a greater empathizing-systemizing difference (D score) compared to typically developing (TD) children, reflecting an extreme male cognitive profile. While sex-related differences in brain asymmetry have been observed, the role of brain asymmetry in driving the empathizing-systemizing difference in ASD remains unclear.

Objectives: This study aimed to explore the association between structural brain asymmetry and D score in children with ASD and TD children.

Methods: We analyzed structural magnetic resonance imaging data from 58 children with ASD and 90 TD children aged 6-12 years. Cortical thickness, surface area, and volume asymmetries were assessed. A support vector regression (SVR) model was employed to predict the D score based on these asymmetries for each group.

Results: Increased rightward asymmetry in the postcentral sulcus correlated with higher D scores in TD children, while increased leftward asymmetry in the posterior ramus of the lateral sulcus (Sylvian fissure, SF) was linked to higher D scores in children with ASD. SVR models demonstrated significant accuracy in predicting D scores for both groups (TD group: $r=0.28$, $P_{\text{perm}} = 0.0067$; ASD group: $r=0.41$, $P_{\text{perm}} = 0.0015$).

Limitations: The smaller number of female participants may affect the generalizability of our findings, as ASD is more commonly diagnosed in males. Additionally, the cross-sectional nature of our study limits our ability to draw causal inferences between systemizing tendencies and lateralized brain structures in children with ASD.

Conclusions: This study identified a specific leftward structural asymmetry in the SF associated with a stronger drive to systemize over empathize in children with ASD. These findings suggest a neurobiological basis for the empathizing-systemizing imbalance in ASD and highlight the importance of brain lateralization in understanding ASD-related cognitive profiles.

409.100 The Relationship between Brain Structure and Autistic Characteristics across Restoration of Weight: A Longitudinal Neuroimaging Study

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Background:

A growing body of research focuses on understanding the co-occurrence as well as the social, emotional and cognitive similarities reported between those with anorexia nervosa (AN) and Autistic individuals. Neuroanatomical studies have identified common regions of interest associated with both states of AN and autistic characteristics (Sader et al., 2022), but restoration of body mass index (BMI) in those with AN is reportedly associated with decreased presentation of autistic characteristics in some individuals with AN (Susanin et al., 2022). Due to a lacking consensus on this relationship, many individuals with acute AN (AAN) do not receive autism assessments due to being classified as "acutely ill", and that autistic characteristics may be secondary to states of starvation (Treasure, 2013; Kerr-Gaffney et al. 2021). This has potential for health services to overlook Autistic individuals with acute AN and contributes to limited understanding concerning which characteristics or phenotypes are associated with AN relative to being Autistic-driven.

Objectives:

This study aims to examine neuroanatomical correlates associated with Autistic characteristics across two time-points, during a current classification of AAN, and post-restoration of weight. This work also aims to establish whether Autistic characteristics and changes in brain structure across weight restoration are able to accurately predict levels of social anhedonia and alexithymia.

Methods:

Brain imaging of Emotion And Cognition of adolescents with Anorexia Nervosa (BEACON) study (Halls et al., 2021), will be used, which includes brain scans of 93 adult individuals across two distinct time-points will be analysed using the FreeSurfer neuroimaging software. A variety of questionnaires will be used to examine sociodemographic features, clinical AN levels, Autistic characteristics, levels of co-occurrence with other psychiatric conditions as well as features of social behaviour. Paired t-tests will be used to evaluate differences in sociodemographic characteristics and brain structure before and after weight restoration. Multiple linear regressions will be used to assess whether global or regional volumes are associated with Autistic characteristics across research time points. Lastly, a random forest regression model will evaluate whether brain volume alongside strength of Autistic characteristics are able to accurately predict levels of alexithymia and social anhedonia.

Results:

Data analysis is ongoing; anticipate that individuals considered weight restored at the second research time point will exhibit reduced levels of anxiety and depression. We also anticipate that structure of the orbitofrontal cortex, anterior cingulate cortex and medial frontal gyrus will be larger post-restoration of weight, but will be associated with Autistic characteristics both pre- and post-weight restoration. Lastly, we anticipate that changes in brain structure alongside presence of Autistic characteristics between research time-points will be able to accurately predict levels of social anhedonia and alexithymia.

Conclusions:

Findings from this research will be discussed and will largely focus on potential clinical applications highlighting the role (or lack thereof) played by malnutrition and weight restoration in how Autistic characteristics are expressed in those with AN. Preliminary findings from previous research in this cohort suggest that Autistic characteristics remain stable across weight stages, highlighting significant benefit towards screening for autism in those presenting with AN.

409.101 Virtual Ontogeny Links Regional Variation in ASD- and ADHD-Associated Cortical Surface Area and Cell-Specific Prenatal Gene Expression

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Background:

Global and regional cortical expansion is driven by biological events taking place during fetal and early post-natal development. Thus, cortical surface area (SA) in childhood provides a snapshot of early neurodevelopmental processes. Regional variations in cortical measures are often observed in children with neurodevelopmental disorders, yet the events contributing to these differences remain unclear.

Objectives:

Here, we applied a single-site data collection inclusive of autism spectrum disorder (ASD), attention deficit hyperactivity disorder (ADHD) and neurotypical (NT) prepubertal children to ask: (1) Are there differences in SA associated with diagnoses of ASD, ADHD, or both (ASD+ADHD)? (2) If yes, does the magnitude of such group differences vary across cortical regions, and (3) What might be their developmental (cellular) origins?

Methods:

948 children (8-12 years) - 65 ASD (without ADHD) (11 girls), 305 ADHD (without ASD) (90 girls), 137 ASD+ADHD (21 girls), 441 NT (141 girls) - completed a T1 MPRAGE on a Philips 3T scanner at a single site. FreeSurfer v6.0 was used to perform cortical reconstruction and extract SA from 11 cortical regions-of-interest (ROIs) for which typical mid-gestation gene expression data is available (PsychENCODE Consortium developmental data; Figure 1A). Linear regressions estimated regional group differences in SA (separately, ASD-versus-NT, ADHD-versus-NT, and ASD+ADHD-versus-NT), adjusting for age, scanner model and head coil. Virtual ontogeny (VO) analyses examined correlations between these three spatial group difference profiles and typical prenatal expression of 8 cell-specific gene panels across the same 11 regions (Figure 1C).

Results:

Linear regressions revealed that children with ASD showed regional profiles of greater SA compared to NT controls, particularly ASD girls versus NT girls. Conversely, children with ADHD showed regional profiles of lower SA compared to NT controls. The ASD+ADHD children showed a mixed group difference profile, with some ROIs exhibiting greater or lower SA relative to controls (Figure 1B).

In ASD, VO implicated proliferative cells (e.g., radial glia, intermediate progenitor cells) and, to a lesser extent, differentiated cells (e.g., excitatory neurons, mural cells). In ADHD, VO implicated differentiated cells (e.g., inhibitory neurons) and proliferative cells (oligodendrocyte progenitor cells, radial glia). In ASD+ADHD, VO implicated proliferative cells (radial glia, intermediate progenitor cells, oligodendrocyte progenitor cells) and differentiated cells (excitatory neurons, endothelial cells, mural cells). See Figure 1D. Notably, analyses in sex-stratified samples implicated similar cell types but sometimes showed reversed patterns of association for girls compared to boys.

Conclusions:

Consistent with prior observations across disparate datasets, we saw distinct patterns of diagnostic differences in regional SA, with ASD>NT while ADHD<NT. Notably, for a combined ASD+ADHD group profile (versus NT), we observed a mixture of increased and decreased regional SA. VO analyses implicate proliferative cells involved in neurogenesis and gliogenesis, as well as some mature cell types. Strikingly, VO suggests differing patterns of association in sex-stratified analyses (e.g., regions with higher radial glia-specific gene expression show lower-magnitude SA differences in boys with ASD but higher-magnitude SA differences in girls with ASD). Considering the smaller number of girls in our sample, further study is warranted to study these possible sex-specific relationships.

**Poster Session****410 - Cognition: Attention, Learning, Memory I**

May 1st, 2025, 5:30 PM - 6:30 PM - Hall 4A

410.102 Utilitarian Processing: A Strengths-Based Approach to Examining Attention and Cognition in Autism

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Background: Consistent with the neurodiversity movement (e.g., Pellicano & den Houting, 2022), we explore potential strengths and unique styles of attending and thinking among autistic youth. We propose that autistic individuals are less influenced by prior experiences that guide their non-autistic peers (Pellicano & Burr, 2012; Van de Cruys et al., 2014) and instead adopt a utilitarian style that is most relevant to the task at hand (Burack & Brodeur, 2020), thus we hypothesize that autistic participants will prioritize this deliberate and task-specific information over prior knowledge, reflecting a distinct utilitarian processing style.

Objectives: We use strength-based approaches to examine unique styles of processing that are utilitarian between autistic and non-autistic youth on one task each of cognition and selective attention.

Methods: Nineteen autistic ($M_{age}=14.71$, $SD=1.77$) and 19 non-autistic participants ($M_{age}=14.42$, $SD=1.69$), matched on age ($p=.607$) and intellectual ability ($IQ_{autistic}=99.74$, $IQ_{non-autistic}=103.42$, $p=.584$) were administered computerized versions of the Cognitive Reflection Test (CRT) and Correlated Flanker task. The CRT involved answering six questions designed to elicit intuitive, but incorrect, responses unless overridden by deliberate processing (Toplak, 2022). Responses were coded as deliberate correct, intuitive but incorrect, or unexpected incorrect. In the Correlated Flanker, the participants identified a central target (car or table) presented in neutral (e.g., table only), congruent (e.g., table flanked by chairs), or incongruent (e.g., table flanked by car keys) conditions. The response times and accuracy rates were measured across five blocks to determine if incongruent flanker pairings would lead to attentional changes overtime. The majority of the trials on middle blocks were incongruent and on the first and last blocks all conditions were presented equally.

Results: On the CRT, no group differences were found in intuitive ($M_{autistic}=2.84$, $SD=1.68$; $M_{non-autistic}=3.37$, $SD=1.95$) and deliberate responses ($M_{autistic}=1.63$, $SD=1.77$; $M_{non-autistic}=2.11$, $SD=2.05$; $ps>.378$). However, the autistic participants provided more unexpected incorrect responses ($M_{autistic}=1.53$, $SD=1.54$; $M_{non-autistic}=0.53$, $SD=0.90$; $p=.019$). In the Correlated Flanker task, both groups responded slightly faster on the first block to the congruent trials ($M_{autistic}=660.09$, $SD=41.43$; $M_{non-autistic}=680.74$, $SD=41.43$) as compared to the incongruent trials ($M_{autistic}=706.09$, $SD=53.75$; $M_{non-autistic}=713.38$, $SD=53.75$), suggesting an initial benefit from the prior learned association. By block four, the autistic participants ($M=500.84$, $SE=44.25$) responded faster than the non-autistic participants ($M=682.29$, $SE=44.25$), but with similar accuracy when identifying neutral stimuli in an incongruent block ($f_{(8, 288)}=2.04$, $p=.042$). On this block, the autistic participants were 8% less accurate in identifying congruent targets than the non-autistic participants ($f_{(8, 288)}=2.04$, $p=.042$), suggesting that they learned the flanker incongruent associations so well it interfered with the congruent association detections. The reaction times and accuracy were similar across both groups on the other blocks.

Conclusions: These findings are preliminary evidence of utilitarian attention among autistic persons. Although both groups effectively disregarded prior associations to learn strongly correlated incongruent pairings in the Correlated Flanker task, the autistic participants were more sensitive to these task conditions. No differences were observed with the CRT, suggesting domain-specific processes.

410.103 A Large Online Study of People with Exceptional Memory: Its Relationship to Systemising

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Background: Exceptional memory is more common in autistic individuals relative to the general population (Treffert, 2009). Autistic traits such as superior attention to detail and stronger systemising, defined as the drive to analyse and construct rule-based systems, have been linked to exceptional memory skills (Baron-Cohen et al., 2009). However, no large-scale studies have investigated if exceptional memory is related to an enhanced drive to systemise. The aim of this study is to understand exceptional memory and its relationship to systemising in both autistic and non-autistic people.

Objectives: (1) To test if people with exceptional memory differ in systemising compared to people with average memory. (2) To test if people with exceptional memory differ in autistic traits compared to people with average memory.

Methods: **Sample:** N= 2,299 volunteers, aged 16 to 60 years old, completed an online Qualtrics survey. **Memory tests:** numeric working memory (digit span), visuospatial memory (spatial span), and visuo-associative memory (paired associates). Memory scores ≥ 3 standard deviations (SD) from the mean were defined as exceptional, while scores within 1 SD of the mean defined the average range. **Questionnaires:** 10-item versions of the Systemising Quotient (SQ), the Autism-Spectrum Quotient (AQ) and the Empathy Quotient (EQ). Memory training was recorded based on self-report. **Analysis:** Data were analysed separately for each task. Binary logistic regression analyses to examine the relationship between the group classification (average vs exceptional) and multiple predictor variables, including SQ-10, EQ-10 and AQ-10 scores. We controlled for age, sex, autism diagnosis, and memory training.

Results: Demographic statistics (Table 1) and group differences in systemising scores (Figure 1). Logistic regression outputs revealed significant coefficients for systemising on the digit span ($\beta = 0.12$, $p < 0.001$) and paired associates ($\beta = 0.16$, $p < 0.001$), but no effect on the spatial span ($\beta = 0.03$, $p = 0.266$). For each extra point on the SQ-10, the odds of being in the exceptional memory group increased by 1.13 times for the digit span and 1.18 times for the paired associates. No significant effects were found for EQ-10, AQ-10 or autism diagnosis across all three tasks. Sex differences were observed only for the spatial span task where the odds of being in the exceptional memory group were 3.4 times higher for males ($\beta = 1.23$, $p < 0.001$). Training effects were significant across all tasks (digit span, $\beta = 2.63$, $p < 0.001$; spatial span, $\beta = 1.46$, $p < 0.001$; paired associates, $\beta = 1.62$, $p < 0.002$). 11% of the exceptional group on the Digit Span task (10/86, Table 1) had a formal diagnosis of autism, compared to its population prevalence of 3% in the general population, and this was significant using a Chi Square test ($p < 0.05$).

Conclusions: This is the first study to demonstrate that people with exceptional memory have a higher systemising drive. People with exceptional memory did not differ in their number of autistic traits, perhaps because the 10-item version AQ cannot tease these apart. Future research should use the 50-item AQ, and examine the brain basis of the relationship between exceptional memory and systemising using MRI.



410.104 Association between Autistic Traits and Atypical Attention Orienting

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Background: Previous research has found that autistic people are quicker to shift attention to external stimuli but slower to disengage attention based on internal goals. Existing research on attention orienting, the ability to change focus within space, has primarily compared people with and without a clinical autism diagnosis. It remains unclear how attention orienting varies with different autistic traits. Autistic traits, which are characteristics associated with autism, can be present in the general population, regardless of a clinical diagnosis. This study investigated whether autistic traits affect attention orienting in the general population.

Objectives: This study aimed to examine 1) whether autistic traits are associated with atypical exogenous (stimulus-driven) and endogenous (goal-driven) orienting in the general population, and 2) whether age, sex, and co-morbid symptoms of anxiety and attention deficit-hyperactivity disorder (ADHD) moderate the association between attention orienting and autistic traits.

Methods: One hundred and twenty adults ($M_{\text{age}} = 22.8$ years, 57% female) completed exogenous and endogenous Posner tasks on a computer. In both tasks, participants responded to a target location that was either validly, invalidly, or neutrally cued by a visual stimulus. Response times and accuracy were recorded. Autistic traits and symptoms of ADHD and anxiety were measured using self-report questionnaires. Based on preliminary analyses of the correlations among different autistic traits, we included the total score of autistic traits and three specific traits—attention to detail, imagination, and attention switching—in the data analyses.

Results: Exogenous orienting was not associated with different autistic traits, except for the attention to detail trait. Participants with a tendency to focus on details were quicker to disengage their attention in the exogenous orienting task. ADHD symptoms were found to be a significant moderator. When ADHD symptoms were low, participants with higher autistic traits were slower in the invalid cue condition. This association not found at average or high levels of ADHD symptoms. No significant moderating effects of anxiety symptoms, age, and sex were found. In the endogenous task, participants with higher autistic traits were slower at shifting attention. Anxiety symptoms were found to be a significant moderator. When anxiety symptoms were low, participants with a stronger imagination tendency were slower to shift their attention, which was not found at average or high levels of anxiety. Conversely, when anxiety was high, participants who tended to focus on details were quicker to disengage attention, which was not found at low or average levels of anxiety. No significant moderating effects of ADHD symptoms, age, and sex were found.

Conclusions: This study highlights that features of atypical attention orienting in autistic individuals are not generalisable to the general population with autistic traits. While the overall severity of autistic traits does not affect exogenous orienting, it slows the endogenous shift of attention. Our results also support the importance to consider effects of comorbid symptoms in autism-related research. Together, these findings improve our understanding of how autistic traits relate to attention orienting, warranting further research into the neural mechanisms and strategies to support attention functions in people with high autistic traits.

410.105 Association between Gut Microbes and Traditional Chinese Medicine Syndrome Types in Children's Cognitive Performance with Autism Spectrum Disorder

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Background: Early diagnostic and early intervention of children with autism spectrum disorder (ASD) can present challenges due to various factors including heterogeneous symptoms, the absence of a conclusive genetic or medical test or objective assessment. Actionable and modifiable factors exist in the gut brain axis of ASD children. There is abundant Chinese literature about the application of food therapy for alleviating gastrointestinal symptoms and neurodevelopmental disorders. Functional capabilities of ASD vary with intellectual ability. In general, co-occurrence of intellectual disability in ASD is a predictor of less favorable prognosis.

Objectives: we aimed to investigate the eating behavior and gut microbiota profile in a cohort of children with ASD and to correlate TCM syndrome-differentiation with their cognitive developmental profiles.

Methods: ASD diagnostic assessment was performed by a well-experienced psychiatrist. All participants' eating habits also investigated by using Children's Eating Behavior Questionnaire (CEBQ). Three TCM syndrome (zhengs) types : Kidney Jing Deficiency, Liver Qi Stagnation, Deficiency of both the Heart and Spleen have been used for ASD children classification. A total of 28 ASD children were classified to three TCM syndromes based on their clinical manifestation by two experienced TCM attending physicians independently. Fecal microbiota analyzed by 16S rRNA NGS sequencing.

Results: Kidney Jing Deficiency group showed higher level of picky eating behavior than other two syndrome groups. Cognitive performance (Developmental Quotient) of the Kidney Jing Deficiency group was particularly low when compared with Deficiency of Both the Heart and Spleen and Liver Qi Stagnation. The gut microbiota richness of healthy children was not significantly different from that of autistic children with high intellectual ability, but was significantly different from that of ASD children with low intellectual ability. ($P=0.034$). Comparison of the richness of gut microbiota in the three TCM syndromes showed no significant difference, but the trend of lower alpha-diversity in children with Kidney Jing Deficiency is noted.

Conclusions: In our study, poor microbiota richness is more prevalent in those autistic children with lower cognitive performance. Classifications of ASD children further with TCM syndromes bring an alternative therapeutic strategy using syndrome related formula to increase their diet variability and thus lead to microbiota positive modulation and influence the gut brain axis to promote more positive behaviors and less parenting difficulties.



410.106 Beyond the Here and Now: Theory of Mind, Episodic Memory, Episodic Future Thinking

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Background: Mentalising is the ability to understand and represent alternative mental states, which is crucial for inferring the feelings, thoughts, intentions, beliefs, and desires of others. It also plays a role in predicting possible behavioural reactions to various situations, as well as in self-referential cognition, including episodic memory and episodic future thinking. However, only two studies have directly explored these areas in individuals with autism, and the relationship between these abilities remains unclear.

Objectives: This study aims to investigate the interaction between episodic future thinking, episodic memory, and mentalising in autistic and non-autistic groups. It does so by differentiating between psychological and physical representations of past and future experiences through well-controlled tasks that vary only in the type of representation required.

Methods: This study used a between/within-group design. It involved 40 autistic individuals aged 18-60 and 41 non-autistic adults in a control group, matched for age and IQ. Participants engaged in an adapted self-reference effect (SRE) task, where they made judgments about themselves across three temporal frames: past, present, and future. In addition, they completed a "strange stories" film task and a monetary temporal discounting task. These tasks were designed to assess both psychological and physical self-referential processing.

Results: The analysis is ongoing, but preliminary findings indicate significant differences in response times and accuracy scores between the physical and psychological domains. Although no group differences were found in the SRE task, the two groups exhibited differences in mentalising abilities. Furthermore, results from the monetary temporal discounting task revealed that the autism group had higher indifference scores and lower k-values, suggesting that they may be more patient regarding delay discounting—a finding that contradicts existing literature.

Conclusions: These results imply that autism may involve distinct differences in how the present physical self is represented in self-referential encoding. This finding is discussed in relation to recent advancements in cognitivist theories of autism, particularly the notion that challenges in episodic memory, future thinking, and psychological processing may reflect differences in the general capacity for self-projection.

410.107 Cognition and Executive Function in Aging Autistic Adults

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Background:

Despite growing research on autism, little is known about aging in this population. Neurotypical aging is often associated with declines in cognitive and executive function, but how these processes unfold in autistic adults remains unclear. This study aims to compare the cognitive and executive function performance of aging autistic adults with neurotypical individuals, providing insights to support the development of systems and interventions tailored to aging autistic individuals.

Objectives:

1. To investigate how executive function ((working memory, inhibitory control, and cognitive flexibility)) domains change across age across groups.

Methods:

The cohort is in progress but at the time of this analysis, it includes 80 autistic (mean age 50 +/- 10) and 64 neurotypical (mean age 58.5 +/- 12.5) aging adults. Cognitive and executive function assessments included three subtests of the Cambridge Neuropsychological Test Automated Battery (CANTAB), and the Behavior Rating Inventory of Executive Function – Adult (BRIEF-A). Group differences were overall assessed using general linear regression models.

Results:

Considering three outcome measures from the CANTAB battery—OTSPSFC (Problems Solved on First Choice), MTTTIC (Total Incorrect Trials), and SSTSSRT (Stop-Signal Reaction Time)—used to assess executive functions, adjusting for FSIQ reveals that age-related changes in performance do not significantly differ between the ASD and Control groups. Exploring the BRIEF-A assessment in those with FSIQ over 80, both the ASD and Control groups show changes with age but the age trajectories are different in the Plan/Organize (Estimate = 2.199, $p = 0.047$) and Task Monitor (Estimate = 2.578, $p = 0.033$) domains. However, other domains i.e. Inhibit, Shift, Emotional Control, and Working Memory) do not exhibit significant differences between groups with age. ($p = 0.858$, $p = 0.383$, $p = 0.834$, $p = 0.284$, respectively).

Conclusions:

In this preliminary analysis, we found some evidence for differential aging profiles in executive function. The full analysis will be presented at the meeting.

410.108 Concurrent Learning of Linguistic Adjacent and Nonadjacent Dependencies in Autistic Adults

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Background:

Language comprises both adjacent and distant structures, leading to frequent co-occurrence of adjacent dependencies (AD) and non-adjacent dependencies (NAD). For example, in "He is sleeping," the words "He" and "is" form an AD, while "is" and the "-ing" in "sleeping" form a NAD. Previous studies on statistical learning in autistic individuals have examined AD and NAD separately, primarily using non-linguistic visual patterns as input (Obeid et al., 2016). However, since statistical learning may operate through domain-specific mechanisms (Conway & Christiansen, 2005), it is possible that learning AD and NAD in a linguistic context presents particular challenges for autistic individuals.

Objectives:

The present study investigated the abilities of autistic adults to concurrently learn AD and NAD concurrently in the linguistic domain.

Methods:

Fifteen autistic adults (aged 21-39) and 15 age-matched neurotypical (NT) controls (aged 19-37) participated in the study. The study consisted of two phases: an exposure phase and a learning outcome test phase. During the exposure phase, participants were presented with eight-element linguistic sequences, where two elements formed AD and the other two elements formed NAD (Figure 1). Eye-movements were recorded.

Learning was inferred if participants showed shorter response time (RT) or gaze latencies for AD or NAD elements compared to four unrelated elements. In the outcome test phase, participants judged the familiarity of the sequences that either conformed to or violated AD or NAD patterns.

Results:

During the exposure phase, both groups demonstrated decreased RTs for AD and NAD elements compared to unrelated elements ($p < 0.001$), with no significant difference in the magnitude of RT decreases between AD and NAD elements ($p = 0.170$). Gaze latency results mirrored the RT findings. In the outcome test phase, the NT group exhibited above-chance accuracy in judging the familiarity of both AD and NAD sequences, indicating explicit awareness of these patterns. In contrast, the autistic group performed at a chance-level when judging either AD or NAD sequences.

Conclusions:

Autistic adults, like their NT counterparts, were able to track the statistical regularities of linguistic input and form both AD and NAD associations. However, unlike the NT group, autistic adults did not show explicit recognition of the learned AD and NAD patterns, suggesting that the memory storage or retrieval of newly learned linguistic patterns may be weaker in autistic individuals.



410.109 Creating a Dataset of Autistic and Non-Autistic Individuals' Experiences of Everyday Events

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Background:

Everyday life is composed of patterns of activities and behaviours, called events, such as *brushing your teeth* and *going grocery shopping*. People perceive and gain knowledge of events by experiencing them personally or vicariously, and each person's interpretation of their experience of an event may be unique. In particular, autistic individuals have social communication differences, repetitive behaviours and restricted interests, and sensory sensitivities that may result in different experiences of events, both between autistic individuals and compared to non-autistic individuals.

Objectives:

- (1) Conduct a quantitative assessment of autistic individuals' experiences of events.
- (2) Provide an open-access dataset for future studies.

Methods:

We compiled a set of normed ratings of event experience-related dimensions, such as familiarity, social interaction, valence, predictability, and duration. Data was collected for 384 events from 152 autistic and 150 non-autistic adults aged 18-30 (approx. 50 participants per event).

Participants rated events on 14 dimensions and completed questionnaires assessing autism-related traits. Correlations between dimensions were calculated within autistic and non-autistic groups separately. Dimension ratings, and correlations between dimensions, were compared between groups.

Results:

Overall, autistic and non-autistic individuals rated events differently on 10 dimensions (Figure 1). For instance, autistic individuals rated events higher on sensory stimulation and arousal, suggesting they may experience events differently than non-autistic individuals due to sensory sensitivities. Autistic individuals also rated events lower on control and predictability, which may be related to restricted, repetitive behaviour patterns. Autistic and non-autistic individuals did not differ in their familiarity of events or how much they experienced events previously.

Differences in correlational patterns (Figure 2) also suggest that autistic and non-autistic individuals experience the interplay of event dimensions differently. The largest differences were seen in the relationships with the dimensions of social interaction, sensory stimulation, and arousal. For example, there was a larger, positive correlation between arousal and valence for non-autistic individuals, suggesting that non-autistic individuals more strongly associate arousing events with being pleasant than autistic individuals. Additionally, sensory stimulation was negatively correlated with desire to participate for autistic individuals, whereas this correlation was positive for non-autistic individuals. This suggests that these groups' desire to be take part in different events is related to the sensory experiences involved in the event.

Conclusions:

Overall, the results are in line with our existing knowledge of autism, and contribute to our understanding of autistic (and non-autistic) individuals' everyday life experiences. Notably, events are likely experienced differently by autistic and non-autistic individuals due to the sensory stimulation and arousal involved. Events being more stimulating or arousing likely affects an autistic person's perception and understanding of events, which could have broader implications for life outcomes and social communication.

Our study will offer the largest open access dataset available of autistic and non-autistic individuals' experience of events. These data also provide a resource for researchers using event-based stimuli in future studies.

Further analyses are planned to investigate differences in dimension ratings between genders and between social and non-social events. We additionally aim to explore how levels of autistic traits relate to dimension ratings.



410.110 Differences in Academic Achievement and Association with Executive Function in Siblings at High and Low Likelihood for Autism

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Background: Academic achievement is associated with later educational attainment, employment, and mental and physical health. Nearly two-thirds of autistic children show below average or lower than expected achievement in at least one academic area, which may increase the odds of later educational or employment challenges. Relatively little is known about academic achievement in high-likelihood (HL) siblings, who are at increased likelihood for autism and other developmental and clinical concerns. Executive functioning (EF) contributes to academic achievement in the neurotypical population. However, despite the high prevalence and early onset of EF problems in autistic and HL children, the relations between EF and academic achievement are not yet understood in this population.

Objectives: 1) Characterize academic achievement in HL siblings with and without autism at school-age, 2) determine if EF and academic achievement are associated, and 3) evaluate whether this association differs based on autism diagnosis and familial likelihood for autism.

Methods: Participants were 251 high-likelihood (HL; HL-ASD=72, HL-noASD=179) and 108 low-likelihood (LL) children from the Infant Brain Imaging Study. EF was directly assessed at age 24 months using the A-not-B and at ages 6-14 years (school-age) using parental ratings on the Brief Inventory of Executive Functioning, Second Edition (Global Executive Composite, GEC) and directly using the NIH Toolbox Flanker Inhibitory Control and Attention Test (inhibition) and Dimensional Change Card Sort (cognitive flexibility). Math and reading achievement were directly assessed using the Wechsler Individual Achievement Test, Third Edition. Covariates were intelligence (General Conceptual Ability, GCA; Differential Abilities Scales, Second Edition), maternal education, and gender.

Results: The HL-ASD group had significantly lower scores than the LL group on all math and reading indices and subtests, and lower scores than the HL-noASD group on all the math but not the reading indices and subtests ($p < .05$). The HL-noASD group had significantly lower scores than the LL group on the Math Problem Solving and Word Reading subtests ($p < .05$). Better EF at age 24-months was associated with better math (Math Problem Solving; Table 1) but not reading achievement at school-age across all groups (group x EF interaction; ns). Parent-reported executive functioning problems at school-age were associated with lower math (Numerical Operations) but not reading achievement across all groups (group x EF interaction, ns; Table 2). The HL-ASD group demonstrated greater increases in math and reading achievement compared to the LL group as cognitive flexibility increased (DCCS) but this effect did not survive correction for multiple comparisons ($p = .031$; $p = .031$, respectively). Inhibitory control (Flanker) at school-age was not associated with math or reading achievement (main effects and group x EF interactions; ns).

Conclusions: Early emerging executive functioning problems are related to later math achievement in school age children (HL-ASD, HL-noASD, and LL). Math achievement followed an endophenotypic pattern (HL-ASD < HL-noASD < LL), implying an association of math achievement with heritable factors contributing to autism. Findings have the potential to inform early intervention to improve EF and suggest that targeting cognitive flexibility for children on the autism spectrum could improve academic achievement.

**410.111** Revisiting Bouba and Kiki in Autism

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Background: Beginning in early childhood, neurotypical (NT) individuals across cultures and languages associate “round” pseudowords like *bouba* or *maluma* with globular shapes, and non-rounded pseudowords like *kiki* or *takete* with angular shapes (Cwiek et al., 2022; Fort et al., 2018; Kohler, 1929). However, the tendency to make systematic connections across auditory and visual modalities in the *Bouba-Kiki* task may not extend to autism (Gold & Segal, 2017; Krol & Ferenc, 2020; Oberman & Ramachandran, 2008; Occelli et al., 2013). Because the *Bouba-Kiki* task is thought to tap integration across auditory and visual sensory domains, we probed the role of language and sensory processing in autistic individuals’ performance in addition to replicating these previous studies.

Objectives: We investigated whether autistic and NT individuals endorsed expected auditory-visual correspondences (i.e., demonstrate the *Bouba-Kiki* effect) to a similar extent. We also tested relationships between task performance and sensory processing, language, nonverbal cognition, and intensity of autism traits.

Methods: Participants. Participants (recruited as part of a larger study) completed the Autism Diagnostic Observation Scale – 2nd Edition (ADOS-2; Lord et al., 2012); the autism group met stringent DSM-5 diagnostic criteria. The sample included 27 autistic and 33 NT participants. The groups did not differ in age or nonverbal cognitive ability; see Table 1.

Procedure. Participants completed an online two-alternative forced-choice *Bouba-Kiki* task comprised of eight spoken pseudowords with English phonotactics. Four of the words contained “round” phonemes (e.g., /m/, /b/) and four contained “angular” phonemes (e.g., /t/, /k/). On each trial, participants were asked “Which one is ____” while viewing side-by-side images of round and angular shapes. Trial order was randomized across participants. They also completed the Penn Matrix Reasoning Test (PMAT; nonverbal cognition), Penn Verbal Reasoning Test (PVRT; Gur et al., 2010; language ability), and the Sensory Reactivity in Autism Spectrum questionnaire (SR-AS; Elwin et al., 2016). The subscales of the SR-AS (hyper-reactivity, hypo-reactivity, sensory motor, and sensory interest) measured sensory processing and ADOS-2 CSS scores measured intensity of autism traits.

Results: Logistic mixed-effects models revealed no significant group differences ($p=.064$). However, the NT group demonstrated the *Bouba-Kiki* effect at a level significantly above chance, $\beta=0.84$, $SE=0.35$, $z=2.42$, $p=.016$; the autistic group did not, $p=.570$; see Figure 1. Within the autistic group, Kendall’s tau correlations indicated that *Bouba-Kiki* effect strength was associated with sensory-motor differences ($r=-0.33$, $p=.032$), though significance was not retained following Holm-Bonferroni corrections. Correlations with language and cognitive ability, intensity of autism traits, hyper-reactivity, hypo-reactivity, and sensory interest were non-significant ($ps>.05$).

Conclusions: These findings contribute to a growing body of evidence suggesting the *Bouba-Kiki* effect may be less robust in autism. However, individual variation was evident, which may be related to sensory-motor processing. This potential link between autistic individuals’ sensory-motor processing and audiovisual correspondences probed by the *Bouba-Kiki* task may speak to difficulties integrating stimuli across sensory modalities and could be consistent with findings of reduced embodiment experiences in autism.



410.112 Emotional Dysregulation As a Mediator of Task-Based and Day-to-Day Executive Functioning in Adolescents

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Background: Autistic people face emotion dysregulation (ED) and executive functioning (EF) challenges at a higher rate than their peers (McDonald et al., 2024; Kenworthy et al., 2009). EF refers to cognitive skills that enable one to cater their behavior to a goal (Udhmani, 2020). Differences in autistic individuals are found in EF tasks measuring inhibition, generativity, and flexibility (Brady et al., 2015). However, there is a distinct gap between performances on task-based measures of EF and measures of everyday EF skills, both impacted by ED (Conner et al., 2023; Kenworthy et al., 2009). ED is defined by one’s inability to modify their emotional state (e.g., emotional dysphoria) and manage behaviors accordingly (e.g., emotional reactivity) in response to environmental triggers (Aldao et al., 2016; Mazefsky et al., 2014). Prior literature suggests that lower EF performance on task-based measures is associated with elevated ED in autism. However, further work is needed to elucidate ED’s role between task-based and everyday EF (Cotescu et al., 2023; Cibralic et al., 2019).

Objectives: 1) Examine the relationships between task-based and day-to-day EF, and 2) assess whether facets of ED (e.g., dysphoria [ED-D] and reactivity [ED-R]) mediate this relationship in neurodiverse youth.

Methods: Sixty-two youth ($M_{age} = 13$, $SD_{age} = 2.90$; 53% male; 38 autistic; 59.7% white, 6.5% black, 14.5% Asian/South Asian/MENA, 11.3% Multiracial) completed the Delis-Kaplan Executive Functioning System (D-KEFS, Delis et al., 2001) to assess task-based EF (see Table 1 for DKEFS variables used). Caregivers completed measures of everyday EF (BRIEF-2 Behavior Regulation Index [BRI] and Cognitive Regulation Index [CRI]; Gioia et al., 2000; Flexibility Scale [FS], Strang, 2017) and ED-D, ED-R (Emotion Regulation Index, Mazefsky et al., 2018).

Results: Bivariate correlations suggest some associations between task EF and everyday EF skills (Table 1). Path models assessing ED-D and ED-R as independent mediators suggested slower (processing) relates to more ED-R ($b=-.32$, $p<.01$), while worse ED-R positively relates to BRI, CRI, and FS difficulties (all $b>.32$, $p<.01$). Slower VF (verbal inhibition/generativity) relates to more ED-D ($b=-.29$, $p<.01$) while ED-D positively predicted BRI, CRI, and FS challenges (all $b>.36$, $p<.01$). ED-R was a significant mediator between DF-FD and BRI ($CI[-.25, -.03]$), DF-FD and FS ($CI[-.02, -.02]$, Figure 1). No other mediations were significant.

Conclusions: Results suggest inconsistent associations between task and everyday EF, and that ED has broad implications on EF. Specifically, the presence of indirect effects of ED especially when there are no direct effects between task-based EF and everyday EF underscores the importance of considering ED when examining how task-based EF abilities translate into real-world everyday EF behaviors. Furthermore, it is likely that task-based and everyday EF are related through multiple mediators (that can cancel out and obscure the zero-order relationships), and future research should address possible additional mediators (e.g., comorbid ADHD or internalizing symptoms; Hollocks et al., 2014; Demetriou et al., 2019). Due to the likelihood of less favorable outcomes for individuals with poor EF and ED skills, future research should target intervention methods strengthening both areas.



410.113 Examining Neurophysiological Markers of Increased Perceptual Capacity in Autistic and Non-Autistic Adults

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Background: Over more than a decade, studies have shown that the amount of sensory information processed at any one time (perceptual capacity) is greater for autistic people compared to non-autistic people. Evidence from quantitative behavioural studies (Remington et al., 2009; 2012) and qualitative studies indicate a perceptual advantage for autistic people (Irvine et al., 2023). This increase in capacity may be linked to both positive (superior perception skills) and negative (increased distractibility) aspects of the autistic experience. It remains unknown, however, what underlying neurological mechanism is driving this difference.

Objectives: In this study, we used electrophysiological indices of attention allocation (P3b) as a marker of perceptual capacity in a visual search task. Finding the driver of this increased capacity is vital to capitalise on the additional capacity while supporting associated challenges.

Methods: We tested 73 participants aged between 18-40 (Autism Group: $n=31$; non-autistic group $n=42$) who were matched in age ($p=.34$) and FSIQ-2 ($p=.16$; Autism group: $M_{age}=25.18$, $SD=5.2$; $M_{IQ}=114.63$ $SD=9.4$; Non-autistic group: $M_{age}=25.46$, $SD: 4.5$; $M_{IQ}=110.97$ $SD=12$).

Participants completed a visual search task in which they identified whether a target shape was present or absent, with varying numbers of distractors on the screen while concomitant EEG activation was recorded. We averaged data over the P0z electrode over the 330-370ms interval and entered the data into a mixed analysis of variance.

Results: Preliminary analyses suggest a three-way interaction between group (autistic and non-autistic participant) search condition (target absent vs present) and set size (1, 2, 4 and 6), indicating evidence for an increased perceptual capacity in the autism group ($F(1,71)=5.6$, $p=.02$). While post-hoc tests did not survive correction, visual inspection shows a markedly greater P3b amplitude in the target-present condition at set size 6 for the autistic group compared to non-autistic participants.

Conclusions: These findings provide initial evidence for EEG biomarkers of perceptual capacity differences between autistic and non-autistic adults. Further, an increased P3b amplitude in the autistic group during target-present trials at larger set sizes supports the hypothesis that the P3b component reflects increased perceptual experience. Whilst less attentional resources were used during the target-absent condition. Demonstrating the presence of a neurological marker for perceptual capacity differences in autistic people may offer the potential for a) further understanding of cognitive mechanisms underpinning the difference and b) the development of accessible implicit tasks of perceptual capacity that could be used with less able individuals (e.g. young children, those with intellectual impairments).

410.114 Examining the Longitudinal Relation between Early Executive Function and Later School Readiness in a Sample of Autistic Preschool Children

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Background: Previous literature suggests a link between executive function (EF) and school readiness, especially in math learning. However, research regarding the relation between EF and school readiness in the autistic population is limited. A cross-sectional study with 3- to 5-year-old participants found that autistic children score significantly lower on school readiness and EF measures compared to non-autistic peers matched on age and IQ (Pellicano et al., 2017). This study suggests EF skills are associated with school readiness in autistic children. Furthermore, a longitudinal study with autistic school-age children reports EF at age 6 predicted better math learning at age 9 (St. John et al., 2018).

Objectives: We examine whether EF longitudinally predicts school readiness beyond Nonverbal IQ (NVIQ) in autistic preschoolers.

Methods: From an ongoing longitudinal study investigating the development of EF in autistic and non-autistic 2- to 5-year-olds ($n=272$, 149 autistics, 73% male), 55 participants have returned for their two-year follow-up visits to date, including 43 autistic (77% male) and 12 non-autistic children (42% male). We administered ADOS and ADI-R to determine the diagnostic group at baseline. We administered Mullen Scales of Early Learning as a measure of cognitive functioning. Additionally, children completed behavioral tasks (e.g., Tricky Box, Hide and Seek, A-not-B, and Flip Book) that evaluate several EF domains, including Inhibition, Delay, Shifting, and Working Memory. We administered DAS Early Year School Readiness Early Number Concepts, Matching Letter Like Forms, and Phonological Processing Forms subtests to measure school readiness in the two-year follow-up visit (4 to 7 years old). A single EF factor score was created for each child with confirmatory factor analysis using maximum likelihood estimation with robust standard errors. With a mean of 0 and a standard deviation of 1, these scores are standardized and can be interpreted as z-scores. We then used Spearman's and Pearson's correlations to examine the relation between age, Mullen Nonverbal Developmental Quotient (NVIQ), EF factor score, and school readiness subtests t-scores and composite standard score. Finally, we fit four sequence multivariable linear regressions to examine whether EF factor scores predict school readiness scores, controlling for NVIQ.

Results: Controlling for initial NVIQ at baseline, EF scores at baseline predicted Early Number Concepts scores two years later ($F_{change}=5.67$, $p<.021$), Phonological Processing Forms scores ($F_{change}=5.11$, $p<.035$), and overall School Readiness composite scores ($F_{change}=6.24$, $p<.021$). In the autistic group, we observed positive correlations between NVIQ, EF, Early Number Concepts, and Matching Letter Like Forms scores. Initial EF scores predicted later Early Number Concepts scores beyond initial NVIQ ($F_{change}=4.25$, $p<.046$).

Conclusions: Our findings replicate earlier studies showing that EF is strongly associated with math school readiness beyond cognitive ability. Our study extends that work by exhibiting a longitudinal relation between EF and math school readiness in autistic preschoolers. These findings have important implications for research and practice in understanding and improving the standard of assessment and intervention to close the school readiness gap between autistic and non-autistic children.

410.115 Exploring Cognitive Flexibility in Children with ASD: The Role of Visual Cues and Task Conditions

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Background: Cognitive flexibility (CF) is the ability to efficiently switch between tasks or demands in changing contexts. Children with autism spectrum disorder (ASD) often struggle with CF. However, results from common CF tasks, such as Dimensional Change Card Sort (DCCS) and Wisconsin Card Sort Test (WCST), have been inconsistent, particularly regarding perseverative errors—repeated responses despite task demands change. These inconsistencies complicate the design of interventions for children with ASD. Factors such as explicitness of task instructions and cognitive demands, like working memory, may explain these discrepancies. Working memory helps individuals hold and manipulate information during switching (i.e., CF). Clarifying how different contexts and working memory demands impact perseveration could provide a deeper understanding CF in children with ASD and how it differs from that of typically developing (TD) children.

Objectives: The study aimed to examine how different assessment contexts influence perseveration in children with ASD compared to TD peers.

Methods: Twenty children with ASD and TD (10 per group, 8.91 years old $\pm$ 1.48), matched by age and gender were recruited. Each child completed two card-sorting tasks: an explicit condition with clear sorting rules (computerized DCCS), and an implicit condition requiring rule discovery based on feedback (computerized WCST). They also completed the Wechsler Intelligence Scale for Children, Fifth Edition (WISC-V). T-tests were used to analyze group performance differences across conditions. A linear regression model was conducted to determine the contribution of Digit Span and Picture Span of the WISC-V to perseverative errors in the computerized WCST, controlling for potential confounding variables (e.g., full-scale IQ).

Results: Table 1 shows group performance differences. No significant difference was found between children with ASD ($M = 3.95$, $SD = 1.81$) and TD ($M = 3.37$, $SD = 2.01$) in the explicit computerized DCCS ($t = -0.934$, $p = 0.356$). However, children with ASD ($M = 27.33$, $SD = 12.86$) made significantly more perseverative errors than TD ($M = 16.58$, $SD = 8.04$) in the implicit computerized WCST ($t = -3.031$, $p = 0.005$). Regression analysis showed that Picture Span, but not Digit Span, predicted perseverative errors in the computerized WCST, controlling for group and full-scale IQ (Table 2).

Conclusions: Children with ASD performed similarly to their TD peers in explicit and well-structured task. However, in less explicit, more complex tasks, children with ASD showed more perseverative errors, possibly due to increased working memory demands. These findings highlight the importance of considering task contexts and cognitive load when assessing CF in children with ASD. Moreover, this results also support that compared to auditory system, visual sensory system of individuals with ASD seems to be similar to TD peers. This advantage may explain why children with ASD performed similarly to their TD peers in explicit tasks—not necessarily because their CF is intact, but because the explicit visual cues provided in these tasks help compensate their CF deficits. Further research with a larger sample size is warranted to validate these findings and explore the role of visual information in supporting CF in children with ASD.



410.116 Exploring Gaze Patterns for Autism Diagnosis with Lstm and Attention Mechanisms

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Background: Eye-tracking objectively measures overt attention by quantifying the direction of the eye over time. This technology is a valuable tool for studying visual attention in autism spectrum disorders (ASD), revealing atypical attention biases, such as reduced fixation on social stimuli. Previous studies have shown that incorporating dynamic stimuli in eye-tracking tasks can improve engagement and reveal more profound insights into social cognitive processes in ASD.

Objectives: This study investigates how spatiotemporal patterns in eye gaze can be used to discriminate among typically developing (TD) children, children with ASD with higher-IQs, and children with ASD with lower-IQs. Bidirectional-Long-Short-Term-Memory (LSTM) recurrent neural networks are used to classify and describe gaze patterns reflective of social and cognitive differences in ASD. We focus on building models that capture meaningful temporal sequences in eye-tracking data.

Methods: This study comprised 86 participants ($n=54$ ASD; $n=32$ TD, 6-month to 17-year). Participants were stratified into four age cohorts (0–1, 2–4, 5–9, 10–17 years) and classified by gender. Eye-tracking data were acquired using a set of video clips reflecting following tasks: Activity-Monitoring (AM), Dyadic-Bid-Sensitivity (DB), Social-Referencing (SR), and Theory of Mind (ToM). The eye-tracking data, recorded as spatiotemporal sequences of gaze coordinates (x, y) over time, were input to a LSTM network. The LSTM's architecture consisted of two bidirectional LSTM layers, each comprising 128 hidden units, followed by fully connected dense layers. To enhance the model's interpretability, an attention mechanism was integrated to dynamically weigh time steps of particular importance, particularly those corresponding to moments of social interaction. The model was trained using the Adam gradient-descent optimizer, and early stopping used to decrease overfitting. Since the data was imbalanced across TD, higher-IQ autism, and lower-IQ autism, the SMOTE was used to balance the classes in training. The LSTM's generalization accuracy was assessed by k-fold cross-validation to ensure the model's performance was not reliant on just one subset of the data. **Results:** LSTM classified TD, high-IQ, and low-IQ autism with $\text{acc}=91.4\%$. It excelled social engagement tasks (DB and ToM $\text{acc}=95\%$) owing to identifying the link between spatiotemporal patterns to social engagement. AM accuracy was 78%. Confusion matrix analysis revealed most successful differentiation between high-IQ autism and TD (F1 scores: 0.92, 0.90). LSTM's attention weights emphasized fixations during key social interactions, highlighting attentional differences in ASD, especially in DB and ToM. Performance remained robust across age groups and genders. Stratifying by age did-not cause any major deterioration in performance, with the 2–4, 5–9, 10–17 year age groups having accuracy scores of 85.2%, 87.8%, and 90.8%, respectively. Gender differences were minimal (male: 92.0%, female: 90.7%).

Conclusions: This study demonstrates the power of combining eye-tracking with deep-learning models like Bidirectional-LSTM to identify meaningful gaze patterns in ASD. The model not only achieved high classification accuracy but also offered interpretable insights into cognitive and behavioral processes in ASD. The attention mechanism provided valuable focus on critical moments of social interaction, highlighting the role of explainable AI in neurodevelopmental research.

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410.117 Exploring Visual Statistical Learning in PRE-School Verbal and Minimally Verbal Autistic Children : An Electrophysiological Study

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Background:

Implicit statistical learning (ISL) refers to the domain-general ability to learn statistical regularities through mere exposure and without the intention to learn. ISL is potentially relevant to language development, particularly in speech segmentation, which relies on sensitivity to transitional probabilities between speech sounds. Research has seen a growing interest in tracking individual performance in SL task, mainly as a predictor of linguistic abilities. This issue is therefore of particular importance in the field of autism because approximately 30% of people with autism spectrum disorder (ASD) will not develop language during their development, for reasons that are not yet elucidated. Indeed, individuals with ASD have diagnostic impairments in domains, such as language, that are associated with ISL. The identification of word boundaries in continuous speech is a critical first step in language acquisition that can be accomplished via statistical learning and reliance on speech cues. However, it is unclear whether individuals with ASD have specific ISL deficits. Here, we use EEG during statistical learning to explore these questions.

Objectives:

This study investigates the relationship between ISL and language abilities in typically developing children and children with ASD. In the long term, children's performance on the ISL task will be used as a predictor of their language abilities.

Methods:

In this study, we investigated the electrophysiological correlates of visual statistical learning in young verbal and minimally children with ASD using an event-related potential sequence learning paradigm. The experimental paradigm is a modified version of the task developed by Jeste et al. (2015) in which children look at a sequence of centrally presented little monsters, made up of the random presentation of three pairs of items. After an exposure phase, the predicted little monster was replaced by another one in 10% of the trials (oddball condition). A sample of 54 verbal autistic children and 10 minimally verbal autistic children, for a total of 64 children with ASD (mean age: 56.40 months) and 45 typically developing peers (mean age: 53.98 months) took part in the experiment.

Results:

Compared to typically developing (TD) controls, the ASD groups as a whole showed reduced evidence of learning as defined by P300 (attention to novelty) component. Examining the groups of children with ASD, we find no difference in the P300 component between verbal children with ASD and minimally verbal children with ASD.

Conclusions:

Through this work we have demonstrated a global reduced learning in SL in ASD. Further research is needed in order to test whether this deficit at 56 months of age corresponds to a delay or a genuine impairment in learning. Crucially, our results show that electroencephalography can be used to measure ISL in preschool verbal and minimally verbal children with ASD. In the longer term, we hypothesize that children who perform well in the statistical learning task are those who are most likely to access language in the course of their development. This task therefore is suitable for future studies to investigate ISL during development or in clinical populations.



410.118 Flow and Similar Attentional States in Autism and ADHD: A Scoping Review of Similarities and Differences

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Background: Flow is a state of deep immersion and engagement achieved when challenge and skill are balanced. While research has largely focused on flow in neurotypicals (NTs), emerging evidence suggests that in autism and attention-deficit/hyperactivity disorder (ADHD), the experience of flow may be distinct from traditional definitions, including the constructs of hyperfocus (intense concentration on a task), autistic inertia (difficulty initiating or shifting tasks), and monotropism (narrow attentional focus on specific areas). Understanding these distinctions could support neurodivergent individuals in managing focus, reducing task-related stress, and optimizing productivity. A scoping review aimed at addressing this research gap provides a comprehensive overview of existing evidence and identifies key concepts related to flow and similar states in neurodivergent populations.

Objectives: This scoping review examines flow, autistic flow (including autistic inertia and monotropism), and hyperfocus. It aims to address the gap in understanding how these states manifest in individuals with autism and ADHD, highlighting their similarities and differences compared to conventional flow characterizations.

Methods: This review adheres to PRISMA-ScR guidelines and includes studies from peer-reviewed articles and grey literature, identified through a systematic search of bibliographic databases (Web of Science, APA PsycInfo, Embase, MEDLINE, ProQuest Dissertations & Theses Global, CINAHL), Google Scholar, and citation searching. The search applied no limits on publication type, study type, language, location, or year of publication. Two independent reviewers screened titles and abstracts, resolving discrepancies through discussion, with a third reviewer consulted as needed. Data extraction focused on study design, methodology, flow-related constructs, and findings.

Results: This review imported 2,677 studies from databases and 5 from other sources for screening. After removing 31 manually identified and 1,028 automatically identified duplicates through Covidence, 1,623 studies remained for title and abstract screening. Of these, 1,431 were excluded, leaving 192 for full-text screening, and finally excluding 153. Ultimately, 39 studies were included: 33 empirical (including 4 theses/dissertations), 4 reviews, 1 book, and 1 reflective narrative conference paper (see Figure 1). Neurodivergent attentional experiences differed notably from typical flow. For autistics, monotropic focus and sensory integration drove flow, with special interests sustaining attention. However, these factors led to challenges, such as autistic inertia, making task initiation and transitions difficult. Hyperfocus in ADHD involved intense concentration, but lacked the structured goals and control typical of flow. While all attentional states shared common features, the most overlap occurred within neurodivergent states (see Table 1).

Conclusions: There are similarities among flow, hyperfocus, autistic inertia, and monotropism, with even greater overlap within neurodivergent attentional states. Unlike NTs, who are unlikely to transition between these states, those with autism and/or ADHD may shift fluidly during a single focus period. This fluidity can be beneficial, as hyperfocus and monotropism may enhance productivity and engagement, particularly when tasks align with personal interests. However, neurodivergent individuals may also face increased vulnerability to the effects of being locked into or out of these states. Understanding these interactions and their relation to flow helps provide tailored support, enabling neurodivergent individuals to manage focus and mitigate negative impacts.



410.120 Hot or Cold? Executive Functions in Autistic and Non-Autistic Adolescents

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Background: Executive functions (EFs) are control processes that are essential for goal-directed behavior.^{1,2,3} Researchers have highlighted a distinction between cold EFs, involved in non-emotional tasks, and hot EFs, engaged during tasks with affective or motivational demands.^{4,5,6} Hot EFs appear to require emotion regulation, an area known to differ in autism,⁷ and are thought to be more impacted in autism than cold EFs.⁸ However, only two studies have directly compared them in autistic samples.^{8,9}

We use the Executive Function Challenge Task (EFCT)⁵, a measure of hot EFs in social interaction, and the Wisconsin Card Sorting Test (WCST)¹³ to explore the hot-cold EF distinction in adolescence, a key period for EF development.¹⁰ As a control, we use the Behavior Rating Inventory of Executive Function (BRIEF)¹¹, which provides an informant-based assessment of real-world executive functioning.¹²

Objectives: We explore relationships between hot and cold EF tasks in autistic and non-autistic adolescents. We hypothesize that emotion regulation difficulties in autism may reduce performance on hot EF tasks in particular, resulting in little relationship with cold EF performance. Non-autistic participants, however, may show a stronger correlation between hot and cold EFs. Additionally, on the basis of shared ecological validity,³ we expect the BRIEF to show a stronger correlation with hot than cold EFs in both groups.

Methods: Data collection is ongoing, with 14 autistic and 27 non-autistic adolescents (ages 14-18) tested. They were matched on age, gender, and nonverbal IQ (all p-values > .05). **Cold EFs** were assessed by the number of perseverative errors on the WCST. **Hot EFs** were measured by the EFCT total raw score. The Parent Report Form of the BRIEF was our **control** measure. Higher scores on all measures indicate greater EF difficulties.

Results: Consistent with our first hypothesis, preliminary data show a stronger relationship between hot and cold EF tasks in non-autistic ($\rho = 0.18$) than in autistic participants ($\rho = 0.08$), although associations are modest (Figure 1, top right panel). Our hypothesis concerning the BRIEF was not supported. For the non-autistic group, correlations between the BRIEF and both EF tasks were negligible ($\rho = -0.07$ vs. -0.03). In the autistic group, we found moderate correlations, however in different directions. There was a small-medium positive correlation between the BRIEF and hot EF as predicted ($\rho = 0.22$), and a stronger inverse correlation with cold EF ($\rho = -0.35$). This would indicate that better performance on the WCST in the lab was associated with *worse* EF as observed by caregivers in daily life.

Conclusions: Our preliminary findings suggest that non-autistic participants show a stronger correlation between hot and cold EFs than their autistic peers, supporting our hypothesis that emotion regulation may specifically impact hot EFs in autism. In the non-autistic group, the weak association between informant-based BRIEF and adolescents' EF task performance may reflect reduced caregiver insight into their child's cognitive skills during adolescence. For autistic individuals, the inverse relationship between cold EF task performance and BRIEF scores may indicate differences between lab-based and real-world EF abilities as perceived by caregivers.



410.121 Information Processing during a Sequence of Social Problem-Solving: Comparison between Adolescents with and without HFASD

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Background:

Social problem-solving is a critical skill for adapting into a dynamic social environment. Difficulties in the ability to solve social problems within a social environment may lead to challenges in social adaptation. Social Information Processing (SIP) model proposes several steps of cognitive processing to solve social problems: encoding, interpretation, goal selection, generating responses and decision-making. SIP has been used to examine social problem-solving patterns among various populations, including high-functioning autism. Findings regarding the autism population are mixed; whereas some findings demonstrated that autistic individuals generate ineffective solutions and tend to attribute anti-social intentions to others, other studies did not demonstrate such discrepancies. As SIP was not specifically designed for ASD, further research is critical to identify the cause for such mixed results. Recent research on patterns associated with information processing of high-functioning autistic individuals demonstrated a tendency to focus on perceptual and local information rather than on semantic global components that creates coherence. However, when provided with explicit guidance on how to process the information, this pattern was not evident.

Objectives:

To examine associations between unique information processing patterns found among autistic individuals and social problem-solving processes according to the SIP model, with the use of adapted research tools.

Methods:

Participants: 15 high-functioning autistic and 15 age-matched neurotypical adolescents, ages 10-16. A text describing a series of typical social situations was developed for the study. The tool included scripts describing various problems that arose during school-break, which required decoding and decision-making on how to behave following each scripted situation. The situations were interconnected, creating an overall occurrence forming a chain of events. Each scripted situation included open-and closed-ended questions.

Results:

Findings demonstrate significant differences between groups in answers to the open-ended questions, with the autistic participants tending to focus on non-essential information components related to each situation, while making limited connections between various scenes across and within situations. In contrast, when presented with the possibility to choose between answers in the close-ended options provided to each of those questions, there were no significant difference between the groups.

Conclusions:

Results demonstrate a clear pattern in which when presented with open-ended questions and a wide range of possibilities, autistic adolescents tended to select local limited solutions to the social problems with little regard to previous situations. However, when faced with close-ended possible solutions, sufficient hints were provided thus enabling them to process the information and provide better social problem-solving solutions. Hence, findings demonstrate how the unique information processing patterns of autistic individuals might be manifested in everyday social problem-solving. The findings suggest that difficulties in this area might be related to information processing patterns with a variety of options and minimal guidance toward a preferred choice. These findings may explain the inconsistency found in studies on SIP model and autism, as differences between answers could relate to the method used for obtaining information, i.e., open- versus closed-ended questions rather than the social problem-solving issues.

410.122 Investigating Spontaneous Musical Improvisation As a Mediating Cognitive Language in Children with Autism Spectrum Disorder

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Background: Research has shown that autistic children often have an unusual interest in and response to music, excelling in pitch and timbre processing, melodic memory, and rhythm synchronization. This study explores spontaneous musical improvisation in autistic children compared to their neurotypical peers to reveal music's potential as a mediating cognitive language.

Objectives: This study aims to analyze the quality of spontaneously produced tone sequences of children with autism spectrum disorder (ASD) compared to neurotypical (NT) children. Additionally, it investigates music as a medium to facilitate performance and response in children with ASD.

Methods: Thirty participants aged six to twelve were recruited, with fifteen diagnosed with ASD and fifteen neurotypical children. Participants engaged in free, spontaneous improvisation on a xylophone, and their performances were recorded and analyzed using a Musical Analysis Scale (MAS) across dimensions such as rhythm, restriction, complexity, rule adherence, and originality. Independent samples t-tests were conducted to compare the groups. The study also examined the effects of age and diagnosis on performance using a two-way ANOVA.

Results: The analysis indicated that the tone sequences produced by children with ASD did not significantly differ from those of their neurotypical peers, with one exception. A significant difference was found in the originality component, with the ASD group scoring lower than the NT group ($p = .03$), suggesting that the NT group demonstrated more unique musical elements. For the total score, representing overall musicality based on the MAS, there was no significant difference between the ASD group and the NT group ($p = .36$). Additionally, a significant interaction effect between diagnosis and age group was found for the total score ($p = .02$), indicating that younger children with ASD had lower total scores compared to older children with ASD and younger NT children. Further testing revealed no significant differences in mean total scores between the ASD and NT groups ($p = .37$) or between the younger and older age groups ($p = .46$), indicating that the interaction between diagnosis and age primarily drives the observed differences.

Conclusions: The findings of this study indicate that music facilitates the performance and response of autistic children, supporting the limited existing research on this topic. The improvisational nature of the test allowed autistic children to engage more freely, suggesting that music can help overcome typical challenges faced by individuals with autism. Understanding how children with autism interact with music provides valuable insights into using music to facilitate non-musical skills, such as language and motor abilities. These findings highlight the potential for developing structured tests to evaluate musical skills in greater detail, ultimately leading to more effective educational and therapeutic interventions that leverage the strengths of autistic individuals and improve their overall development.



410.123 Investigating the Associations between Arousal Level, Distracter Filtering, and Autistic Traits

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Background: Arousal level plays an important role in the ability to filtering irrelevant information. Arousal regulation difficulties are present in autism, and autistic individuals commonly report atypical hyper- and hypo-responsivity to external sensory stimuli. However, relationships between arousal level, distracter filtering, and autistic traits are not well understood.

Objectives: To investigate the associations between arousal level, as measured by resting pupil diameter and EEG alpha power, distracter filtering in visual (cued flanker) and auditory (word-in-noise) domains, and autistic traits in neurotypical adults.

Methods: Participants included 80 undergraduate students. Autistic traits were measured by Broad Autism Phenotype Questionnaire (BAPQ) and attention to detail score was measured by average z-score of attention to detail subscale of AQ and Detailed and Flexibility Questionnaire (DFlex).

The study included three experiments: 1) a resting EEG and eye-tracking task to measure pupil diameter and alpha power as indirect measures of resting-state arousal level, 2) a cued-flanker paradigm to measure congruency effect (RT of incongruent-congruent conditions), and 3) NIH toolbox Word-in-Noise as measures of distracter filtering irrelevant information in visual (2) and auditory (3) domain. For resting-state task, participants were asked to look at a black central crosshair, which was displayed on a gray background. For a cued-flanker paradigm, isoluminant stimuli (cue, arrows) were presented on a gray background. Participants were instructed respond to the direction of center arrow. Pupil diameter was monitored using an EyeLink 1000 Plus remote eye-tracking system and EEG was recorded using 128-channel high-density Geodesic electrode array. For NIH toolbox Word-in-Noise task, participants are asked to say the word that they hear from right or left ear when noise is presented.

Results: Congruency effect during a cued flanker task was not significantly correlated with any arousal measure. The Word-in-Noise task raw score for left-ear and across both ears was negatively related to resting pupil diameter. In addition, increased resting-state alpha activity at left posterior ROI was positively correlated to Word-in-Noise task raw score for right-ear ($p < .05$). Contrary to hypothesis, our arousal measures were not significantly correlated to autistic traits, including attention to detail. The attention to detail was negatively correlated to Word-in-Noise task raw score for left-ear and across both ears ($ps < .05$). BAPQ total was marginally related to congruency effect ($r = -.21, p = .066$) and word in noise raw score across both ears ($r = -.22, p = .054$).

Conclusions: As hypothesized, our findings show that increased arousal level is associated with greater difficulty filtering irrelevant information. This pattern was present for auditory, but not visual, stimuli. Additionally, autism traits were associated with both visual and auditory filtering, and attention to detail was significantly related to auditory filtering abilities. These findings expand our understanding of arousal regulation in filtering distracters in visual and auditory domains that may be linked to attention to detail of autistic traits.



410.124 Is Home Literacy Environment (HLE) Associated with Reading Performance in Brazilian Children with Autism Spectrum Disorders (ASD)?

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Background: Autism spectrum disorder (ASD) is a neurodevelopmental disability that significantly affects communication, which contributes to reading difficulties for individuals with ASD. Although literacy is not a core impairment of ASD, many studies have shown that children with ASD are disproportionately affected by literacy challenges. The home literacy environment (HLE) refers to a combination of literacy-related resources, attitudes, and activities provided by caregivers. The HLE has been proven to contribute to the development of children's oral language and literacy skills, especially in typically developing children. Despite the potential benefits of home reading activities on the literacy development of children with ASD, few studies have examined this issue, and none have been conducted with Brazilian children from diverse socioeconomic backgrounds. **Objectives:** To investigate the relationship between the HLE and reading accuracy and comprehension performance in children with ASD and Level 1 support.

Methods: This correlational study included 22 Brazilian children ($M = 11.3$ years, $SD = 3.55$), 81% boys, all diagnosed with ASD and with preserved formal oral language. The measures used were parental education (mother's and father's years of education as a component) and the Early Literacy Questionnaire (completed by parents). The children were evaluated individually with the Teste de Desempenho Escolar – TDE II (a Brazilian validated test assessing reading accuracy, spelling, and arithmetic according to elementary school grades) and the Teste de Compreensão Leitora Textual - COMTEXT-ANELE 2 (a Brazilian validated test assessing text reading comprehension). Data were analyzed using Spearman's correlation.

Results: The correlations indicated that parental education was positively associated with reading accuracy in children with ASD ($\rho = .478$, $p = .03$). The amount of time parents spent reading books to their child at once was positively associated with text reading comprehension ($\rho = .424$, $p = .04$). However, the frequency of parental reading was not significantly associated with either reading accuracy or text comprehension ($p > .05$). **Conclusions:** The results suggest a positive impact of the HLE on the development of different reading skills and potential educational gains when children with ASD are exposed to shared reading, as is observed in typically developing children. The HLE may be influenced by parental education, making it important to investigate how parental education mediates the direct effects of the HLE on reading development in children with ASD. The findings indicate that Brazilian children with ASD from diverse socioeconomic backgrounds can benefit from a rich HLE in achieving reading proficiency.

410.125 Is Learning You Are Autistic Earlier in Development Associated with Success in College for Autistic Students?

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Background:

Project PEACES takes a strengths-based approach to improving postsecondary outcomes for autistic students by learning from successive waves of autistic students what success in college means to them. One factor that may impact outcomes is age of learning one is autistic. Learning one is autistic earlier was associated with greater Quality of Life (QoL) and well-being among autistic students (Oredipe et al., 2021). Females and older students learned they were autistic later. However, age of learning vs. age of diagnosis were not distinguished. Autistic females in a non-college study were also diagnosed later; later diagnosis was associated with lower QoL and heightened autistic traits (Atherton et al., 2022). A pre-registered non-college study revealed positive baseline correlations between learning one is autistic/being diagnosed earlier, QoL and well-being (Leung et al., 2023). However, associations were no longer apparent after including autistic traits, age and gender. Large and diverse college-student samples are needed to determine if age of learning one is autistic is reliably associated with positive outcomes.

Objectives:

1. Explore disparities in age of autism identification among autistic college students;
2. Determine if age of learning one is autistic and/or age of diagnosis are associated with success among two diverse waves of autistic college students.

Methods:

Autistic college students in the U.S. completed an online survey assessing demographics, age of learning one is autistic, age of diagnosis, and perceived success in college across 5 domains (IPACE; Identity, Psychology, Academics, Community, and Employment).

In Fall 2022 (Wave 1; Table 1), 288 participants reported an autism diagnosis (required to investigate associations between age of diagnosis and outcomes). In Fall 2023 (Wave 2), 310 participants were diagnosed.

Results:

In Waves 1&2, younger students and men were diagnosed and learned they were autistic earlier; non-binary students learned and were diagnosed later ($ps < .02$). In Wave 2, women learned later ($p < .05$). Ages of diagnosis and learning were unrelated to race/ethnicity ($ps > .19$).

In Wave 1, earlier ages of diagnosis and learning were associated with greater self-reported employment and community success ($ps < .04$) but not other IPACE domains.

In Wave 2, earlier diagnosis and learning were associated with greater success in the psychological domain ($p = .003$). Gaps between learning and diagnosis were unrelated to success ($ps > .19$).

Conclusions:

Gender minorities and older autistic college students experience persistent disparities in access to autism diagnoses/information, which may impact self-understanding. Although age of learning one is autistic/age of diagnosis were associated with adult outcomes in this and prior studies, the pattern of associations is not consistent. Wave 1 findings align with evidence that earlier autism diagnoses are associated with better organizational self-esteem and reduced workplace discrimination among autistic employees (Johnson & Joshi, 2016). Wave 2 findings align with the aforementioned associations between age of learning one is autistic and/or receiving a diagnosis and psychological outcomes. Findings highlight the value of large-scale replications for understanding factors that shape outcomes for autistic students. Future work should investigate potential explanatory factors including autistic traits and mental health conditions.



410.126 Reduced Serial Dependence during Perceptual Learning in ASD Is Linked to over-Specificity of Learning

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Background:

Perceptual decisions are often biased toward recent stimulations (the serial dependence effect), which is thought to support sensory integration and maintain perceptual stability over time. Here we consider the role of serial dependence in perceptual learning and its generalization in ASD where learning is often rigid and specific. Previous research has shown that high-functioning adults with Autism Spectrum Disorder (ASD) initially exhibit efficient learning in a standard texture discrimination task (TDT). However, when the target location was changed, these individuals experienced anomalously poor learning transfer (over-specificity). Interestingly, this over-specificity was eliminated in an experimental condition designed to reduce stimulus adaptation.

Objectives:

This study aims to investigate the effects of serial dependence during a TDT in high-functioning adults with ASD compared to matched controls, specifically examining how any differences between the groups relate to learning generalization or specificity.

Methods:

We reanalyzed data from a previous TDT study (Harris et al., Nat. Neurosci. 18, p1574, 2015), in which participants identified the orientation (vertical or horizontal) of a peripheral texture target while simultaneously performing a forced-choice letter discrimination task to maintain fixation. Two conditions were compared: (1) a 'standard' condition with consistent target presentations in all trials (10 ASD, 9 controls), and (2) a 'dummy' condition, where targetless trials were randomly interleaved with standard trials to reduce stimulus adaptation (10 ASD, 10 controls). The experiment spanned eight daily sessions, with the target location changed after the fourth session to test for learning generalization. Serial dependence biases were quantified using a linear mixed model, assessing the influence of prior N-back target orientation on current target judgments.

Results:

Both ASD and control groups exhibited response biases toward prior target orientations (significant up to seven trials back), with strongest biases when current targets were unreliable and prior targets were highly reliable, consistent with Bayesian perceptual models. For recent history (1-3 trials back), ASD observers showed approximately 30% less serial dependence compared to controls in both conditions. However, for more distant history (4-10 trials back), serial dependence in ASD observers remained lower under the 'standard' condition but matched control levels in the 'dummy' condition.

Conclusions:

The overall reduced serial dependence in ASD observers under the 'standard' condition is linked to their over-specificity. In contrast, the distant effects in the 'dummy' condition, which were enhanced relative to the 'standard' condition and matched the levels seen in controls, appear to facilitate learning generalization. This extended memory trace, integrating information from multiple prior trials, may help create a generalized learning template across contexts, preventing overfitting to individual stimuli and promoting learning transfer. These findings provide insights into the mechanisms underlying perceptual learning and generalization in individuals with ASD and suggest potential strategies for improving learning transfer in this population.

Poster Session**411 - Diagnostic, Behavioral & Intellectual Assessment I**

May 1st, 2025, 5:30 PM - 6:30 PM - Hall 4A

411.127 Tele-ASD Diagnostic Assessment Tool for Adolescents/Adults (TADA)

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Background: Timely and accurate identification of autistic individuals is a pressing public health challenge for all age groups. It is increasingly recognized that many autistic individuals are not identified as young children, and that accurate first-time diagnosis of autistic adults can promote autonomy, inclusion, and happiness across the lifespan. Unfortunately, when questions about autism emerge for undiagnosed adults, it is hard to find local pathways for evaluation. Telemedicine has been proven to address many barriers to diagnostic care access related to geography and provider availability. While considerable research has investigated the use of telemedicine to diagnose autism in young children, there are currently no psychometrically sound, validated tele-assessment tools that were designed for and with autistic adults.

Objectives: The overall goal of this project was to develop and evaluate a tele-assessment tool and procedure that supports diagnostic decision-making for adults presenting with concerns regarding autism. We proposed a computationally informed co-production process for development and evaluation of the tele-assessment tool. This process ultimately was designed to fuse advanced computational analyses with shareholder expertise by (1) mining a clinical database to identify behavioral targets indicative of autism and (2) translating these behaviors into telehealth assessment procedures in partnership with autistic adults and international experts in autistic adult assessment. Here, we present results of the computational analyses and identified feature sets.

Methods: We applied our previously established machine learning and feature engineering approach to a phenotypically rich clinical research data set (i.e. ADOS-2, Vineland, cognitive data, and other measures) of autistic adults and those with other diagnoses. Our computational approach began with a principal component analysis designed to identify the features most predictive of diagnostic status (autistic / other classification). We hypothesized that such features would be composed primarily of ADOS-2 codes, but with specific language/cognitive and adaptive behavior differences likely included.

Results: A sample of $n=214$ adolescents and adults (46% male; 72% autistic) ages 14 - 64 was randomly partitioned using a 70-30 split into a training set ($n=150$) and holdout set for validation ($n=64$). Of the models applied, a k-neighbors classifier ultimately yielded an accuracy of 90.7% or an unweighted average recall [UAR] of 90.5% with high sensitivity (91%) and specificity (90%). Across the theories of computational models, we attempted to identify the 10 most influential item sets from the best performing data and models (see Table 1). Of note, computational analysis identified slightly differing models among male and female participants with additional substantial overlaps and larger accuracy for females (see Table 2).

Conclusions: A relatively modest number of clinical features produced high levels of accuracy in differentiating autistic adults from adults with other concerns. Co-producing a tele-assessment tool for autistic adults via fusion of these computational results with clinical and lived expertise holds promise for creation of a novel tele-assessment tool. Results of ongoing work around tool construction and pilot data of accuracy in use will also be presented.



411.128 Understanding and Minimizing Reporting Discrepancy of Anxiety Symptoms in Children with Autism Spectrum Disorder
S. C. Boland¹ and **T. D. Barry²**, (1)Washington State University, Pullman, WA, (2)Psychology, Washington State University, Pullman, WA

Background: The caregiver- and self-reporting process is an essential component of clinical assessment and intervention for youth. Whereas research consistently supports differences in reporting (i.e., discrepancy) between autistic youth and their caregivers when rating internalizing symptoms, the nature of the discrepancy (e.g., which informant reports more or less symptoms, extent of agreement) remains mixed (e.g., Barbeau et al., 2020; Eussen et al., 2013). Furthermore, there is currently no known literature on how psychoeducation with facilitated discussion impacts the gaps in perception between caregivers and youth with ASD.

Objectives: The study aimed to assess: (1) factors that may contribute to informant reporting discrepancy between parent- and self-reports in internalizing symptoms among youth with ASD; (2) the efficacy of a psychoeducational intervention on reducing anxiety-related informant reporting discrepancy; and (3) potential moderators of intervention efficacy.

Methods: Participants were 79 caregivers and autistic youth (ages 10-17) who completed a series of questionnaires measuring youth internalizing symptoms. Parents also completed measures of self-reported distress and child ASD symptoms. If significant discrepancy between scores existed, families were randomly assigned to either an intervention or control condition. The intervention condition included an informational pamphlet on discrepancy and a Zoom-based joint outreach session to facilitate discussion about differences in scores and perceptions of the youth's anxiety. All youth completed a brief intelligence test, and all families repeated questionnaires 2-3 weeks post initial surveys. Families in the control group completed no tasks in between Time 1 and 2.

Results: Analyses tested correlations linking youth report and caregiver report of anxiety with verbal IQ (VIQ), ASD symptom severity, and caregiver distress. Polynomial regression equations were used to test the interaction hypotheses and the constraints imposed by directional and quadratic difference scores. Separate regression analyses were conducted to assess how VIQ, ASD symptom severity, and caregiver distress related to discrepancy on three measures of internalizing symptoms (SCARED Total, BASC Anxiety scale, and BASC Depression scale). Youth scores of anxiety (or depression) symptoms were regressed on caregiver scores of youth anxiety (or youth depression) symptoms and the predictor variable of VIQ, ASD symptom severity, or caregiver distress (for a total of nine polynomial regression models). All predictors were mean centered. Across the polynomial regression models, many of the interaction terms were significant demonstrating significant discrepancy between parent and youth reports on internalizing symptoms moderated by these variables. Additional analyses will examine demographic moderators and change in discrepancy from Time 1 to Time 2 based on intervention status.

Conclusions: There is evidence to suggest informant discrepancy affects longer-term child and family outcomes (e.g., Brookman-Frazee et al., 2008; Verhoeven et al. 2012). The current study aims to serve as a precursor to such research, adding a unique contribution to discrepancy research. This complex examination of reporter discrepancy using state-of-the-art techniques yields promising results for better understanding the nuance of youth symptom assessment. Full analyses of intervention efficacy will be completed prior to presentation.

411.129 Using Daily Phone Diaries to Examine the Everyday Activities of Autistic Adolescents

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Background: While it is known that autistic teens without an intellectual disability (ID) may face challenges in areas including social skills, daily living skills (DLS), executive functioning, and emotion regulation, we know less about how these difficulties may impact their daily activities. Ecological momentary assessment and interviews have been used to examine daily activities, but these methods have limitations (e.g., rely on accurate memory recall, only collect data at specific intervals). The daily phone diary (DPD) is a comprehensive measure administered by an interviewer to construct a timeline of daily activities that a person engaged in over the last 24 hours. To our knowledge, no studies have utilized DPDs with autistic teens to examine the nature of their daily activities.

Objectives: To use DPDs to (1) examine the daily activities of autistic adolescents without ID, with a focus on the areas of DLS, social skills, and academics; and (2) examine teen's self-reported affect and companions during activities.

Methods: Teen in the study met inclusion criteria for a RCT that included (1) a diagnosis of autism; (2) $IQ \geq 70$; and (3) caregiver reported DLS challenges. Participants included 48 autistic teens (14 to 16 years, $M=15.3$, $SD=0.69$; 72.9% male; 83.3% White) without ID ($IQ M=100.9$, $SD=10.3$). All teen participants completed 3 consecutive DPDs (2 weekday, 1 weekend) at baseline. A trained interviewer called teens and had them walk through the last 24-hours and report any activities that lasted at least 5 minutes. Teens were asked to rate their emotional state on a 5-point scale from Very Positive to Very Negative. Interviewers coded the teen's activities into the categories of DLS (Personal, Domestic, Community), Social (Recreation at Home, Recreation Outside of the Home, Peer Interactions), and School (Homework/Studying, School Activities). Teens reported on any companions with them during activities. Descriptive statistics are being used to calculate the frequency of activities in each category/subcategory.

Results: Data collection is complete. We have cleaned DLS category data (see Figure 1). Results indicated that teens completed few Community DLS (total = 5), but completed a range of Domestic DLS (total = 106) and Personal DLS (total = 390). The DLS teens completed the most were Oral/Teeth Care (total = 97), Morning/Nighttime Hygiene Routine (total = 67), Hygiene Tasks (total = 63), Showering (total = 59), Cooking (total = 43), Medical Care (total = 26), and Cleaning Room (total = 20). Teens completed an average of 6.5 DLS per day, and of those 4.17 were completed independently. The entire data set will be cleaned and analyzed by December 2024.

Conclusions: Preliminary results reveal that autistic teens report completing a range of DLS during their everyday lives, but they are completing fewer DLS than would be expected based on their age and still requiring assistance from caregivers for about one-third of DLS. Further, few teens are engaging in Community DLS (e.g., purchasing items, going grocery shopping). The results have implications for interventions targeting essential skills that are needed to facilitate a successful transition after high school graduation.



411.130 Utility of the ASRS in Autism Diagnosis in a Pediatric Subspecialty Practice

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Background: Recent estimates show that the prevalence of Autism Spectrum Disorder (ASD) has increased to 1 in every 36 children across the United States since 2018. Timely intervention for children with ASD is critical in reducing long-term impacts associated with this condition, given that symptoms typically manifest during early childhood. Several ASD screening tools and parent reports, such as the Autism Spectrum Rating Scale (ASRS), are available to diagnosticians that are designed to enhance diagnostic accuracy, streamline the diagnostic process, and assess caregiver report of symptomatology. The authors of the ASRS report adequate reliability and validity, however, more research investigating the accuracy and utility of the ASRS as a diagnostic tool in pediatric subspecialty clinic practice is needed.

Objectives: N/A

Methods: The setting for this research is a pediatric subspecialty clinic affiliated with a children's hospital and a medical school in the SouthEastern United States. Between November 2023 and May 2024 every patient referred by their primary care provider for autism evaluation to the pediatric subspecialty practice was administered the ASRS as part of referral appointment intake process. Depending upon the age of the patient, either the ASRS parent report form A (ages 2- 5) or B (ages 6-18) was given to the primary caregiver by the psychometrist at one of two points in the process: following the intake appointment or during the testing appointment. A full autism evaluation utilizing a structured observation measure and diagnostic history interview as a minimum was then completed by either a psychologist or medical provider. A retrospective chart review was conducted on all new patient appointments during this time period. Inclusion criteria for this project was completion of both a parent ASRS and full autism evaluation resulting in a diagnostic decision. A total of 179 patients between the ages of 2 and 18 met inclusion criteria. Demographic data, ASRS total score, and Autism diagnostic decision data were analyzed to assess the efficacy of the ASRS within this patient sample.

Results: Receiver operating characteristic (ROC) curves for forms A and B yielded an area under the curve (AUC) of 0.596 and 0.463, respectively. Form A performed slightly better than chance while B performed worse than chance. Neither form met the threshold for a fair screening tool ($AUC \geq 0.70$), indicating a low diagnostic accuracy. Sensitivity was highest for ASRS forms A and B at the cut off value of 60 (compared to 65 and 70), however, the low specificity values at this cut off value indicate a high false positive rate.

Conclusions: Overall, the low sensitivity and specificity values indicate that the ASRS was a poor predictor of ASD diagnosis in this research sample. Data indicate that the ASRS had limited incremental value as part of the core diagnostic battery in our pediatric subspecialty clinic. Results led to the decision to revise clinic policy to discontinue mandatory use of the ASRS during our referral intake process and recommend less reliance on ASRS data as part of the diagnostic decision.

411.131 A Pilot Feasibility Study of Hybrid and Virtual Autism Assessments in Rural Appalachia: Addressing Barriers to Diagnosis

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Background: Access to formal autism diagnosis is critical for children to get early intervention. In rural Appalachian communities, obtaining a diagnosis is challenging due to a scarcity of specialists, resulting in families traveling long distances and facing years-long waitlists (Scarpa et al, 2020). This problem highlights the need for accessible alternatives to traditional in-person assessments to improve access to diagnoses and associated services. Prior studies suggest telehealth as a viable alternative (Dahiya et al., 2021), but no studies have assessed feasibility in rural Appalachia.

Objectives: This study aims to evaluate the pilot feasibility of using hybrid (in-person/virtual) and fully virtual diagnostic autism assessments for children from rural Appalachia.

Methods: Caregivers and their children were recruited from 15 counties in rural Appalachian Virginia. Families were eligible if their child was between 16 months through 17 years old, suspected of autism, scored above the clinical screening cutoff, and did not have a prior autism diagnosis. Data included the child's age, gender, and scores on parent-report screening instruments, including the Social Responsiveness Scale – 2nd Edition (SRS-2) and the Modified Checklist for Autism in Toddlers, Revised (M-CHAT-R). Children received a comprehensive diagnostic assessment using either a hybrid or fully virtual approach, including a developmental history, child observation, diagnostic interview, and intellectual, language, and adaptive functioning. Caregivers then completed the Acceptability of Intervention Measure, Intervention Appropriateness Measure, Feasibility of Intervention Measure, and an overall satisfaction survey to assess acceptability, appropriateness, feasibility, and satisfaction with the two assessment formats.

Results: Within 4 months, 119 families from 15 counties expressed interest in receiving autism assessments. Among them, 66% ($n=78$) of caregivers completed SRS-2 and M-CHAT-R screeners, with 94% ($n=73$) of those scoring in the moderate to severe range, indicating high likelihood of an autism spectrum disorder diagnosis. Of the 73 children (20 female, 35 male, 18 unreported) suspected of an autism spectrum diagnosis, ages ranged from 2 to 17 years old, with a mean of 7 years 11 months ($SD=4.32$). In the subsequent two months, five hybrid and six fully virtual comprehensive diagnostic assessments have been conducted, with post-assessment feasibility data completed by 7 caregivers (Mean completion = 1 family/week). Preliminary pilot data indicated that 100% of these 7 participants receiving virtual ($n=5$) or hybrid ($n=2$) assessments indicated either “Agree” or “Completely Agree” on every feasibility item assessed. At the rate of 1 family per week, we anticipate complete data on 20-25 more of the 73 eligible families by end of April 2025.

Conclusions: Autism diagnostic assessments remain limited in rural communities despite significant demand. The average age of children was 7 years 11 months, which is much later than the national average of 5 years (National Autism Data Center, 2024) for first identification of autism, suggesting many young children are not identified and thus limiting access to early interventions and services. Initial findings indicate that hybrid and virtual assessments are an acceptable and accessible method for reaching rural Appalachian populations, potentially bridging the gap in autism services in the U.S.

411.132 A Systematic Review of Adult-Reported Self-Regulation Measurement in Children Aged 0-8 Years

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Background: Self-regulation is a multidimensional construct that includes three components: emotional, behavioral, and cognitive regulation (McClelland et al., 2010), which is a critical teaching target in early childhood. Yet, there is a lack of consensus on the definition of self-regulation, with diverse opinions on what facets, specific processes or skills/abilities, should be included (e.g., Jones et al., 2016; Karoly, 1993). To analyze, assess, and improve self-regulation skills in young children, and to evaluate the effectiveness of intervention programs, a clear definition and precisely targeted measures are critical.

Objectives: The purpose of this systematic review is to: (a) identify valid adult-reported measure of self-regulation in early childhood (i.e., 0-8 years), (b) characterize domains and facets of self-regulation assessed by these measures, and (c) analyze and extract the behavioral expressions of self-regulation across measures to inform research and practice supporting the development of young children's self-regulatory skills.

Methods: Published peer-reviewed articles were searched. After the removal of duplicates, five reviewers independently screened the titles and abstracts. Two reviewers independently assessed the full texts of the included studies and extracted informant based self-regulation measures from studies. Through analysis, a three-tiered classification system was established, starting with the most detailed processes (*facets*), which form the *domains* that, in turn, contribute to the broader *categories*. To support the third objective of this systematic review, a preliminary table of behavioral expression of the facets was generated. *Behavioral expression* refers to the observable behavioral performance that reflects these self-regulatory skills and processes. Inter-rater agreement was calculated for each section and ranged from 68.57% to 100%.

Results: In total, 20 measures were included in this review, which covered the cognitive, emotional, and behavioral aspects of self-regulation and could be used for children aged 3 months to 8 years. From the measures, 138 unique terms were extracted. Coders assigned a single facet code to different terms that describe the same concept, while assigning different facet codes to similar terms with different definitions, resulting in the creation of 62 final facet codes. After comparing the facet codes with self-regulation terms reported in reference articles, the reviewers identified 28 facets that represented the self-regulation skill (see Table 1), 8 facets that represented concepts broader than self-regulation, and 28 facets categorized as not representing self-regulation skills. The domains and categories of regulation for each facet were determined and are presented in Table 2, and 24 behavioral expressions of self-regulation skills were created and reported in Table 3.

Conclusions: This study is the first literature review to systematically investigate adult-reported measures of self-regulation in young children aged 0-8 years. Among those reviewed, measures were designed to capture caregiver and teacher reports of young children's self-regulation skills. Based on the results of the analysis, this review suggests that conceptual unification can enhance the understanding of self-regulation, and inform the development of a behavioral coding scheme to directly assess children's self-regulatory skills.



411.133 Acceptability and Feasibility of a Community-Delivered, Digital Tool for Neurodevelopmental Profiling

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Background:

Timely identification of children at risk for developmental delays is hindered by lack of skilled professionals in low-and-middle-income countries, and reliance on lengthy assessment measures developed and normed in high-income countries. A portable, culturally adaptable assessment of neurodevelopment that can be administered by non-specialist workers (NSWs) can facilitate early intervention.

Objectives:

The STREAM project has developed and is currently validating a tablet-based, open-source, scalable tool, deliverable by NSWs in low-resource environments, to assess cognitive, social and fine motor development across diverse cultural settings. One key aim of this platform is to facilitate early detection of children with neurodevelopmental disorders, including autism.

Methods:

STREAM has adapted and combined three existing tools (1) Malawi Developmental Assessment Tool (MDAT), evaluating motor, social, and language abilities through observation and parent reports (Gladstone et al., 2010); (2) DEvelopmental assessment on an E-Platform (DEEP), assessing cognitive skills via gamified tasks (Bhavnani et al., 2019); and (3) Screening Tools for Autism Risk using Technology (START), evaluating social and sensory preferences (Dubey et al., 2024). The STREAM app has been designed to be culturally agnostic and administered offline by trained NSWs. It has been piloted with children in New Delhi, India and Blantyre, Malawi.

Results:

Data on STREAM have been collected in India and Malawi, respectively, from 1851 and 1880 children aged 0-6 years (50% girls) from communities and 104 and 155 children (33% and 39% girls respectively) diagnosed with, or at risk of, neurodevelopmental disorders including autism spectrum disorder (ASD), intellectual disability and cerebral palsy. Families of community-based children at both sites approached to participate in the study were interested (97.3% in India, 99.4% in Malawi), though this rate was reduced for children with neurodevelopmental disorders in India (64.16%, versus 97.8% for Malawi). In India, 26% of community-based children and 24.3% of children with NDDs were stunted (height-for-age z-score less than 2 standard deviations from the mean). In Malawi, these figures were 32.4% for community-based children and 40.7% for children with NDDs. Amongst children from the community, in India 6 and in Malawi 4 of the 12 STREAM tasks evoked 100% completion rates and the remaining tasks ranged from 97% to 99.5%, demonstrating high acceptability and feasibility of STREAM administration. These were reduced amongst children with neurodevelopmental disorders, ranging from 18-99%, simple gaze and visuomotor tasks being most consistently completed.

Conclusions:

STREAM, as administered by NSWs, constitutes an acceptable and feasible assessment of children's neurocognitive development. By the end of 2025, this study will provide reference data for the early childhood period (0-6 years) on key domains of cognition, social and fine motor domains, including test-retest reliability and sensitivity to change. Data will be validated against a) chronological age, b) Griffiths Mental Development Scales as a gold-standard measure of child development, c) height-for-age and d) risk factors known to negatively impact development. Once validated, the STREAM app would have the potential to be a scalable neurodevelopmental assessment tool for preschool-aged children administered by NSWs in low-resource settings.

411.134 Accuracy of a Novel Community Identification of Developmental Disabilities (CIDD) Tool in Ethiopian and Kenyan Settings

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Background: Children with autism and other developmental disabilities (DD) in Africa often remain unidentified and undiagnosed due to a lack of awareness and scarcity of qualified human resources. Community-based proactive case finding is a task-sharing approach whereby trusted community members undertake home visits to improve identification and help seeking. This method has been found effective in increasing identification and referral for mental health problems in low-income settings, but has not previously been used to identify children with DD. Following extensive community consultations our team developed the Community Identification of Developmental Disabilities (CIDD) tool comprising vignettes and context-appropriate images, and a training package for community support workers (CSWs) administering the tool. **Objectives:** To evaluate the accuracy of the CIDD tool in identifying children with DD.

Methods: The study was conducted in three sites: Addis Ababa in Ethiopia, informal settlements in Nairobi and rural Kilifi in Kenya. Community members with a good knowledge of the local community of children (including health workers, teachers and caregivers of children with DD) were trained as CSWs. They were advised to administer the CIDD to caregivers of children they considered at risk of delayed development and to encourage referrals. Families taking up the referral were assessed by primary health care professionals trained in assessment of DD following principles of the World Health Organization's mental health Gap Action Programme (mhGAP), followed by assessment by a clinical specialist for diagnostic verification. The positive predictive value (PPV) of the CIDD was determined against both assessments.

Results: Data from 994 CIDDs were available across all sites (mean child age 5.7 years; 61% boys, see Table 1). The majority of assessments returned a CIDD positive result (n = 971, 97%) indicating the caregiver (89% female, 58% educated at primary school level or below) recognised their child in the CIDD vignettes and shared the CSW's concerns about their child's development. Out of 971 CIDD positive cases, 908 families (94%) took up the referral for assessment by an mhGAP-trained health worker. Full diagnostic assessment data from a clinical specialist were available for 855 children. For 40% of children this was their first diagnostic assessment; in Kilifi, 64% of children had not accessed a diagnostic assessment prior to the CIDD. The PPV of the CIDD against the mhGAP assessor was 92%; the PPV of the CIDD against specialist clinical verification was 91%, indicating excellent positive predictive value. 839 children were seen by both the mhGAP trained assessor and the clinical specialist. The mhGAP assessor correctly classified the child's DD diagnostic status in 88% of cases compared to the gold standard specialist assessment (inter rater reliability = .86).

Conclusions: With focused training and using the CIDD tool, trusted and respected members of the community were able to accurately identify children at risk of DD, and to encourage help-seeking. Trained primary healthcare workers accurately diagnosed DD in most cases. In contexts with limited specialist provision, high stigma and low DD awareness, the CIDD is a promising method to improve identification of DD and encourage service engagement.

**411.135 Age-Related Differences in Clinical Profiles of Youth Seeking an ASD Assessment in a Specialized Child Psychiatric Clinic: An Exploratory Chart Review**

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Background: Clinical profiles of children seeking an ASD evaluation, particularly in relation to age, remain underexplored in the literature [1]. Autism detection age shows significant heterogeneity [2]. Although early screening is preferable, various factors may influence the timing of diagnosis, such as lower educational levels or socioeconomic status, which may account for later consultations [3]. Regarding clinical profiles, preliminary findings suggest differences in psychiatric comorbidities depending on age of assessment, with neurodevelopmental comorbidities more frequently diagnosed in younger individuals and mental health comorbidities more frequently diagnosed in teenagers [4]. These results indicate that age may serve as an indicator of distinct clinical profiles, reflecting specific challenges associated with ASD assessment across different age groups. While studies have looked at characteristics of autistic individuals diagnosed at different ages, to our knowledge, none have compared children diagnosed with ASD to those who received an alternative diagnosis [1,5]. There is, however, substantial evidence suggesting that typical signs of autism may diminish with age, which could imply that early screening is more likely to lead to an ASD diagnosis [6,7].

Objectives: The main objective of this study is to document the clinical characteristics of individuals assessed at the Autism Spectrum Disorder Evaluation Clinic, of the Rivière-des-Prairies Hospital (Montreal). We aim to compare children who receive an ASD diagnosis to those who don't and to explore how age might affect this diagnostic assessment.

Methods: Clinical data from 411 youths (male-to-female ratio of 4 : 1) were extracted. The files of 76 patients (18.49%) were closed pending, primarily because they had been evaluated at another clinic before attending their consultations. The remaining children were divided into two groups: those under 6 years old and those aged 6 to 17 years and 11 months at time of assessment. These two groups were then separated in two subgroups based on whether they received an ASD diagnosis or not. Descriptive statistics were conducted to explore differences in clinical profile between the four subgroups. (<6, ASD (n=125), <6, no-ASD (n=50), 6-17, ASD (n=42), 6-17, no-ASD (n=107)).

Results: A significantly higher proportion of children under 6 years old received an ASD diagnosis (70.22%) compared to those aged 6 to 17 years and 11 months (28%, $p < .0001$). Age appears to be a determining factor concerning the duration of assessment (care episode), with individuals over six years old tending to have longer care episodes (<6: 151.82 days vs. 6-17: 242.56 days). In terms of requests made for consultations with professionals (multidisciplinary, occupational therapy, neuropsychology, speech therapy, psychology, etc.), no clear pattern was observed among the four subgroups. However, age appears to be a determining factor for requests in neuropsychology with older patients requiring neuropsychological assessment more often ($p < .0001$) (<6, ASD: 0.80%; <6, no-ASD: 8.00%; 6-17, ASD: 33.33%; 6-17, no-ASD: 25.23%).

Conclusions: These findings underscore the critical clinical differences between preschoolers and school-aged children seeking ASD evaluation, highlighting the specific challenges of assessment at an older age. These results underscore the importance of a better understanding of the developmental trajectories of autistic characteristics.

411.136 An Analysis of the Brief Observation of Symptoms of Autism (BOSA) and the Autism Diagnostic Observation Schedule-2 (ADOS-2) in Adolescents and Adults

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Background:

There is an increasing number of adolescents and adults being referred for first time autism diagnosis, and evidence suggests that this population has a different symptom profile than adults who were diagnosed with autism in childhood (Huang et al., 2020, Fombonne et al., 2020, Jadav & Bal, 2022). While the Autism Diagnostic Observation Schedule-2 (ADOS-2) is widely-used for autism evaluations, initial validation studies primarily included adults diagnosed in childhood. The ADOS-2 is also limited in its brief nature and focus on interaction with a clinician. The Brief Observation of Symptoms of Autism (BOSA), derived from the ADOS-2, was developed in response to in-person assessment restrictions during the COVID-19 pandemic. The BOSA focuses on interaction with a familiar other and has shown promise as an adapted tool for remote diagnostic testing (Dow et al., 2022). Post-COVID, the BOSA may be useful as a supplemental diagnostic measure for first-time diagnosis of adolescents or adults, or as a brief method to re-affirm community diagnostic status in research studies. As COVID-19 restrictions have relaxed, new opportunities have emerged to explore the clinical utility of the BOSA and directly compare information gained during this brief assessment to the ADOS-2.

Objectives:

To compare BOSA and the ADOS-2 scores and classifications in a sample of adolescents and adults.

Methods:

Participants were 31 adolescents and adults referred to an autism diagnostic research study ($M_{age}=20.48$ years ($SD=6.47$); 51.6% male, 32.3% female, 16.1% gender nonconforming; 83.8% had Best Estimate Clinical Diagnoses (BECD) of Autism). Participants had scores on the BOSA F2 and the ADOS-2 Module 3 (n=8) or Module 4 (n=23) collected at the same visit. Correlations were used to explore the associations between ADOS-2 Social Affect (SA) and Restricted Repetitive Behaviors (RRB) and BOSA Social Communication and Social Interaction (SC & SI) and RRB domain scores. McNemar's test was used to explore the association between ADOS-2 and BOSA classifications.

Results:

ADOS-2 SA scores were positively correlated with BOSA SC & SI scores ($r=.65$, $p<.001$); RRB domains were also correlated ($r=.30$, $p=.049$). Sensitivity was acceptable (ADOS: 85%, BOSA: 81%) but specificity was low (n=6; 40%) on both instruments. There were few differences in instrument classifications; 80% of participants had the same classification (n=20 above; n=2 below cut-offs; $p=1.0$). The majority of participants with a BECD of Autism (65%) were above cut-offs on both the ADOS-2 and BOSA.

Conclusions:

Preliminary findings indicate that sensitivity of the ADOS-2 Modules 3 and 4 and BOSA F2 was similar and that the instruments yield highly similar instrument classifications. The BOSA may be helpful to clinicians who wish to supplement their diagnostic assessments with another observation, and a more feasible option for researchers who wish to go beyond self-report questionnaires to "confirm" community diagnostic status. Additional participants are currently being recruited to increase sample size and allow item comparisons across BOSA and ADOS-2 to better understand (in)consistencies in classifications. The strengths and limitations of using each instrument to inform diagnostic evaluations in different contexts will be discussed.



411.137 Applying Advanced AI Techniques to Identify ASD Patients' Phenotypic Subgroups in Using Partially Complete Data
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Background: ASD is a highly heterogeneous spectrum of conditions. Despite common characteristics, its presentation may vary dramatically from individual to individual. This makes it difficult for clinicians to predict what other developmental, physiological, or psychological comorbidities individuals with ASD may be at increased risk for. The relationships between ASD phenotypes are highly complex and go beyond simple linear correlation. While non-linear clustering and dimensionality reduction techniques such as Uniform Manifold Approximation and Projection (UMAP) are widely used, their power to represent extremely complex relationships between large numbers of variables is limited.

Objectives: We aim to better understand the relationships between different ASD phenotypes by leveraging advanced neural networks based techniques to discover high-level similarities between patient phenotypes. By leveraging more powerful methods we hope to help clinicians better understand what types of ASD patients are at risk of specific adverse outcomes. We aim to allow clinicians to identify a patient's phenotypic subgroup based on whatever data they may have available, even if that data is incomplete.

Methods: We used data from 359,282 individuals in the SFARI SPARK phenotype dataset, 147,469 of whom were diagnosed with ASD. The dataset contained 994 unique variables for each patient, though the information available varied significantly between patients. A Random Order AutoRegressive (ROAR) autoencoder was trained to reduce the dimensionality of the data by hierarchically encoding high-level information about each patient's phenotype into as few dimensions as possible within an embedding vector. Earlier dimensions in the hierarchy attempt to represent more important high-level information. This makes it possible to generate interpretable plots of the data by simply plotting the first two dimensions as a scatterplot.

Results: Figure 1 shows differences in how patients with similar phenotypes are grouped together in ROAR vs UMAP. ROAR embeddings are more likely to place phenotypically similar patients closer together. Figure 2 shows how closely points within the embedding space correspond to phenotype as the completeness of the data decreases. We show that the RBS-R of neighboring points is correlated at $R^2 = 0.85$ when all data is present and retains a correlation of $R^2 = 0.32$ even when repetitive behavior information is omitted.

Conclusions: We leverage advanced machine learning techniques to better understand the differences and similarities between ASD phenotypes. We demonstrate that our technique is more effective at identifying high level similarities between patient phenotypes when compared to other non-linear techniques such as UMAP.



411.138 Assessing Self-Determination in Autistic Adults: Development and Validation of the Aaspire Choices and Decisions Scale and the Self-Determination Inventory-Aaspire

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Background: Self-determination, or acting as the causal agent in one's life, is positively associated with quality of life and academic, social, and employment outcomes for autistic people (Kim, 2019). Our recent community-based participatory research (CBPR)-nested Delphi process with academic researchers and leaders from the autistic community and the health and social service systems identified self-determination as a high-priority outcome. However, panelists and team members noted accessibility concerns with existing measures and felt they may not fully capture the construct, especially in regards to whether someone is able or allowed to make their own decisions.

Objectives: To use a CBPR approach to: 1. Minorly adapt the *Self-Determination Inventory (SDI)* to increase accessibility to autistic adults. 2. Create the *AASPIRE Choices and Decisions Scale (CDS)*, measuring the extent to which a participant feels they are *able* or *allowed* to make their own choices and decisions. and 3. Evaluate the measures' psychometric properties.

Methods: Our team of academic and community partners collaboratively created direct and caregiver report versions of both instruments. We then conducted cognitive interviews with 37 autistic adults and caregivers, iteratively adapting instruments until participants felt they were accessible and captured the desired constructs. We analyzed data from 839 autistic participants, including 587 direct-reports (DR), 188 direct-reports with support (DR-S), and 64 caregiver-reports (CR). We performed exploratory factor analysis (EFA) on half the data from the *AASPIRE CDS* (stratified by report type) to identify factor structures, followed by confirmatory factor analysis (CFA) on the other half to confirm model fit. We used CFA to compare one-factor and three-factor models for *SDI-AASPIRE* and confirm model fit. We examined measurement invariance across report types, support needs, presence of intellectual disability, speech levels, and communication fluency, gender, race, and sexuality. After achieving measurement invariance, we used Wald tests to examine group differences in latent means and assessed internal consistencies.

Results: For the *CDS*, EFA identified a two-factor structure assessing Major life decisions (6-items) and Daily choices (7-items), confirmed by CFA (RMSEA=0.075, CFI=0.951, TLI=0.931, SRMR=0.037). Factor correlations in the three-factor model of *SDI-AASPIRE* were high (0.92–1.00), but the *SDI-AASPIRE* showed strong model fit with a one-factor structure (RMSEA=0.054, CFI=0.952, TLI=0.938, and SRMR=0.037). Both instruments achieved configural, metric, and scalar invariance across all characteristics, except report type. When examining model fit for the *CDS* and *SDI* separately by report type, DR and DR-S showed acceptable fits, but CR did not meet pre-specified criteria. After eliminating CR, configural, metric, and scalar invariance were achieved for report type for both instruments (Table 1). Latent mean differences showed participants who required support to complete the survey, those with less communication fluency and speech or with intellectual disability, had lower latent means in *AASPIRE CDS* and *SDI-AASPIRE* (Table 2). Both instruments demonstrated excellent internal consistency (alpha and omega > 0.90).

Conclusions: The *AASPIRE CSD* and *SDI-AASPIRE* are valid, reliable tools for assessing self-determination in autistic adults. Further research with a larger sample of CR is needed to understand discrepancies among DR, DR-S, and CR.



411.139 Assessing Utility of the SCQ for Autism Screening in Adolescents

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Background: Identifying and diagnosing Autism Spectrum Disorder (ASD) in adolescence can be challenging, as core features of ASD may be more subtle. Autistic teens may present with compensatory or masking behaviors, have higher cognitive functioning, or have had their symptoms misattributed to co-occurring conditions such as anxiety or depression (Duvall et al., 2022; Maenner et al., 2023; Mandy et al., 2018; Posserud et al., 2021). In this population, screening tools such as the Social Communication Questionnaire (SCQ; Rutter et al., 2003) are critical in determining the need for referral for comprehensive diagnostic assessment. Though previous research has shown that predictive utility of the SCQ may vary based on factors such as age and sex/gender for younger children (Evans et al., 2019), there is a need to explore how these factors may influence the utility of the SCQ in adolescents.

Objectives: The present study aims to evaluate the utility of the SCQ in predicting ASD diagnosis in adolescents, particularly whether it is moderated by factors such as sex assigned at birth (SAB) and cognitive functioning (IQ).

Methods: ROC curve analyses were employed to determine how well the SCQ differentiated between ASD and non-ASD groups. Univariate ANOVA analyses examined the impact of sex, gender, and cognitive on SCQ scores.

Results: Adolescent participants (N = 125, 50.4% male) aged 12-18 completed a comprehensive neurodevelopmental evaluation at an academic medical center. SCQ – Lifetime data was available for all participants, and full-scale IQ scores from standardized cognitive assessments (e.g., WISC-V) were available from a subsample of the larger group (N = 53). See Table 1 for demographics and descriptives.

ROC curve analysis indicated that the SCQ demonstrated poor overall predictive utility (AUC = .597) for distinguishing between adolescents with and without an ASD diagnosis in the full sample. A t-test indicated a near-significant difference ($p = .059$), with higher SCQ scores for individuals with an ASD diagnosis ($M = 18.08$) compared to individuals without an ASD diagnosis ($M = 15.71$).

When examined separately by SAB, the SCQ performed marginally better for AFAB individuals (AUC = 0.620) compared to AMAB individuals (AUC = 0.558), with AUC values indicating acceptable to poor discrimination, respectively. Similarly, univariate ANOVA revealed no significant differences in SCQ scores based on SAB ($F(1, 120) = 0.329, p = .567$) and logistic regression analysis further revealed that neither gender ($p = .542$) nor IQ ($p = .396$) significantly moderated the relationship between SCQ total score and ASD diagnosis.

Conclusions: The SCQ demonstrated limited predictive utility in identifying ASD in adolescents, with analyses indicating poor to marginally acceptable discrimination. Though adolescents with ASD tended to score slightly higher on the SCQ compared to those without ASD, the overlap in scores raises concerns about the effectiveness of existing cut-off scores in distinguishing between groups. These results suggest that the SCQ may not fully capture the symptom presentation of ASD in adolescents. Further research is necessary to explore whether adjusting the SCQ cutoff or the questions themselves might improve screening for this population.

**411.140** Associations between Demographic Characteristics and ADOS-2 Comparison Scores in a Large, Diverse Sample of Children and Adolescents

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Background: Research indicates that the validity of commonly used autism diagnostic assessment instruments can vary as a function of child characteristics (e.g., biological sex, cognitive ability). However, much of the work in this area has been limited by small-to-moderate samples that do not fully reflect the increasingly heterogeneous ASD diagnostic referral landscape.

Objectives: Leveraging assessments of >9,000 children and adolescents representing diversity in geography, race, SES, cognitive ability, and co-occurring diagnoses, the present study investigates associations between child characteristics and autism symptoms, as measured by calibrated severity scores (CSS), for Modules Toddler(T)-3 of the ADOS-2.

Methods: Data from eight academic medical centers were aggregated and harmonized across ADOS-2 Modules T-3 (see Table 1). Hierarchical linear models were run for each Module to examine relationships between nonverbal abilities, demographic variables and ADOS-2 CSS, with site modeled as a random effect. Diagnosis, sex, age, race, ethnicity, and caregiver educational level were included as explanatory variables for all Modules. For Modules T and 1, nonverbal mental age was included as an explanatory variable, and for Modules 2 and 3, nonverbal IQ standard score was included. ADOS-2 CSS was the outcome variable for all analyses.

Results: See Table 2 for results from regression models. For Modules 1-3 there were significant main effects of autism diagnosis on ADOS-2 CSS. For the toddler Module, the effect of diagnosis on CSS was dependent on age such that older age was associated with higher CSS in the autism group. For Modules T, 2, and 3, there were significant main effects of nonverbal cognitive ability on CSS: higher nonverbal ability was associated with lower CSS. For Modules 2 and 3, male sex was associated with higher CSS. For Module 3, age was negatively associated with CSS.

Additionally, Modules 2 and 3 showed effects of race such that Black/AA participants showed lower CSS (Module 2) and Asian participants showed higher CSS (Module 3), relative to white participants.

Conclusions: Although ADOS-2 CSS have been found to be less influenced by child-level characteristics than raw scores, these scores are still not immune to the effects of developmental or demographic variables. Consistent with previous analyses of autism symptom measures, we observed negative associations between nonverbal cognitive ability and CSS. Age showed less consistent relationships with CSS: for Modules T-2, age was not associated with CSS, whereas older age was associated with lower CSS for Module 3. This negative association between age and CSS on Module 3 likely reflects that verbally fluent individuals with autism show symptom reductions with age. It may also reflect ascertainment bias such that individuals referred for autism diagnostic assessment at later ages typically have milder autism symptom profiles. We also observed effects of race and sex for Modules 2 and 3: African American children showed lower CSS (Module 2) and Asian children showed higher CSS (Module 3). Males showed higher CSS on these Modules. Planned analyses will examine whether observed associations between cognitive and demographic factors and CSS are explained by measurement noninvariance at the ADOS-2 item level.



411.141 Autism, Intelligence, Language, and Adaptive Behavior, Disentangling a Complex Relationship

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Background: Autism Spectrum Disorder (ASD) is a complex neurodevelopmental disorder characterized by a range of intellectual and language abilities. Its heterogeneity is acknowledged in modern diagnostics, complicating research and necessitating precision medicine and a multidimensional approach for individualized treatment and accurate assessment. Intellectual and language functioning influence adaptive skills and symptomatology. Thus, assessing adaptive functioning in a multidimensional and multi-informant manner is crucial, highlighting the importance of comprehensive evaluations. This study explores the interplay between autistic traits, demographic variables, IQ, adaptive functioning, and the applicability of ICD-11 classifications.

Objectives: This study aims to examine the relationships between autistic traits. Demographic factors, IQ, adaptive functioning, and the applicability of ICD-11 classifications. It assesses how well these diagnostic criteria align with intellectual and language abilities in ASD

Methods: We analyzed data from the initial global evaluation of 60 diverse autistic children (aged 35 to 120 months; IQ range 16 to 118). Parent-reports using the Vineland Adaptive Behavior Scale (VABS-II) were compared with standardized assessments from the Psychoeducational Profile (PEP-3). Children's intellectual levels were assessed using Griffiths Scales of Child Development (Griffiths III) and the Autism Diagnostic Observation Schedule (ADOS-2) was used for autistic traits. They were further classified according to the ICD-11 diagnostic system, functional language, and intellectual functioning levels. Correlations among variables, group comparisons, and multivariate analyses were performed.

Results: The analysis indicates a linear effect of IQ on all adaptive scales and the impact of autistic traits on directly measured adaptive functioning. A factorial effect was observed due to changes concerning specific age, intellectual, and linguistic levels, which do not completely align with ICD-11 categorization. Additionally, a negative correlation between intelligence and measured autistic traits was found. Parental age, education level, and age at childbirth were also found to affect various adaptive scales.

Conclusions: The study questions the ICD-11's proposed distinctions in IQ and language functioning for ASD, advocating for more refined categorization and developmental considerations. It underscores the intricate relationship between autistic traits, IQ, and communication skills, casting doubt on the precision of diagnostic tools across the spectrum. Parental reports and direct assessments are essential for comprehensive evaluation, with parental education and age influencing children's behaviors and skills. The study calls for a nuanced approach to ASD assessment, integrating various metrics and sources of information for a detailed phenotyping necessary for personalized interventions and biological research.



411.142 Autism-Specific Training Is Associated with Primary Care Clinicians' (PCCs) Confidence in Diagnosing Autism

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Background:

Traditional autism diagnostic evaluations have lengthy waitlists and delay access to autism-specific supports (Wieckowski et al., 2022). The American Academy of Pediatrics has recommended that general pediatricians can make an initial diagnosis of autism (Hyman et al., 2020). Research has shown high concordance between general pediatricians' and multidisciplinary teams' autism diagnoses when pediatricians have confidence in their diagnosis (Penner et al., 2023). Primary care clinicians (PCCs) – including physicians, nurse practitioners, and others – have the potential to decrease delays in accessing to autism-specific intervention services by promptly diagnosing autism in their patients (Hyman et al., 2020; Zwaigenbaum et al., 2015). However, there is limited knowledge on the factors impacting PCCs' confidence in diagnosing autism.

Objectives:

This study aimed to 1) characterize confidence in diagnosing autism, specialty training (e.g., fellowship), autism-specific training, and PCC characteristics in an exploratory sample of PCCs, and 2) examine which clinician characteristics are associated with PCCs' confidence in diagnosing autism.

Methods:

PCCs (N=135) completed the Primary Care Beliefs and Practices Questionnaire (PCBP; adapted from Sices et al., 2003). PCCs reported their demographics, responded to "I feel confident to make a diagnosis of autism in some of my patients" and "I have been trained to diagnose autism in some of my patients" on a Likert scale from 1-5, strongly disagree to strongly agree, and "Did you complete any specialty or fellowship training?" with yes/no. The sample was characterized using descriptive statistics for PCCs' age, role, years in practice, sex, race, ethnicity, specialty training, autism training, and confidence in diagnosing autism. Confidence in making an autism diagnosis was dichotomized for analysis (no = "strongly disagree", "disagree" and "neutral", yes = "agree" and "strongly agree"). Logistic regression using a single model was used to characterize which clinician characteristics (autism training, years in practice, age, gender, race) were associated with PCCs' confidence in diagnosing autism.

Results:

Participants were majority White (67.2%), non-Hispanic (86.7%), female (69.2%), pediatricians (89.3%), with a mean age of 44.68 (SD=12.05) years, and mean of 15.04 (SD=12.55) years in practice. Most participants did not receive fellowship/specialty training (89.2%), whereas 54% received training to diagnose autism in some patients. Being trained to diagnose autism in some patients was significantly associated with higher odds of being confident in diagnosing autism in some patients, OR = 3.64, 95% CI = 2.04 – 6.49, $p < .001$. Years in practice, age, gender, and race were not associated with PCC's confidence in diagnosing autism.

Conclusions:

PCCs such as pediatricians are more likely to accurately diagnose autism when they feel confident (Penner et al., 2023). Consistent with our hypotheses, having training in diagnosing autism was associated with PCC's confidence in diagnosing autism. This supports the importance of providing autism-specific training to PCCs early in their careers to enhance confidence and potentially increase earlier access to diagnostic evaluation and more rapid access to autism-specific interventions. Future research should explore the nuances of PCCs' confidence in both diagnosing and excluding autism, and examine how this confidence translates into clinical practice.

411.143 Barriers to Developmental Intervention for Urban Minority Families: A Replication in Atlanta

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Background: Numerous studies highlight significant racial disparities in developmental outcomes of U.S. children affected by autism spectrum disorder (ASD). Recently, in 3 successive reports from the Autism and Developmental Disabilities Monitoring (ADDM) program of the US Centers for Disease Control and Prevention (CDC) (birth cohort years 2014, 2016, and 2018), we and our collaborators reported that although the prevalence of community-diagnosed ASD had equalized for Black and non-Hispanic White (NHW) children in the United States, there has persisted a pronounced racial disparity in the proportion of ASD-affected children with comorbid intellectual disability (ID), on the order of 50% for Black children with ASD vs 20% for White children with ASD. We subsequently documented in a large case series in St. Louis, Missouri that timely diagnosis for Black children, despite establishing service eligibility for developmental therapy, did not resolve major racial disparities in access to such intervention until supplemental services that supported access and participation of families was established. Data from the current sample replicate and extend findings to a group of children within the Metro Atlanta area.

Objectives: N/A

Methods: We provided diagnostic assessments to 66 children suspected of ASD or related conditions under age 3 years in Atlanta, Georgia. In our sample, 92% of the children identify as Black with an additional 5% identifying as Black in addition to other ethnicities. Referrals originated from the children's primary care providers, typically following a moderate- or high-risk MCHAT-R screening as part of their well child check. Ninety-two percent were governmentally insured under GA Medicaid or by a contracted care management organization (CMO). Sixty-five met diagnostic criteria for ASD (mean age of diagnosis 2 years, 5 months) and were judiciously case-managed to acquire community-based developmental therapy services.

Results: Ten children were enrolled in early intervention services, including Part C, through a local agency prior to their third birthdays. The remainder experienced significant challenges in accessing developmental therapies. Critical barriers included: (1) lengthy processes for intervention enrollment following diagnosis, many of which persisted past the time when the children aged out of Part C; (2) transportation barriers for center-based developmental intervention options; (3) non-eligibility for specific resource streams funding the developmental interventions.

Conclusions: This case series constitutes a replication of prior observations of severe barriers in access to developmental intervention for families of young Black children affected by autism. Scientific documentation of the disparity in access to intervention--and correlated disparity in cognitive and adaptive function--have not yet translated into systematic efforts to ensure that early-diagnosed children are receiving interventions that have shown promise in resolving this serious enduring disparity in outcome. By the time of the 2025 INSAR meeting, additional data on intervention access and cognitive outcomes of the early-diagnosed children will be presented and discussed with respect to implications for health policy.

411.144 Can Caregivers of Toddlers with Autism Characteristics Administer in-Home Assessments to Fidelity When Coached By Remote Assessors?

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Background: There has been a recent surge in the development and implementation of virtual assessment tools for toddlers with suspected autism (Berger et al., 2022). While most virtual assessments studied have been diagnostic tools, research suggests that observational assessments of skills such as motor imitation and social communication may be well suited to assess progress in early intervention (MacDonald et al., 2014). We developed a virtual adaptation of such an assessment tool for use in a clinical trial, with assessors with a range of training backgrounds (i.e., bachelor's to doctoral level) achieving high fidelity to the protocol (RISE CPP; Tagavi et al., 2024). While prior work suggests that caregivers find virtual autism assessment tools to be generally acceptable (Corona et al., 2021), little is known about the fidelity of caregivers in administering virtual assessments.

Objectives: This study aims to answer three questions: (1) Do caregivers (coached by remote assessors) administer a virtual assessment to fidelity across different types of tasks? (2) Is caregiver fidelity associated with their assessor-coach's fidelity? (3) Does caregiver fidelity vary across demographic characteristics or parenting stress and self-efficacy?

Methods: The RISE CPP (Tagavi et al., 2024) was administered to toddlers with social communication delays ($n=53$, 19 girls, 16-34 months) at three time-points in an ongoing multi-site clinical trial evaluating birth-to-three services for autism. Using telehealth, caregivers were coached on administering tasks to elicit toddler's social communication and imitation skills. Trained assessor-coaches ($n=18$) achieved fidelity ($>80\%$) on at least three supervised CPPs before coaching families independently. Twenty percent of each assessor-coach's CPPs were randomly selected, such that only one assessment per family is included in analyses. Research assistants coded caregiver fidelity on a 0-2 scale for each task, with higher values representing higher fidelity. Caregivers completed a demographic survey at enrollment and the Parenting Stress Index (Abidin, 1990) and the Parenting Efficacy Scale (Teti & Gelfand, 1991) at each assessment.

Results: Table 1 displays child and caregiver demographic characteristics. Non-parametric statistics (Kendall's tau; Friedman's and Kruskal-Wallis ANOVAs) were used due to significant skew. Assessor-coach fidelity (Mean = 96.05; Range = 83.1-100) and caregiver fidelity were high (Mean = 94.6; Range = 70.3-100), with a significant correlation between assessor-coach and caregiver fidelity ($\tau = 0.275$; $p < 0.01$). Caregivers demonstrated high fidelity across tasks with no differences on tasks eliciting imitation or communication ($\chi^2(1) = 1.96$; $p = 0.162$; see Figure 1). Caregiver fidelity was not associated with parenting stress, parenting self-efficacy, or child/caregiver age (τ s = -0.121 to 0.120; $ps > 0.25$), nor did it vary by child sex or child/caregiver race or ethnicity ($ps > 0.30$).

Conclusions: Caregivers from diverse backgrounds effectively administered a virtual assessment tool when coached by assessors with a range of training backgrounds, with high fidelity across both communication and imitation tasks. Neither concurrent parenting stress nor parenting self-efficacy were associated with caregiver fidelity. Findings show promise for further development and validation of flexible, virtual assessment options, with potential for increasing capacity for measuring intervention progress for toddlers with suspected autism.

**411.145** Can Expert Clinicians 'Hear' the Autism Diagnosis at a Vocal and Preverbal Stage? a First Impression Study

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Background: Clinicians frequently report being able to rapidly detect autism just from hearing an autistic individual's vocal production, even before direct interaction. While prior research indicates that vocal characteristics can influence diagnostic judgments, it remains unclear how accurate such spontaneous diagnostic judgments may be and which characteristics of vocalization drive them.

Objectives: This study aimed to determine whether expert clinicians can accurately differentiate the vocalizations of young autistic children from those of non-autistic peers above chance levels, and to evaluate the effectiveness of canonical babbling stimuli compared to vocalic productions in facilitating this differentiation. We hypothesized that expert clinicians would: (1) differentiate above chance level the vocalizations of young autistic children from those of young non-autistic children, and (2) perform better with canonical babbling stimuli (containing at least one vowel and one consonant) than with vocalic productions (containing only vowels).

Methods: Sixty-one French-speaking expert clinicians in autism categorized a total of two hundred and twenty 1.5- to 2-second-long vocal samples from 9- and 18-month-old children from three distinct groups (infants at elevated likelihood for autism who received a diagnosis (ELA+) vs. those who did not (ELA-) vs. those at low likelihood for autism (LLA)) into "autistic" or "non-autistic" categories. Vocalizations were randomly presented and included early both preverbal productions, vocalic and canonical babbling production. Stimuli came from naturalistic 6-hour home recordings.

Results: Results showed that discriminability calculated with d-prime (d') for 9-month-old stimuli was .08, indicating near-chance detection. For 18-month-olds, d' increased to .23, reflecting moderate ability to differentiate autistic from non-autistic vocalizations. Accuracy was notably improved for 18-month-old stimuli (see Fig.1 Detection of autism diagnosis from vocalizations at 9 and 18 months; Hits, False alarms and Sensitivity). At 9 months, responses for canonical babbling stimuli in the ELA+ group were significantly lower than in the ELA- and LLA groups ($p < .0001$), with correct responses being above chance only for vocalic productions and not for canonical babbling in the ELA+ group. The opposite trend was observed for the ELA- and LLA groups. At 18 months, correct responses for ELA+ canonical babbling remained significantly lower than for ELA- and LLA groups ($p < .0001$), while vocalic productions were identified similarly across all groups (see Fig.2 Interaction between Production type and Diagnostic group at 18 months and chance level).

Conclusions: These findings suggest that detecting autistic traits from infant vocalizations is challenging, despite relative improvement over time. The fact that respondents were more accurate in identifying vocalic productions in autistic children (ELA+), but not in canonical babbling, with the opposite findings in non-autistic groups (ELA- and LLA), suggests that clinicians' relied on articulatory maturity rather than on autism-specific vocal patterns to make a decision. Overall, these results highlight the potential and limitations of using brief vocal samples for early ASD detection. However, further research on initial perceptions of maturity in early production appears promising for the early detection of language development delays.



411.146 Capturing Perspectives Regarding the Diagnostic Odyssey from Caregivers in SPARK Using the Events History Calendar Questionnaire

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Background: Research has shown that obtaining an autism spectrum disorder (ASD) diagnosis often involves significant delays. Constantino et al. (2020) investigated the timing of diagnosis and the factors contributing to diagnosis delays in African American youth using the Events History Calendar Interview (EHCI). The EHCI enables caregivers to detail their diagnostic journey and identify diagnostic barriers. While ASD diagnosis rates have become more equitable across racial groups, significant ASD diagnosis delays and disparities in intellectual disability diagnosis rates persist. Our study examines data from a larger project adapting the EHCI into an electronic questionnaire to allow for broader dissemination, utilizing the reach of the SPARK study to collect caregivers' perspectives on a national level.

Objectives: This study examined caregivers' perspectives on their autism diagnostic journey, aiming to better understand areas of improvement for diagnostic and functional outcomes.

Methods: Participants included 985 children (ages 4 to 14; 76% Male; 66% White) and their caregivers (ages 22-81) from 4 racial groups (White, Black/African American, Asian, Multiracial) who participated in the SPARK study. Caregivers electronically completed the EHCI questionnaire. Building on Constantino et al. (2020), we used the adapted EHCI questionnaire to analyze responses across and within racial groups. Bivariate correlations were calculated within each racial group to assess relationships among age at parental first concerns, age at diagnosis, age at service initiation, family income at first concerns, and diagnostic stage, (time between diagnosis and EHCI completion).

Results: Diagnosis delay, defined as the time from initial concern to official diagnosis, was longest for White respondents (Mean=28.4, SD=25.3 months) and shortest for Black (Mean=18.1, SD=28.2 months) and Asian (Mean=18.1, SD=21.9 months) respondents. Diagnostic stage calculations (age in months at survey completion – age in months at diagnosis) showed similar gaps by race, with the shortest gap for Multiracial (Mean=58.7, SD=15.1 months) and the longest for Asian (Mean=59.2, SD=10.2 months) respondents. All racial groups reported significant professional wait times and evaluation unavailability as major barriers to receiving a diagnosis (59.5% and 41.7%, respectively). The number of professional visits was similar across groups, with 26.9% reporting 3-5 visits and 19.6% reporting at least 6 visits. Bivariate correlation results with noted significance can be found in Tables 1 and 2. Notably, there were moderate positive correlations across all races between age of first concern and age at diagnosis (White, $r=0.46$, $p<0.001$; Black, $r=0.27$, $p<0.001$; Asian, $r=0.51$, $p<0.001$; Multiracial, $r=0.34$, $p<0.001$). There were also weak negative correlations between age at service initiation and income at first concern in White and Multiracial families ($r=-0.12$, $p<0.001$; $r=-0.17$, $p<0.001$, respectively).

Conclusions: Our findings suggest that racial category may no longer be the sole contributing factor in diagnosis delays or service initiation. Across all races, participants noted significant diagnosis (age 4) delays from their initial developmental concerns (age 2). Attention to other parent-report factors that could be impacting delays should be explored, including: symptom severity, socio-economic status, and intellectual disability diagnosis. By the time of the meeting, these additional factors will be presented and discussed, particularly at the regional level.



411.147 Caregiver-Identified Strengths in Children Attending Their First Neurodevelopmental Assessment: Development of the Child Autism and Neurodevelopment Strengths Checklist

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Background: There has been a growing focus on the importance of understanding strengths in children with neurodevelopmental conditions and how such knowledge can be used to support clinical practices. There has, however, been limited research exploring systematic reports of strengths from caregivers of children with neurodevelopmental conditions, most commonly autism, at the time of their first diagnostic assessment. As a result, there are no frameworks guiding how caregiver-identified strengths can be integrated into the assessment process to inform feedback sessions and personalise intervention and support strategies following a diagnosis.

Objectives: The aim of this study was to understand caregiver-identified strengths for children attending a child neurodevelopment assessment service, with the most frequent assessment being for autism. We then present a child autism and neurodevelopment strengths checklist based on these strengths, and discuss the utility of this checklist for clinical services.

Methods: Participants were caregivers of 686 children aged 1.17 – 17.58 years ($M=6.50$, $SD=3.56$, 70% male), attending a tertiary-level assessment service. Overall, 75% of children received a diagnosis of autism. Caregivers completed an intake survey prior to their child's diagnostic assessment. Free text responses to the question "What do you think are your child's strongest points (what does he or she do best)?" were used to assess strengths. Free text responses were analysed using qualitative content analysis to generate codes, categories and themes.

Results: Content analysis identified 61 unique strengths, which were categorised into six meta-themes: cognitive and intellectual (identified in 45% of children), social and interpersonal (identified in 41% of children), hobbies and passions (identified in 38% of children), character and personality (identified in 34% of children), physical (identified in 27% of children), and behavioural (identified in 20% of children). The most frequently reported specific strengths across children were 'kind caring, and compassionate', 'social and friendly', 'loving and affectionate', 'music, singing and dancing', and 'good memory recall'. We also discuss similarities and differences in strengths profiles between children who received a diagnosis of autism and those who did not. Following content analysis, identified themes and specific strengths were collated into a checklist (The Child Autism and Neurodevelopment Strengths Checklist) that can be completed by caregivers at the time of diagnostic assessment.

Conclusions: This is the first study to examine caregiver-identified strengths in children with neurodevelopmental concerns, principally autism, at the time of their first diagnostic assessment. The depth and breadth of strengths identified challenges multiple stereotypes about the characteristics of children with NDCs and provides a framework for how a strengths-based approach may be incorporated in diagnostic assessments and reports.

To support clinical services in implementing a strengths-based approach from a child's first diagnostic assessment, we present a checklist, The Child Autism and Neurodevelopment Strengths Checklist, which can be completed by caregivers and integrated by clinicians into assessment feedback and recommendations. We then discuss what is required to use this knowledge to inform strengths-based practices that can support clinical practice and inform on child health and development and family well-being.

411.148 Caregivers' Reports of Emotion Regulation in Autistic Toddlers with and without Language Delay

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Background: Autistic toddlers show early differences in both their ability to regulate emotions and in language development (Kwok et al., 2015; Cibralic et al., 2019). Greater language ability relates to better emotion regulation in neurotypical and autistic populations (Cohen & Mendez, 2009; Cibralic et al., 2023). Meltdowns, one facet of emotion regulation, are a concern for caregivers of autistic toddlers (Maskey et al., 2012; Silva & Schalock 2011). Meltdowns are characterized by intense responses (e.g., aggression, self-injury) to various stressors (Mazefsky et al., 2013). Lower language and IQ are proposed markers for more intense meltdown behaviors in autistic individuals (Williams et al., 2018). Some research supports this suggestion, showing differences in the presentation of externalizing behaviors associated with meltdowns for children with lower cognitive ability; however, the direction of this relationship varied (Gohari et al., 2024; Mazurek et al., 2013). Other research reports no differences in the intensity and frequency of these behaviors for autistic children (Lorang et al., 2021; Maddox et al., 2018).

Objectives: To examine whether language ability is related to differences in the intensity and frequency of responses to stressors in a sample of 2- to 5-year-old autistic toddlers.

Methods: Twenty-eight caregivers completed a 15-minute Meltdown Qualitative Interview (MQI) regarding their toddler's meltdown behaviors. Behavior frequency scores were assigned based on caregivers' reports of injurious and aggressive behaviors (e.g., self-injury, hitting/kicking, etc.). Caregivers completed the BRIEF-P and EDI-YC, measures of toddlers' reaction intensity and frequency when dealing with stressors.

Developmental quotients for overall verbal ability were created using the average of preschoolers' expressive and receptive language age equivalents on the Mullen or DAS-II. Toddlers were dichotomized into a Language Delay (LD) or No Delay (ND) group based on the average amount of domain-specific developmental delay required to receive federally-funded early intervention ($SS \leq 70.43$; Edmunds et al., 2023).

Results: When examined as a continuous variable, language scores were not significantly correlated with BRIEF-P Emotional Control scores ($r=0.35$, $p=0.1$); however, language was significantly positively correlated with EDI-YC Reactivity ($r=0.45$, $p=0.02$) (Figure 1). When examined dichotomously, a two-sample t-test found no differences in BRIEF-P Emotional Control between the ND and LD groups, $t(19.89)=-1.27$; $p=0.22$; however, for EDI-YC Reactivity, the ND group ($M=61.95$, $SD=11.16$) scored significantly higher than the LD group ($M=53.52$, $SD=9.11$), $t(25.00)=-2.19$; $p=0.04$. In the preliminary examination of the qualitative data, no differences in the variety of aggressive behaviors were found between groups, and frequency of these behaviors were not correlated with language ability ($ps > .05$). Further qualitative analysis will occur prior to April 2025 to provide a more rigorous assessment of potential differences in meltdown topography and intensity based on language abilities.

Conclusions: Greater language predicted more intense reactivity in autistic toddlers, conflicting with previous literature on language and emotion regulation. For some autistic toddlers, verbal learning may be encouraged when experiencing more dysregulation. No differences in meltdown frequency and variety may indicate a more nuanced picture of emotion regulation, where autistic toddlers have varied regulatory abilities, but similar reactions upon encountering stressors.



411.149 Psychometric Evaluation of the Brief Autism Symptom Criteria Interview (BASCI)

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Background: Online diagnostic evaluations for Autism Spectrum Disorder (ASD) increased in prominence during the COVID-19 pandemic and have continued as a mechanism for improving diagnostic delays for children at increased likelihood of receiving a diagnosis. It is crucial to ensure that tools used in online evaluations have strong psychometric properties. The Brief Autism Symptom Criteria Interview (BASCI) was developed for use in a set of nationwide online diagnostic clinics as a parent interview to aide clinicians in the collection of autism symptom information.

Objectives: The primary aim was of the present study was to evaluate the reliability and construct validity of the BASCI across a large demographically- and geographically-diverse clinical sample of children between 15 months to 10 years old who completed an online diagnostic evaluation.

Methods: Data were obtained from 08/2022 to 10/2023 and included 2543 children ages 15 months to 10 years old participating in a set of nationwide online autism evaluation clinics. The measure is a 31-item dichotomously scored instrument and was completed by the attending pediatrician ($k=29$) during the initial visit. Additional measures collected included: The Modified Checklist for Autism in Toddlers-Revised (M-CHAT-R); the Autism Symptom Dimensions Questionnaire (ASDQ); the Tele-ASD Peds (TAP); and the Childhood Autism Rating Scale, 2nd Edition, based on patient observation (CARS-2 obs). Completion time, factor structure, scale and conditional reliability, convergent validity, and diagnostic efficiency of the BASCI was evaluated.

Results: Sample characteristics were consistent with a childhood autism evaluation clinic (Median Age=50 months, 68% male, 66% ASD diagnosed) and were highly diverse (21% Hispanic, 30% Black or African American, 52% public insurance) with children from 39 US States. BASCI completion time was variable but almost always less than 50 minutes (Median=29.8 minutes, 25%ile=24.8, 75%ile=35.6). A two-factor bifactor solution fit the data well (RMSEA=.036, CFI=.941, TLI=.931), with a general ASD factor and social communication/interaction and restricted/repetitive behavior specific factors (Figure 1). Scale reliability was very good for the total and social communication scales ($\alpha=.84$ and $.81$ respectively) and adequate for the restricted/repetitive behavior scale ($\alpha=.70$). Conditional reliability was adequate or better for the total score in the range of the latent trait important for diagnostic differentiation. Convergent validity with other autism symptom measures was moderate to high ($r=.37$ to $.46$; Figure 2), consistent with expectations for a same-construct, different information source correlations. In this clinically challenging (already screened) sample, diagnostic efficiency was fair to good (AUC=.690, 95% CI=.67-.71).

Conclusions: The present results indicate that the BASCI is a brief, easily completed measure with a readily interpretable factor structure, broadly consistent with DSM-5 criteria, as well as good scale and conditional reliability, particularly given the instrument's primary purpose as a diagnostic aide. Convergent validity evidence was good and diagnostic efficiency was adequate but below what would be desired to provide incremental validity to other observational instruments. Additional research is needed to evaluate construct validity and diagnostic efficiency. Future revisions of the instrument should consider using ordinal scaling to further enhance reliability and validity.



411.150 Clinician Impact on the Identification and Diagnosis of Female Autistic Youth: A Scoping Review

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Background: Autistic girls and women are more likely than autistic males to be identified late, misdiagnosed, or not recognized at all. Thus far, most investigations into this phenomenon have focused on characterizing sex-based differences in autism presentation, demonstrating that under-recognition of autistic females is a real problem, or, most recently, describing the landscape of processes and systemic factors that predict under-diagnosis or misdiagnosis in this subgroup. However, little is known about clinicians' specific roles and impacts within these systems. The goal of this scoping review is to lay the foundation for future medical education interventions that target clinician knowledge and competence, to improve their ability to identify autism in individuals assigned female at birth.

Objectives: To synthesize current knowledge about the impact of clinician-level factors on the recognition and diagnosis of female autistic youth.

Methods: The authors searched four electronic bibliographic databases (PubMed/MEDLINE, Embase, PsycINFO, and CINAHL) for relevant literature with the help of a research librarian. To be included, articles must: (1) directly or indirectly assess the role of the clinician (2) as it relates to the identification, referral, or diagnosis of autism (3) in female children or adolescents. After compiling the final corpus, we used a thematic analysis framework to produce our preliminary findings. To complete the review, we will continue to iteratively refine our analyses and solicit feedback from interested parties to inform our conclusions.

Results: Of 336 unique articles screened for inclusion, 61 papers published before our search (July 23, 2024) were deemed eligible and included in the review. The selection process is shown in a PRISMA flow diagram (Fig. 1). Our overarching results thus far suggest that inadequate knowledge about female-typical, socially motivated, and camouflaged presentations of autism prevents both specialists and non-specialists from effectively identifying, referring, and diagnosing female autistic youth. The impact of this knowledge gap is magnified by poor awareness that the issue exists; in other words, many clinicians are confidently making uninformed assessments because they "don't know what they don't know." In addition, multiple clinician-level cognitive biases can impede the path to diagnosis, including bias toward observation over patient/caregiver report, diagnostic overshadowing, expectancy bias, and implicit and/or explicit gender bias related to autism.

Conclusions: This scoping review highlights the critical impacts of clinician bias and unfamiliarity with non-classic presentations of autism on the identification and diagnosis of female autistic youth. Our results provide a foundation for the development of future professional education interventions and curricula aimed at increasing knowledge and awareness about autistic girls and women, which will better equip clinicians to make early, accurate diagnoses and improve long-term outcomes.



411.151 Clinician Needs for Autism Diagnostic Training in Malaysia: Insights from a Focus Group Study

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Background:

Autism Spectrum Disorder (ASD) is a complex neurodevelopmental condition that requires precise diagnostic evaluation and early intervention. Clinicians in Malaysia play a crucial role in the assessment and diagnosis of ASD. However, there is a growing need to understand their training requirements, current practices, tools used, and strategies employed when encountering challenging cases. This study aims to explore the perspectives of specialists working across eight hospitals in Malaysia to identify the specific training needs and strategies employed in the context of ASD diagnosis.

Objectives:

To explore and describe the perspectives of specialists managing neurodevelopmental conditions in Malaysia on ASD diagnosis.
To identify specific training needs and strategies employed for diagnosis of ASD in children in Malaysia.

Methods:

A qualitative research design was employed, consisting of focus groups with a total of 20 specialists from psychology (n=4), psychiatry (n=9), and paediatrics (n=7). Participants reported having over 3 years of experience diagnosing children with ASD and related conditions. Participants were recruited from eight hospitals located in various regions of Malaysia. The focus group discussions centered on three key areas: (1) current clinical practices in ASD diagnosis, (2) the diagnostic tools utilized, and (3) strategies employed when faced with challenging or complex cases.

Results:

Thematic analysis of discussion notes revealed several common themes among the participating clinicians. First, while the use of standardized diagnostic tools is widespread, there is a desire for continuous updates and access to culturally adapted instruments for ASD diagnosis. Clinicians emphasized the importance of adapting international guidelines to the Malaysian context. Additionally, challenges in interprofessional collaboration and communication were highlighted, suggesting the need for improved interdisciplinary training. Clinicians expressed the need for advanced training programs that offer both theoretical knowledge and practical skills to enhance diagnostic accuracy and sensitivity. Furthermore, they emphasized the importance of training on cultural sensitivity and understanding the diverse population of individuals with ASD in Malaysia.

In handling challenging cases, clinicians reported using a collaborative problem-solving approach and seeking guidance from peers and interdisciplinary teams. Regular case discussions were highlighted as a valuable strategy for improving diagnostic accuracy and developing effective intervention plans.

Conclusions:

The results of this focus group study underscore the importance of addressing the specific needs of clinicians involved in the diagnosis of ASD in Malaysia. Findings suggest the necessity for specialized training programs that incorporate culturally adapted diagnostic tools, enhance interdisciplinary collaboration, and promote ongoing professional development. These insights can inform the development of targeted training initiatives to better equip clinicians in Malaysia for accurate and timely ASD diagnosis, ultimately improving outcomes for individuals with autism in the country.

411.152 Clinicians' Perspectives on the Differential Diagnosis of Autism, Attachment Difficulties and Complex Post Traumatic Stress Disorder: A Qualitative Framework Analysis

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Background: Autism, attachment difficulties and Complex PTSD (CPTSD), can present with overlapping characteristics or presentations in children. This can create challenges in differential diagnosis, particularly when conditions may co-occur. Understanding clinicians' perspectives on how they approach these complexities is essential for improving diagnostic practices.

Objectives: To explore how clinicians with expertise in autism assess and differentiate between autism, attachment and CPTSD in children, focusing on their experiences, challenges, and perspectives in the diagnostic process.

Methods: An online survey was conducted with 37 clinicians, predominantly from the UK, including clinical psychologists, psychiatrists, and speech and language therapists. Participants shared their insights on assessment practices through open-ended questions, and their responses were analysed by applying a framework analysis to the data (Gale et al., 2013). Through mapping and interpretation of the framework matrix, we were able to highlight any contrasting opinions amongst different professions.

Results: Five key themes emerged and were further divided into subthemes. The themes included: (1) Experienced Clinicians – Clinicians with more experience demonstrated greater confidence in differentiating between autism and trauma-related conditions, often relying on clinical intuition rather than assessment tools; (2) Multidisciplinary Teams – The majority of clinicians emphasised the importance of working in multidisciplinary teams to ensure holistic assessments in more complex cases; (3) Developmental History – Taking a comprehensive developmental history was identified as crucial for differential diagnosis. Challenges included reliability of informant recall or a lack of history due to the child's circumstances; (4) Assessment Tools – While tools like the ADOS were commonly used, clinicians stressed the importance of not relying solely on tools, suggesting that clinical judgment is key; (5) Systemic Challenges – Clinicians noted systemic barriers, such as resource limitations, that impact the quality of assessments.

Conclusions: Further research is needed to refine diagnostic tools, particularly for differential diagnosis of attachment difficulties and autism. Training that integrates the current silos of autism, attachment and trauma-related expertise, as well as shadowing opportunities for less experienced clinicians, is desired by clinicians. Collaborative efforts between disciplines and better integration of trauma and developmental services are essential for improving diagnostic accuracy and providing appropriate support for children with more complex presentations.

411.153 Coder Agreement of Autistic-like Behaviors in Children with Autism during Remote Academic Assessment

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Background: Accurately measuring foundational academic skills in evaluations for children with autism is crucial for fostering their academic success (Harry et al., 2022). Remote learning and assessments surged following the COVID-19 pandemic (Reicher, 2020), emphasizing the need to examine how behavioral characteristics specific to autism may affect the administration, results, and utility of remote approaches to academic evaluation (Mire et al., 2022). Traditionally, assessments of autism-related behaviors occur in-person, but relatively less is known about effective strategies and best practices for accurately capturing these behaviors in virtual settings. This presents unique challenges for educators and clinicians tasked with assessing academic skills of autistic children, as remote environments introduce new variables that may influence behavior and academic skill demonstration. Consequently, there is a need for behavioral observations during remote assessment sessions that are both valid and reliable for special populations, like children with autism.

Objectives: This study has three primary objectives. First, we categorize common behavioral observations of children with autism during remote academic assessment, creating a clearer framework for identifying and classifying these behaviors in a remote environment. Second, we identify which autistic-like behaviors contribute to variability in coder agreement when assessments are conducted in a remote setting. By understanding behaviors prone to disagreement among coders, challenges unique to virtual assessments with autistic students may be elucidated. Lastly, we explore potential contributors to discrepancies between coders, such as differences in interpreting certain behaviors or difficulties in observing subtle cues in the virtual environment.

Methods: Our sample included 10 elementary-aged students (8 boys, 2 girls) with a clinical diagnosis of autism spectrum disorder, or an autism educational classification recruited through a partnership with a public school district in a large metropolitan area in Texas. Our research team recorded and remotely administered math, reading, and writing curriculum-based measurement probes for between 1 and 5 sessions. Two research assistants coded each video to identify behaviors characteristic of autism during the assessment sessions. Following behavioral observations, we examined factors that could have influenced inter-observer agreement scores for each behavioral category. We used algorithm items from the Autism Diagnostic Observation Schedule-2 (Lord et al., 2012) Module 3 to categorize behaviors into (a) social affect (SA) and (b) restricted and repetitive behaviors (RRB).

Results: Current findings suggest factors including (a) coders' experience with autistic students, (b) coders' formal training in autism diagnostic evaluation, (c) variability in children's symptom presentation, and (d) nuances of administering assessments via the remote modality, affected coder agreement. Ongoing analyses are underway to assess the relationship between SA and RRB behaviors and interobserver agreement, providing insight into behaviors more challenging to observe and accurately identify through a remote modality may affect academic skill assessment.

Conclusions: Understanding factors that may influence the reliability and validity of remote academic assessment for children with autism will provide critical insights into improving the accuracy and consistency of assessment approaches. Ultimately, this line of work has the potential to improve academic outcomes for autistic learners.

411.154 Comparing Cognitive and Adaptive Functioning between Children Identified By a School-Based Universal Screening Program and a Clinically-Ascertained Sample

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Background: Many autistic individuals go undetected until school-age or later and do not receive a diagnosis until adulthood (Huang et al., 2020). Identification of autism spectrum disorder (ASD) before symptoms become clinically significant can lead to improved functional outcomes and quality of life (Sandbank et al., 2023). Our team recently implemented a school-based universal screening program designed to identify school-aged children with social challenges (James & Smith, 2022). Understanding potential differences in cognitive and adaptive functioning (AF) between children identified and subsequently diagnosed with ASD through the program and children who received a diagnostic evaluation outside of a screening model may shed light on the utility of school-based universal screening and inform intervention strategies.

Objectives: To compare cognitive and adaptive functioning of autistic students identified by universal screening to an age- and sex-matched sample of clinically referred children who received an ASD diagnosis outside of a screening model.

Methods: Secondary data analysis was conducted using (1) data collected from participants who were evaluated as a result of school-based universal screening and (2) archived records collected from a clinically ascertained sample of children diagnosed with ASD at our research center. Analyses focused on a sample of children and adolescents ($n = 86$, mean age 9.56 years) matched on age at evaluation and biological sex assigned at birth. Independent samples T-tests were conducted to compare scores on the Kaufman Brief Intelligence Test, Second Edition (Kaufman & Kaufman, 2006) and Vineland Adaptive Behavior Scales, Second/Third Edition (Sparrow et al., 2005, 2016).

Results: Composite IQ ($t(84)=2.67, p<.01$) and Adaptive Behavior Composite (ABC) ($t(84)=3.16, p<.01$) scores were significantly higher for students who were evaluated as part of the universal screening program compared to children in the clinically ascertained sample. The largest difference in AF domain scores was in Socialization ($t(84)=4.06, p<.001$), followed by Communication ($t(84)=2.88, p<.01$), then Daily Living Skills ($t(2.17)=5.86, p<.05$). (See Table 1.)

Conclusions: Children in both groups had composite IQs in the average range; however, adaptive behavior composites were significantly lower than IQ scores, suggesting functional impairment. Children identified through the universal screening program had significantly higher AF scores compared to clinically referred children. This may suggest that universal screening detected students before functional impairment was identified by parents or teachers and resulted in an earlier diagnosis than would have been the case if children were not identified through screening.

Identifying autism before functional impairment is observed may prompt caregivers to seek a diagnostic evaluation and enable access to evidence-based interventions and support that could facilitate improved functioning and quality of life.

Table 1. Participant Assessment Scores

Variable	Universal Screening Group <i>m</i> (<i>SD</i>) (<i>n</i> = 43)	Clinically Ascertained Group <i>m</i> (<i>SD</i>) (<i>n</i> = 43)
KBIT		
Verbal SS	106.26 (17.23)	94.02 (18.96)
Nonverbal SS	107.07 (19.10)	102.26 (19.38)
Overall IQ Composite	108.09 (18.73)	97.65 (17.55)
VABS		
Communication SS	86.93 (13.45)	77.49 (16.78)
Daily Living Skills SS	90.23 (14.42)	83.00 (16.43)
Socialization SS	81.6 (11.56)	70.21 (14.31)
Adaptive Behavior Composite SS	84.33 (11.49)	75.88 (13.20)

411.155 Comparison of Different Eye Tracking Measures for Identification of Autism in Children

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Background: Eye-tracking has emerged as a powerful tool in autism research, enabling the identification of social attention and gaze behavior differences between autistic and typically developing children. Previous studies have suggested that such gaze differences reduce the exposure of children to social information, potentially altering their development. Previous studies have mostly used region of interest (ROI) analyses to quantify the total amount of time participants gaze at specific regions. Other studies have used time-series analyses to examine temporal and spatial differences in gaze patterns. Here we compare these approaches in a large dataset of recordings from young children.

Objectives: Compare the accuracy of classification between autism and control children when analyzing the same eye-tracking data using ROI versus time-series analyses.

Methods: We analyzed 486 eye-tracking recordings, 363 from autistic children (mean age: 4.81 ± 1.63 yo) and 123 from controls (mean age: 3.21 ± 1.35 yo) collected at the Azrieli National Centre for Autism and Neurodevelopment Research (ANCAN) in Israel using an EyeLink 1000+ eye tracking system. Children viewed a 90 sec video with a naturalistic social interaction. ROIs of faces, objects, body parts, and background were manually annotated in each frame of the video. Time-series of X and Y gaze position per frame were combined into a single time-course of radial position from top left corner of the screen. Five gaze measures were evaluated: (1) Euclidean distance between the gaze time-course of each child and the mean gaze time-course of the control group (2) the average pair-wise correlation of gaze time-courses between each child and each of the control children (3) the percentage of time gazing at faces (4) the percentage of time gazing at objects (5) the ratio of faces to objects. We performed a receiver operating curve (ROC) analysis for each of the measures to determine their ability to separate autism and control children and report the area under the curve (AUC) of each.

Results: The Euclidean distance measure exhibited the strongest classification (AUC= 0.73) followed by the ratio between faces and objects (AUC=0.69), the pair-wise correlation measure (AUC= 0.67) and individual face and objects ROI measures (AUC= 0.66 and 0.64 respectively).

Conclusions: These results demonstrate that time-series analyses have an advantage over ROI analyses in identifying gaze differences between autistic and control children. They suggest that the temporal structure of visual attention differs in autism beyond overall social preferences and point to additional



411.156 Concordance between Direct Observation (TELE-ASD-PEDS) and Caregiver Report (TASI) during Telehealth Visits
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Background:

Telehealth approaches to autism assessment burgeoned during COVID-19 (Zwaigenbaum et al., 2021). The TELE-ASD-PEDS (TAP; Corona et al., 2021) is an observation-based caregiver-mediated tele-assessment of autism-related behaviors in toddlers. It has high rates of diagnostic agreement with in-person assessment (Corona et al., 2024). The Toddler Autism Symptom Inventory (TASI; Coulter et al., 2021) is a semi-structured caregiver interview that assesses autism-related behaviors in children under three. To our knowledge, limited research has compared the concordance of these two autism-related behavior measures to determine whether different information is obtained from caregiver report versus a brief observation. Understanding the concordance of these measures administered via telehealth can provide preliminary information about their individual contribution during the diagnostic process.

Objectives:

Compare concordance between the TAP and the TASI for 1) overall autism likelihood and 2) individual DSM-5 domain criterion items (social communication items A1-A3 and restricted, repetitive behavior (RRB) items B1-B4) to better understand the overlap of information gathered by both measures through telehealth.

Methods:

Data come from 95 children participating in a study in community early intervention settings across California. At enrollment, children were under 30 months ($M = 24.73$, $SD = 5.58$) and receiving services for social communication delays. Children were primarily male (67.37%) and Hispanic/Latino (55.79%). They were assessed using the TAP, with examiners rating seven key behaviors on a 1-3 Likert scale. A total score of 12 or higher indicates an increased likelihood of autism. Caregivers were interviewed using the TASI which provides an evaluation of the overall likelihood of autism and the presence or absence of each DSM-5 criterion.

TAP ratings were transposed to the DSM-5 criteria with a score of 3 on a behavior indicating the child met criteria for social communication items (A1, A2) or RRB items (B1, B4). Following the guidance of Kwiecien and colleagues (2011), Cohen's kappa was used to assess the concordance between the TAP and the TASI.

Results:

Comparisons demonstrated weak agreement between the TAP and TASI for the overall autism likelihood ($k = 0.44$), with agreement on 78.95% of cases ($N = 14$ autism unlikely, $N = 61$ autism likely). On DSM-5 criteria, we found minimal agreement for B1 ($k = 0.23$), and no agreement for A1 ($k = 0.16$), A2 ($k = 0.16$), and B4 ($k = 0.03$) criteria. Table 1 provides a breakdown of the agreement between the two measures. For DSM-5 criteria, we observed a pattern whereby information from caregivers on the TASI was more likely to result in the child meeting the individual criterion than from the brief TAP observation.

Conclusions:

These results demonstrate the importance of incorporating multiple sources of information in autism evaluation. Current gold standard measures of autism evaluation are strengthened by incorporating caregiver input and behavioral observations (Kim and Lord, 2012). These findings provide evidence that this is also the case for telehealth assessment. More research is needed to examine the individual strengths of each measure and their contributions to more accurate, best estimate autism diagnoses, especially during telehealth visits.



411.157 Creation of a Reliable Short-Form IQ Score Using the Stanford-Binet 5th Edition in Individuals with Autism and Other Developmental Disabilities

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Background: The Stanford Binet Intelligence Scales 5th Edition (SB5) is an intelligence test measuring cognitive ability across five domains including Fluid Reasoning (FR), Quantitative Reasoning (QR), Knowledge (KN), Visuospatial Processing (VS), and Working Memory (WM). Each of the five domains contains two subtests, verbal and nonverbal, for a total of ten subtests. The full SB5 can take between 60-90 minutes to complete. Due to clinical barriers (e.g., interfering behaviors, illness, unforeseen circumstances), it is not always possible to administer a full assessment. This might be especially true for autistic and neurodiverse children. Although the SB5 includes an Abbreviated Battery IQ (ABIQ) as a short-form option, it is only based on two subtests and is less valid in cases of high subtest scatter and has low long-term stability. However, alternative short-forms other than the ABIQ do not exist. Having a more robust short-form of the SB5 would provide additional flexibility for clinicians and researchers who are not able to complete the full 10-subtest SB5.

Objectives: We investigated various 5-subtest short-forms of the SB5 in order to find one that is more reliable and stable than the 2-subtest ABIQ, has more coverage than either the Verbal IQ (VIQ) or Nonverbal IQ (NVIQ), but does not take as long to administer as the 10-subtest FSIQ.

Methods: The sample consisted of SB5 administrations from N=5,466 individuals ($M_{age}=8$ years, $SD_{age}=3.6$ years, 24% female, 75% White, 13% Black, 7% Multiple Race, 5% Other Race) referred for developmental testing at a pediatric hospital in the Midwestern region of the USA between 2010-2023. Using data from 80% of the full sample, 20 different 5-subtest combinations (with one subtest per factor) were separately regressed onto FSIQ. The best-fitting 5-subtest combination was defined by the lowest Akaike information criterion (AIC) from the individual regressions.

We used this regression formula to create a regression-based short-form IQ score (SFIQ) and validated it on the remaining 20% of the sample. We compared the correlation of the SFIQ with FSIQ to those of the VIQ and NVIQ. The long-term stability of the SFIQ was tested on a subsample with repeated SB5 administrations ($n=654$; $M_{interval}=1.7$ years, $SD_{interval}=2.1$ years) using the intraclass correlation (ICC) from linear mixed-effects models.

Results: The best-performing short form consisted of verbal subtests from the FR and KN domains and nonverbal subtests from the VS, QR, and WM domains ($R^2=.94$). The correlation between SFIQ and FSIQ was very high ($r=.97$), significantly higher ($p<.001$) than those of the VIQ ($r=.95$) and NVIQ ($r=.95$), and not impacted by subtest scatter. The long-term stability of SFIQ ($ICC=.80$) was like those of VIQ ($ICC=.82$) and NVIQ ($ICC=.81$).

Conclusions: We found a robust 5-subtest short-form of the SB5 that showed a strong relationship to FSIQ and acceptable long-term stability. This short-form provides a reliable alternative to the existing ABIQ and takes half the time of the FSIQ. Using this short-form version allows providers to obtain a reliable estimate FSIQ when completing a full SB5 is not feasible, such as when clinical barriers arise during test administration.

411.158 Data-Driven Approach to Reducing Autism Waitlists: A Novel Multi-Disciplinary Clinic for Assessing Frank Presentations of Autism Spectrum Disorder (ASD)

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Background: The prevalence of ASD has increased in recent years, resulting in significantly longer waitlists at clinics internationally. These lengthy waitlists are problematic, leading to later diagnosis, which affects access to critical intervention services that are strongly associated with positive outcomes (Zwaigenbaum et al., 2015). Various research studies have examined potential solutions to reduce diagnostic waitlists. However, few studies have used a data-driven approach to reduce waitlists by seeing children for an expedited assessment. The Autism Behavioral Assessment & Consultation (ABC) Clinic is a pilot clinic within a larger hospital-based ASD center, tasked with reducing waitlists using an algorithm designed to screen for children with frank presentations of ASD. The ABC clinic provides a multi-disciplinary evaluation for those who meet the established criteria, creating a more efficient and thorough diagnostic process.

Objectives: The current study aimed to detail the structure and design of the ABC clinic and explore the demographics of patients who have screened into the clinic.

Methods: The ABC clinic, adapted from the Thompson Center at the University of Missouri, began in January 2024. Twenty-nine patients have screened into the clinic, with 11 patients completing evaluations to date. Patients evaluated through the ABC clinic must meet the following criteria: under 6-years-old, minimally verbal, and a positive score on an ASD screening measure (e.g., Modified Checklist for Autism in Toddlers, Revised (M-CHAT-R) or Social Communication Questionnaire (SCQ)). Caregivers must endorse either OCD or sensory concerns, or both, and must not endorse aggressive behaviors, depressive symptoms, or unusual or excessive fears. The evaluation includes the standard clinic intake (for all patients) followed by a single-day in-person assessment (unique to ABC). The in-person 4-hour evaluation includes a developmental assessment, the Autism Diagnostic Observation Schedule (ADOS-2), a pediatrician visit, and a feedback appointment.

Results: The results found that the mean score on the autism screening measure was clinically elevated (M-CHAT-R: $M=11.25$, $SD=2.87$, $n=8$; SCQ: $M=23.96$, $SD=4.31$, $n=21$). The sample included 24 male and 5 female patients, 10 of whom were White, 8 Black or African American, and 8 Asian. 9 patients identified as Hispanic. About 27.59% of the patients' families had an income under the poverty line. The mean wait between intake and evaluation was 100 days, a significantly shorter wait than our regular diagnostic clinic. Of the 29 patients who met criteria, 2 received alternative evaluations, 16 are awaiting appointments, and 11 have completed their evaluation. 100% of the patients evaluated have received an ASD diagnosis.

Conclusions: The preliminary data suggests that the ABC clinic is an effective approach towards fast-tracking diagnosis of ASD in frank presentations. This helps families gain access to necessary interventions. The clinic's streamlined structure reduces barriers in the diagnostic process, which may be beneficial for those facing challenges coordinating transportation, taking time off work, or finding childcare. With a higher prevalence of medical comorbidities in ASD, the inclusion of a pediatric appointment allows for patients to receive medical care and appropriate recommendations. The present study supports using a data-driven approach to reduce waitlists at centers internationally.

411.159 Item Level Effects of the ADOS-2 (Toddler Module) on Expert Clinician Certainty

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Background: The diagnosis of autism spectrum disorder (ASD), particularly in young children, can be complex. There are standardized tools (e.g., ADOS-2) that are used as an aide, but ultimately clinicians determine a final diagnosis. Previous literature has found that 30-40% of expert clinician diagnoses of ASD in toddlers and preschool-aged children are made with some level of uncertainty (McDonnell et al., 2018; Klaiman et al., 2022). In both studies, the greatest predictor of clinician uncertainty for both autistic and non-autistic toddlers was mid-level autism symptomatology.

Objectives: To understand factors that influence clinicians' final diagnosis, we aim to identify specific behaviors driving clinician certainty by analyzing item level associations between ADOS-2, Toddler module items, and certainty ratings.

Methods: Secondary analyses were performed using 16-30-month-old children from Klaiman et al.'s (2022) sample who received the ADOS-2 Toddler module (n=437). Item scores of 0-3 (or 0-4 for Item A1) were included for the purpose of this analysis; scores of 7-9 were excluded as they are not indicative of autism symptomatology. Per the ADOS-2 scoring rules, participants were assigned to a scoring algorithm based on age and/or language level, as indicated by their Item A1 score. Clinician certainty was rated on a 1 (0-20% certain) to 5 (81-100% certain) scale. Chi-square analyses between score and certainty rating were completed for each item. The Holm & Bonferroni method was used to account for multiple comparisons.

Results: Eight items (see *Table 1*) were significantly associated with clinician certainty. Among these items, we identified two primary categories: overall quality of social interaction and eye contact. Irrespective of final diagnosis, receiving a "1" on items in these categories decreased the chance that the clinician was 81-100% certain to < 50%. Notably, two items (B16A, C2) do not factor into either scoring algorithm. Multiple items significantly associated with certainty are only used in one of the scoring algorithms. For this reason, we repeated analyses, separating toddlers by which algorithm they received. Considering the 261 toddlers (ASD = 163) who were scored on Algorithm 1, six items impacted certainty (see *Table 2*), two of which (B16A, B18) are non-algorithm. Of the 176 toddlers (ASD = 63) who were scored through Algorithm 2, four items impacted certainty (see *Table 2*), all of which load onto the algorithm.

Conclusions: Beyond mid-level symptomatology, specific behaviors (e.g., quality of social interaction and eye contact) identified during the ADOS-2 impacted level of clinician certainty in a sample of 437 16-30-month-olds. Importantly, non-algorithm items are amongst those that affect certainty. These results highlight the complex diagnostic presentation of young children undergoing diagnostic evaluation. Results demonstrate the need for continued developmental monitoring and the use of biomarkers to help navigate the ambiguity of the heterogeneity of autism, particularly at this young age. More work is needed to determine if behaviors impacting certainty vary across demographic factors such as sex, race, and SES.



411.160 Developing a Quantitative Assessment Tool for Characterizing Social Domains in Autism

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Background:

Social difficulties are a cardinal feature of autism that frequently occur in other neurodevelopmental (NDD) and neuropsychiatric (NPD) conditions. Irrespective of the primary diagnosis, these difficulties can persist over time and contribute to poor outcomes for individuals and their families. However, despite their impact, the neurobiological mechanisms underpinning social difficulties are not adequately characterized by current diagnostic systems, which has stifled the development of effective supports. The Research Domain Criteria (RDoC) framework operationalizes a set of basic, biologically-driven processes that underpin social functioning, and, if disrupted, can impede one's ability to navigate the complexities of the social world. Quantifying these processes is critical for facilitating a better characterization of the social profiles seen in autism and other conditions and can eventually inform the personalization of supports. However, reliable, comprehensive and fit-for-purpose social functioning measures are sorely lacking.

Objectives:

Following methods outlined by the NIH Patient-Reported Outcome Measurement Information System (PROMIS) initiative to develop and stringently validate a new, dedicated measure of key RDoC social processes—Stanford Social Dimensions Scale (SSDS-2).

Methods:

A comprehensive item bank was developed to capture each of the RDoC constructs and sub-constructs. The preliminary item bank was reviewed by 50 research and clinical experts in social processing and six focus groups of parents of children who have autism, other neurodevelopmental conditions, or are neurotypical. Refined item bank was distributed online to parents of children with autism through the Simons Foundation Powering Autism Research for Knowledge (n= 984; M_{age}=11.23 years, SD_{age}= 3.56; 76% male) and parents of neurotypical (n= 1195; M_{age}=10.17 years, SD_{age}= 3.19; 54% male) and children with diverse NDD and NPD (n= 1281; M_{age}=10.65 years, SD_{age}= 3.27; 63% male). In addition to the SSDS-2 item bank, parents completed a battery of questionnaires to appraise convergent and divergent validity of the SSDS-2.

Results:

Confirmatory application of exploratory structural equation modeling (ESEM) was used to test the a priori factor structures of the SSDS-2, including 3-factor structure with broad attachment and affiliation (AA), social communication (SC) and understanding mental states (UMS) factors and with more fine-grained 6-factor solution encompassing AA, reception of facial and non-facial communication, production of facial and non-facial communication, and UMS factors. Both models showed strong fit indices with a 6-factor solution showing superior fit (comparative fit index and Tucker–Lewis index > .95, root mean square error of approximation and standardized root mean square residual < .06) and items loading onto the hypothesized factors. Crucially, the derived factor structure was invariant across age, sex, cognitive functioning and diagnostic status. Across all groups, all factors had good to excellent internal consistency (alpha ≥ .89), model reliability (omega ≥ .88), two-week test-retest reliability (ICC ≥ .86) and strong convergent and divergent validity.

Conclusions:

Our findings provide initial validation of a new scale designed to comprehensively capture individual differences in key social functioning processes. Future steps involve using the SSDS-2 in longitudinal studies and identifying informative subgroups with distinct profiles of strengths and areas of support across specific, well-defined social processes.

411.161 Developing an Objective Autism Index Using Arabic Remote Eye Tracking Paradigm for the Early Screening and Diagnosis of Autism Spectrum Disorder

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Background: Deficits in eye gaze are a hallmark feature of autism spectrum disorder (ASD) and are included in the gold standard diagnostic instruments. More than a decade of research into abnormalities of eye gaze has confirmed social attention deficit as a key feature of ASD. Across studies, diverse stimulus paradigms have elicited social attention abnormalities, ranging from decreased fixation to others' eyes and social scenes as early as 6 months of age, to gaze abnormalities during dyadic or joint attention bids in preschoolers and older children, to aberrant gaze toward dynamic social stimuli in order high-functioning individuals. Gaze patterns particularly those based on dynamic temporal analysis, may be a promising objective risk marker of ASD as well as a quantitative measure of autism symptoms spanning the full continuum of behavior. Developing an Arabic version of the tracking stimuli paradigm that mimics the English ones by previous studies to be used for Arabic-speaking individuals is challenging but promising.

Objectives: The primary aim of the present study was to create an objective, eye-based autism risk index using an Arabic version of the stimuli paradigm.

Methods: Children were recruited for comprehensive multidisciplinary evaluation of ASD and subsequently grouped by clinical consensus diagnosis (ASD n=150, non-ASD 120). Remote eye tracking using Arabic version stimuli. Dwell times were recorded for each priori-defined region of interest (ROI) and averaged across ROIs to create an autism risk index.

Results: Similar to the previous findings, the autism risk index had high diagnostic accuracy with the area under the curve (AUC)= .89 and .84, 95% CIs= .80-.97 and .70-.95, was strongly associated with Autism Diagnostic Observation Schedule-Second Edition severity score.

Conclusions: The autism risk index is a useful quantitative and objective measure of risk for autism in at-risk settings. Using the Arabic remote eye tracking paradigm proved to be as effective as the English version used in the previous research projects. Future research in larger samples is needed to cross-validate these findings. If a validated scale for clinical use, this measure could inform clinical judgment regarding ASD diagnosis and track symptom improvements.



411.162 Development and Initial Validation of Oera Baby: A Tool for Identifying Autism Spectrum Disorder Symptoms in Children Aged 18-48 Months from Low- and Middle-Income Countries

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Background:

Although early detection of ASD accompanied by appropriate treatment is considered a key factor for a positive prognosis, there is a lack of valid instruments to detect ASD based on objective measures for children under 48 months in LMIC.

One brief and low-cost tool for assessing behavioral markers of ASD available in Brazil is the Observational Evaluation for Autism-OERA. It includes 8 specific, and 5 global observational items designed for use by trained multidisciplinary professionals. OERA was previously validated to differentiate ASD children from typical development children aged 3 to 10 years, demonstrating high sensitivity (92.75%) and specificity (90.91%).

Objectives:

The present study aimed to: (1) review and adapt the OERA tool for younger children, aged 18 to 48 months; (2) evaluate the content of the revised test using expert judges; and (3) assess the applicability of the new version of OERA, referred to as OERA-Baby, by experts.

Methods:

The study was conducted in four stages: (1) adaptation and construction of the initial version of OERA-Baby; (2) evaluation of the adaptation through expert judges' analysis; (3) a pilot study to assess the instrument's applicability; and (4) development of the final version of OERA-Baby based on the findings from the pilot study.

Results:

In Stage 1, the main adaptations made to the original OERA for suitability with children aged 18-48 months included modifications to the application format, opportunities, materials, and the number of tests. This involved the inclusion of two specific tests and one global test aimed at observing behavioral rigidity.

In Stage 2, two expert judges evaluated the 19 OERA-Baby, finding them to be clearly defined and effective in distinguishing between children with ASD and those with typical development. The judges recommended adding a pre-application questionnaire and replacing certain terms in the manual for clarity.

In Stage 3, a pilot study involving 13 children aged 18-48 months—comprising both those with ASD and those with typical development—demonstrated that seven tests were suitable, while two tests required adjustments.

Finally, in Stage 4, the final version of OERA-Baby was developed, incorporating 9 specific tests and 10 adjusted global tests. This version received positive evaluations from 11 specialist professionals, who deemed the application appropriate for clinical use.

Conclusions:

The development and adaptation of OERA-Baby represent significant advancements in the early detection of ASD in children younger than four years-old in developing countries. The systematic approach undertaken throughout the four stages of this study ensured that the final version of OERA Baby is both valid and reliable, effectively distinguishing between children with ASD and those with typical development. The incorporation of expert feedback and the pilot study further validated the instrument's applicability in clinical contexts. As a brief, low-cost tool, OERA-Baby has the potential to enhance early screening efforts in resource-limited settings, thereby improving early intervention strategies, particularly in such environments.

Future research should focus on further validating OERA-Baby across diverse populations, particularly Spanish speakers, and exploring its effectiveness in clinical practice to optimize outcomes for young children with ASD.

411.163 Development and Validation of Robotic Detection Technology for Assessing Autism

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Background: Autism is a heterogeneous and complex neurological disorder. While significant training is required for clinicians to become proficient in diagnosing autism, given the heterogeneity of autism, only 60% to 70% of autism diagnoses made by licensed and experienced clinicians are made with certainty (Klaiman et al., 2024; Klin et al., 2000; McDonnell et al., 2019). There is also limited availability of experienced clinicians (Durkin et al., 2015), often resulting in long waiting times. An objective and standardized assessment for assessing autism is needed. There is a pioneering development of data-driven information and communication technology (ICT) solutions on improving objectivity and quantifying the diagnostic process, assessment, and evaluation of learning outcomes (reviews in (Bondioli et al., 2024). Yet, a few studies have explored the supporting role of robots in screening autism. Besides, they adopted either the Wizard-of-Oz (WoZ) paradigm or the semi-autonomous strategy (e.g., Arent et al. 2022) and largely focused on the detection of one autism feature (e.g., So et al., 2024).

Objectives: This study aimed to develop and validate robotic detection technology for assessing autism. It programmed an autonomous social robot to detect more than one autism feature (lack of eye gaze and repetitive motor movements) when engaging with children. We hypothesized that such technology would identify the presence or absence of autism, with the sensitivity and specificity reaching 0.8 or above and the Area under the Curve reaching 0.7 or above.

Methods: The robot HUMANE, installed with computer vision and linked with face and motion recognition technology, autonomously detected atypical eye gaze and repetitive motor movements, two of the features of autism, while narrating stories. It autonomously prompted the child if they did not establish eye gaze with the robot or produced motor movements for five seconds continuously. 119 three-to-six-year-old children ($M=4.53$, $SD=1.89$; 38 females) with or without autism participated. They all received the ADOS-2, the standard diagnostic tool for autism.

Results: HUMANE's detection performance – the number of robot prompts and the cumulative duration of inattentiveness/improper posture – was then validated against the calibrated severity score of ADOS-2 (see Table1). Sensitivity and specificity and DORs of indexes at the composite level performed better than those at the individual level. Similar results were found in the ROC curve analyses. The total number of robot prompts and the total inattentiveness and improper posture duration were competent in differentiating between the autistic and non-autistic groups with large AUCs of 0.86 ($SE=.03$; $p<.001$; 95%CI: .80-.93) and .84 ($SE=.04$, $p<.001$; 95%CI: .76-.91). The AUCs of individual indexes were lower, yet still higher than 0.7.

Conclusions: Our hypothesis was supported. The composite indexes generated in the detection of atypical eye gaze and improper posture systems could identify the presence or absence of autism in nearly 120 children, with sensitivity and specificity of at least .80 and AUCs of at least .84. As a result, this study has developed and validated robotic technology for assessing autism focusing on the autonomous detection of two features, atypical eye gaze and repetitive motor movements.



411.164 Development and Validation of the Currim Autism Digital Evaluation Tool (CADET) for Screening in Children with Limited Language Skills in Urban Karachi

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Background:

Early detection of Autism in children is critical to creating an autism-friendly environment leading to a better prognosis. In a low middle-income country like Pakistan, there is a dearth of trained professionals and a lack of infrastructure to screen Autism in children. This study aimed to develop and validate a technology-mediated culturally relevant screening tool, shifting the task of a detailed, gold-standard assessment by a trained professional to a layman by giving an equally robust screening of Autism in children in low-resource settings, enhancing chances of early diagnosis of Autism and hence improving prognosis.

Objectives:

- To develop a digital parent-report tool for the screening of autism in children with limited language skills aged 31 months and older
- To validate this digital tool for the same demographic.

Methods:

The study was conducted in two phases.

Phase 1: The 'Currim Autism Digital Evaluation Tool (CADET)' was developed in six steps, based on existing validated tools and expert consultation. Six animated video vignette items relevant to autism diagnosis were selected and each item was illustrated using two animations of autistic and typical behavior created in collaboration with the Technology Innovation Support Center at Aga Khan University. It was designed as a parent-report tool and included audio aid to support those who cannot read. CADET was pretested with five mothers, modified based on feedback, and prepared for validation.

Phase 2: The validation study consisted of content validity, construct validity, and criterion validity. Content validity had been established in phase one; experts selected the items and gave their consensus on the content of the six items. Construct validity and criterion validity were assessed by applying CADET to screen and to compare three groups of children who have been earlier diagnosed as autistic, atypically developing, and typically developing by the only standard tool economically accessible in Pakistan, the Childhood Autism Rating Scale. A total of 84 children, 28 in each group, were randomly selected from the records of the Out Patient Department of Children's Hospital, Aga Khan University Hospital. The participants were parents of children between 31 months and 10 years. Construct validity and criterion validity of CADET were assessed by internal consistency and ROC analysis using Stata 14 and Medcalc 19.6.

Results:

The construct validity was assessed by Cronbach's α with an estimated value of 0.93. CADET showed sensitivity of 96.4% (95% CI (81.6% - 99.9%) and specificity of 100% (95% CI (87.6% - 100.0%)) between typically developing and autistic children. It showed sensitivity of 96.4 (81.6 - 99.9) and specificity of 92.8 (76.5 - 99.1) between autistic and non-autistic atypically developing children and it showed sensitivity of 89.2 (71.7 - 97.7) and specificity of 100.0 (87.6 - 100.0) when non-autistic atypically developing children were compared with typically developing children. The mean score difference between autistic and typically developing children was 5.35 ($p < 0.001$) and between autistic and atypically developing children, 3.8 ($p < 0.001$).

Conclusions:

The tool's initial testing shows it works at par with the gold standard and can be easily used by a layperson.

**411.165** Development of a Brief Form of the Screening Tool for Autism in Two-Year-Olds: Accuracy in Detecting Autism Spectrum Disorder in Toddlers

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Background: Early intervention is crucial for improving long-term outcomes in toddlers with autism spectrum disorder (ASD). However, despite the presence of symptoms in early childhood, ASD is often not diagnosed until after the age of three. While several screening tools exist globally, there is a lack of efficient methods for early ASD detection in many countries, including Taiwan. This is particularly challenging due to clinicians' heavy workloads and limited time for comprehensive assessments. The Screening Tool for Autism in Two-Year-Olds (STAT) has shown effectiveness in identifying ASD, but its full version may be too time-consuming for clinical use.

Objectives: This study aimed to develop and evaluate a brief form of the STAT (STAT-BF) to efficiently screen toddlers under 36 months of age for ASD in Taiwan, with the goal of enhancing early detection and enabling timely interventions.

Methods: This two-phase study aimed to develop (Study 1) and validate (Study 2) the STAT-BF. Study 1 involved two samples ($N = 80$), each consisting of 20 toddlers with ASD and 20 with developmental delays (DD), all under 36 months of age. Independent-sample t-tests confirmed no significant differences in key demographic variables between groups. All participants were administered the full STAT. Chi-square tests with Bonferroni correction ($ps < .004$) identified STAT items that consistently differentiated ASD from DD across both samples. These items were used to create the STAT-BF. Receiver operating characteristic (ROC) analysis was then employed to determine the optimal cutoff score for the selected items. Based on the results of Study 1, Study 2 aimed to validate the STAT-BF using a larger sample of 251 children (81 ASD, 55 mild-ASD, 115 DD). All participants underwent assessments using the Mullen Scales of Early Learning, STAT, and Autism Diagnostic Observation Schedule. The sensitivity, specificity, and agreement with clinical diagnoses of the STAT-BF were evaluated in this sample.

Results: In Study 1, five of the 12 STAT items (Turn-taking, Bubbles, Snack, Balloon, and Bag of Toys) significantly differentiated between ASD and DD in both samples and were selected to form the STAT-BF. ROC analysis on the combined sample ($N = 80$) revealed that the STAT-BF had an optimal cutoff score of 3, with high sensitivity (.93) and specificity (.90). In Study 2, using the same cutoff score, the STAT-BF demonstrated high sensitivity (91.4% for ASD and 90.9% for mild-ASD) and specificity (80.9% for DD), showing strong agreement with clinical diagnoses. The STAT-BF exhibited excellent accuracy in distinguishing toddlers with ASD and mild-ASD from those with DD.

Conclusions: The STAT-BF showed excellent accuracy in identifying toddlers at risk for ASD before 36 months of age. It offered a more time-efficient alternative to the full STAT while maintaining good psychometric properties. This brief screening tool could facilitate early detection and intervention for ASD in clinical settings in Taiwan. Future research should focus on longitudinal studies to further validate the STAT-BF's predictive validity and explore its applicability in diverse clinical settings.

411.166 Developmental and Behavioral Skill Profiles Among Autistic and Nonautistic Students within General Education Classrooms

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Background: Education systems have critical gaps effectively identifying and serving autistic students in general education classrooms (Young et al., 2020). This may, in part, be due to problems identifying students who do not exhibit 'enough' academic or behavioral need in the early years (Reynolds et al., 2009). Sociocultural factors such as race and ethnicity, sex, and socioeconomic status also contribute to under-identification or misidentification (Golson et al., 2021, Sturm et al., 2021). Recognizing patterns of students' developmental and behavioral characteristics may, alternatively, outline the important information teachers need to effectively support the autistic students in their classrooms. **Objectives:** The current study investigated the heterogeneity in developmental and behavioral skills within a neurodiverse sample of students in general education classrooms. **Methods:** Participating students ($n = 223$) and teachers ($n = 27$) were recruited for a 4-year exploration project (R324A210288) examining teacher-student interactions within TK–5th grade general education classrooms. Teachers completed a battery of questionnaires outlining their students' developmental and behavioral skills, trained members of the research team administered diagnostic and academic measures, and families completed two autism diagnostic screening tools, the C-JARS (Mundy et al., 2017) and SRS-2 (Constantino, 2014). **Results:** We report preliminary findings on a neurodiverse subsample of 150 students ($M_{age} = 6.79$; $SD = 1.55$; 83 autistic). The sample of participants were racially, ethnically, and linguistically diverse; 46% were female. Latent profile analysis was conducted using Mplus with 11 variables derived from teacher-ratings of students' skills, including executive functioning (BRIEF-2; Gioia et al., 2015), sensory processing (SP2; Parham et al., 2021), adaptive behavior (Vineland-3; Sparrow et al., 2017), and the presence of problematic behavior (CBCL-TRF; Achenbach et al., 2007). Models were estimated using full maximum likelihood so that participants with partially complete data could be included. An increasing number of classes were tested, and each model was compared using the Bayesian Information Criterion (BIC). Individuals were assigned to their most likely class using posterior probabilities. We then characterized the profiles by demographic, diagnostic, and academic information. A 5 profile solution best described the students' constellation of developmental and behavioral skills within the classroom ($AIC = 11917.44$, $BIC = 12128.19$, Entropy = .98), showing excellent overall model fit, the best fit in comparison with models of 3 and 4 profiles, and strong overall membership probability. The profiles are illustrated in Figure 1; demographic and academic skills by profile are presented in Table 1. The profiles differed on the presence of autism eligibility, with profile 1 and 5 being associated with reduced odds ($p = 0.001$; 0.35), and profiles 2 and 3 ($p = 0.01$; 0.001) associated with increased odds of being autism eligible. **Conclusions:** Autistic students were observed in each profile, however, there were relatively more autistic students in profiles 2, 3 and 4, which were characterized by differences in executive functioning, sensory processing, socialization and communication patterns, and the presence of behavior problems. Next, we will examine the influence of sociocultural factors on profile membership and investigate how profile membership predicts autism classification and academic achievement.



411.167 Differential Impact of Developmental Milestones, Demographic Factors, and Behavioral Features on Autism Screening in Boys and Girls

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Background: Previous research has shown that girls with a parent reported autism diagnosis may be less likely to meet the cut off score on the Social Communication Questionnaire (SCQ) and that an autism diagnosis may be given earlier to children who displayed delayed toileting milestones (Dillon et al., 2021; Petrou et al., 2018). Research also suggests that the accuracy of the SCQ may be impacted by income, parental education, and parental race for both boys and girls (Moody et al., 2017; Rosenberg et al., 2019). These findings were further supported by a recent study that found girls who had delayed milestones, parents with higher education, and scored within the clinical range on Thought Problems and Attention Problems were more likely to meet the cut off score (Kniola et al., 2024).

Objectives: The purpose of the current study was to expand on the findings of Kniola et al., (2024) and examine how milestone development, demographics, and emotional/behavioral functioning influence whether boys and girls (ages 4 to 18) with a previous diagnosis of autism are captured by a commonly used Autism screening tool (Social Communication Questionnaire: SCQ). We hypothesized that autistic individuals with fewer developmental delays, whose parents have lower education or are Black or Multiracial would be more likely to receive lower SCQ scores below the cutoff. Further, those with more symptoms of Withdrawal/Depression, Social Problems, Thought Problems, and Attention Problems on the (Child Behavioral Checklist: CBCL) would be more likely meet the SCQ cutoff.

Methods: A subset of participants enrolled in a large national cohort (SPARK) were included (40,174 autistic individuals, male = 31,460, female = 8,741). A cutoff score on the SCQ of 11 was used to form groups: Meet (M: 91.1% for males, 87.1% for females) and Not Meeting (NM: 8.9% for males, 12.9% for females).

Results: Autistic females were less likely than males to meet the cutoff. Autistic individuals who had delayed toileting and motor milestones and whose parent's attained higher education were more likely to meet the cutoff. Individuals who scored within the clinical range on the CBCL Thought Problems and Attention Problems syndrome scales were more likely to meet the cutoff. Race and reported symptoms on the Withdrawn/Depressed and Social Problems syndrome scales did not relate to meeting the cutoff for females. However, autistic males whose parents reported clinical symptoms on the Withdrawn/Depressed and Social Problems syndrome scales were more likely to meet the cutoff. Lastly, males who were white were less likely to meet the cutoff.

Conclusions: Results highlight the differences in presentation between males and females. The results also suggest that boys who present with typical symptoms may also be missed during the screening process based on race. Future research should examine additional factors that put children at a disadvantage for being accurately identified, which could impact access to early intervention services and future skill development.

411.168 Differential Item and Test Functioning of the Autism Diagnostic Interview-Revised across Race and Ethnicity in Preschool Age Children

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Background:

The Autism Diagnostic Interview-Revised (ADI-R) is a standardized parent interview widely used to assess the presence of autism spectrum disorder (ASD) traits. To date, no large-scale comparative psychometric analyses of the ADI-R across racial and ethnic groups have been conducted.

Objectives:

To investigate differential item functioning (DIF) and differential test functioning (DTF) of non-Hispanic White (NHW) vs. non-Hispanic Black (NHB) and Hispanic children on the ADI-R. Data come from the Study to Explore Early Development, a large case-control study of children with ASD 30–68.9 months old.

Methods:

Children completed an evaluation to determine study group status and developmental functioning. A two-step procedure was implemented to detect DIF and DTF: 1) likelihood-ratio χ^2 tests conducted sequentially to identify differential probabilities between NHB-NHW and Hispanic-NHW item endorsements for each ADI-R domain with all other items set as “anchors” and 2) items with $p_{B-H} < .05$ indicating DIF were then allowed to vary with all non-significant items set as anchors. Racial-ethnic differences were interpreted using Cohen’s d criteria: negligible, $d < .2$; small, $d \geq .2$ and $< .5$; moderate, $d \geq .5$ and $< .8$; and large, $d \geq .8$.

Results:

2,670 participants had ADI-R data of whom 1691 were NHW, 810 NHB, and 394 Hispanic.

NHW vs. NHB: No items on the *Communication* domain displayed DIF. Three items on the *Social* domain displayed DIF: 53 (shares; $d = 0.28$; small), 55 (offers comfort; $d = 0.25$; small), and 31 (uses others body to communicate; $d = 1.61$; large DIF) *large*. Three items on the *Restricted and Repetitive Behaviors (RRB)* domain displayed DIF: 69 (repetitive behaviors/interests; $d = 0.48$; small), 70 (compulsions/rituals; $d = 0.41$; small), and 71 (unusual sensory interests; $d = 0.72$; moderate). DTF was negligible for the *Communication* ($d = 0.03$) and *Social* ($d = -0.04$) domains and small for the *RRB* ($d = 0.28$) domain.

NHW vs. Hispanic: No items on the *Communication* domain displayed DIF. Two items on the *Social* domain displayed DIF: 31 (uses others body to communicate; large DIF) and 55 (offers comfort; small DIF). One item on the *RRB* domain displayed DIF: 70 (compulsions/rituals; small DIF). DTF was negligible for all scales ($d = 0.01, d = 0.01$, and $d = 0.09$, respectively).

Conclusions:

Compared to NHW children. Both NHB and Hispanic children showed large item-level differences on using others’ body to communicate. It is unclear why this item performed so differently across groups and warrants consideration. Regardless, DTF was mostly negligible and suggest that the ADI-R performs similarly across racial-ethnic groups. Findings can be used by clinicians to consider the equity of the ADI-R when diagnosing children with ASD and determining their treatment needs.

411.169 Differential Item and Test Functioning of the Autism Diagnostic Observation Schedule – Second Edition (ADOS-2) across Race and Ethnicity in Preschool Age Children

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Background: The Autism Diagnostic Observation Schedule–Second edition (ADOS-2) is a standardized child observation used to assess the presence of autism spectrum disorder (ASD) traits. To date, few large-scale comparative psychometric analyses of the ADOS-2 across racial and ethnic groups have been conducted.

Objectives:

To investigate differential item functioning (DIF) and differential test functioning (DTF) of non-Hispanic White (NHW) vs. non-Hispanic Black (NHB) and Hispanic children on ADOS-2 modules 1/2. Module 1 was designed for children with no/some words. Module 2 was designed for children with phrase speech. Data come from the Study to Explore Early Development, a large case-control study of children with ASD 30–68.9 months old.

Methods:

Children completed an evaluation to determine study group status and developmental functioning. A two-step procedure was used to detect DIF/DTF: 1) likelihood-ratio χ^2 tests were conducted sequentially to identify differential probabilities between NHW-NHB and NHW-Hispanic item endorsements with all other items set as “anchors” and 2) items with $p < .05$ indicating DIF were then allowed to vary with all non-significant items set as anchors. Racial-ethnic differences were interpreted using Cohen’s d criteria: negligible, $d < .2$; small, $d \geq .2$ and $< .5$; moderate, $d \geq .5$ and $< .8$; and large, $d \geq .8$.

Results:

1,784 participants had ADOS-2 data of whom 883 were NHW, 607 NHB, and 294 Hispanic.

NHWvs.NHB

Module 1: One item on the *Social-Affect* domain displayed DIF: B-10 (joint attention; $d = 0.41$; small). No items on the *RRB* domain displayed DIF. DTF was negligible for both scales ($d = 0.02$ and $d < 0.01$, respectively).

Module 2: One item on the *Social-Affect* scale domain DIF: A-6 (pointing; $d = 0.63$; moderate). No items on the *RRB* domain displayed DIF. DTF was negligible for both scales ($d = 0.05$ and $d = 0.03$, respectively).

NHWvs.Hispanic

Module 1: Three items on the *Social-Affect* domain displayed DIF: A-2 (frequency of vocalizations ; $d = 0.36$; small), B-4 (integration of gaze ; $d = 0.26$; small), and B-10 (joint attention; $d = 0.37$; small). Two items on the *RRB* domain displayed DIF: D-1 (unusual sensory interests; $d = 0.38$; small) and D-2 (complex mannerisms; $d = 0.31$; small). DTF was negligible for both scales ($d = 0.05$ and $d = 0.07$, respectively).

Module 2: One item on the *Social-Affect* domain displayed DIF: A-6 (pointing; $d = 0.58$; moderate). No items on the *RRB* domain displayed DIF. DTF was negligible for both scales ($d = 0.08$ and $d = 0.07$, respectively).

Conclusions:

Compared to NHW children, both NHB and Hispanic children showed small differences on Module 1 initiation of joint attention, and moderate differences on Module 2 pointing. These differences warrant consideration. Regardless, DTF was negligible and suggest that overall, the ADOS-2 performs similarly across racial-ethnic groups. Findings can be used by clinicians to consider the equity of the ADOS-2 when diagnosing children with ASD and determining their treatment needs.

411.170 Differential Item and Test Functioning of the Social Responsiveness Scale – Second Edition (SRS-2) across Race and Ethnicity in Preschool Age Children

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Background: The Social Responsiveness Scale – Second edition (SRS-2) is a standardized parent-report questionnaire used to screen for autism spectrum disorder (ASD) traits. To date, no large-scale comparative psychometric analyses of the SRS-2 across racial and ethnic groups have been conducted.

Objectives: To investigate differential item functioning (DIF) and differential test functioning (DTF) of non-Hispanic White (NHW) vs. non-Hispanic Black (NHB) and Hispanic children on the SRS-2. Data come from the Study to Explore Early Development, a large case-control study of ASD in children 30–68.9 months old.

Methods: Children completed an evaluation to determine study group status and developmental functioning. A two-step procedure was implemented to detect DIF and DTF: 1) likelihood-ratio χ^2 tests were conducted sequentially to identify differential probabilities between NHW-NHB and NHW-Hispanic item endorsements for each scale with all other items set as “anchors” and 2) items with $p < .05$ indicating DIF were then allowed to vary with all non-significant items set as anchors. Racial-ethnic differences were interpreted using Cohen’s d criteria: negligible, $d < .2$; small, $d = .2$ and $< .5$; moderate, $d = .5$ and $< .8$; and large, $d \geq .8$.

Results:

5,868 participants had SRS-2 data of whom 3,682 were NHW, 1,385 NHB, and 801 Hispanic. See Table 1 for additional demographic and descriptive information.

Racial-ethnic differences are presented for items that showed moderate to large DIF.

NHW vs. NHB: Three of 65 items (4.6%) on the *Total* scale displayed DIF: one large (separates easily from caregivers) and two moderate (focuses attention and overly suspicious of others). Four items on the *Social-Awareness* domain displayed moderate DIF (aware of others, focuses attention, mis-matched facial expressions, and reacts to people as objects). One item on the *Social-Cognition* domain displayed moderate DIF (overly suspicious of others). One item on the *Social-Communication* domain displayed moderate DIF (overly serious facial expressions). One item on the *Social-Motivation* domain displayed large DIF (separates easily from caregivers). None of the items on *Autistic-Mannerisms* domain displayed moderate or large DIF. Overall, DTF was negligible or small for the total scale and each of the five domains.

NHW vs. Hispanic: Two of 65 items (3.1%) on the *Total* scale displayed large DIF (overly suspicious of others and separates easily from caregivers). One item on the *Social-Awareness* domain displayed moderate DIF (doesn’t mind being out-of-step with others). One item on the *Social-Cognition* domain displayed large DIF (overly suspicious of others). No items on the *Social-Communication* domain displayed moderate or large DIF. One item on the *Social-Motivation* domain displayed large DIF (separates easily from caregivers). No items on *Autistic-Mannerisms* domain displayed moderate or large DIF. Overall, DTF was negligible for the total scale and each of the five domains.

Conclusions: Compared to NHW children, both NHB and Hispanic children showed moderate to large item-level differences on being overly suspicious of others and separating easily from caregivers. These differences warrant consideration. Regardless, DTF was negligible and suggest that overall, the SRS-2 performs similarly across racial-ethnic groups. Findings can be used by clinicians to consider the equity of the SRS-2 when screening children for ASD.



411.171 Discrepancies between Clinician and Caregiver Ratings of Autism-Related Behaviors

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Background: Parents' concerns regarding their child's development are a key component of clinical evaluations for autism spectrum disorder (ASD), informing clinicians of a child's symptoms across time and contexts. Since early diagnosis is a key predictor of better cognitive outcomes (Clark et al., 2018), it's imperative that we consider parent-clinician agreement in this window of time. However, several studies have highlighted informant discrepancies in ASD symptomatology ratings (e.g. Lerner et al., 2012; Jordan et al., 2019). In a recent paper, Azu et al. (2024) found that caregivers of 6-11-year-olds rated autism-related symptoms higher for males than females compared to clinicians, and that overall caregiver-clinician discrepancy was correlated with age of diagnosis and intervention hours.

Objectives: To further understand the role of parental reports in the early diagnosis of autism, we aim to assess clinician-caregiver discrepancy and external factors which may influence this discrepancy in a sample of children diagnosed between two and twelve years of age.

Methods: Analyses were conducted using data from 737 children in the SPARK cohort, all of whom were diagnosed with ASD. Participants were selected if they had completed an Autism Diagnostic Observation Schedule (ADOS-2), Social Communication Questionnaire (SCQ), and demographic surveys. Spearman's rank correlation coefficients were used to assess relationships between ADOS-2 and SCQ scores. Analyses were divided into two age groups: 2-5 years (24-72mos) and 6-11 years (72-144mos). A clinician-caregiver discrepancy variable was created by subtracting the z-scores of SCQ total scores from ADOS CSS z-scores. Wilcoxon rank-sum tests and Kruskal-Wallis tests compared discrepancies by gender and parent-reported cognitive level and support needs, while Spearman correlations examined associations between discrepancies and sex, age of diagnosis, age of first concern, and delay between first concern and diagnosis.

Results: Across age groups, ADOS-2 CSS scores and SCQ final scores had a significant, positive correlation. Clinician-caregiver discrepancy did not differ by gender or age of diagnosis in either group. Later-reported first concerns were associated with greater clinician-caregiver discrepancy in the 6-11 group, with clinicians rating symptom severity as greater than caregivers. Trending in the opposite direction, a greater delay between first concern and diagnosis was related to lower clinician ratings relative to caregiver ratings in both groups. Clinician-caregiver discrepancies were also associated with parent-estimated cognitive level and support needs, such that higher support needs and lower cognitive level groups received significantly lower clinician symptom ratings relative to caregiver ratings.

Conclusions: The caregiver-clinician dyad makes a critical team in the autism diagnostic journey. While the clinician completes well-validated assessments, parents fill in gaps of behaviors and symptomatology otherwise not seen within a clinic setting. Our findings suggest that in cases where parents note first concerns later, they may be underreporting symptoms. In cases that are confounded by possible co-occurring conditions, clinicians may be rating autism-specific symptom severity lower than scores generated by a standardized parent questionnaire. More work is needed to better understand parent-clinician discrepancies and how we can improve our clinician-administered and parent-report tools to ensure we are getting a holistic picture of the child.



411.172 Discrepancy between Frequency and Functional Impact of Autistic Features As Assessed By the Autism Impact Measure: Associations with Child and Family Characteristics

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Background: Autistic features have traditionally been assessed by behavioral frequency alone, which may not accurately reflect their impact on daily-life functioning (Kanne et al., 2014). The recently developed parent-reported questionnaire, the Autism Impact Measure (AIM), allows for evaluating both behavioral frequency and functional impact of autistic features. However, evidence on how well these two aspects align or differ in assessing needs related to autistic features remains limited. Identifying ‘protective’ factors linked to limited functional impact despite the frequency of autistic features can have important clinical implications.

Objectives: Using parent-reported data from the baseline of Pediatric Autism Research Cohort study—a Canadian prospective study involving children diagnosed with autism at ages 2 to 7 (N=279), this study aimed to: 1) estimate the discrepancies between behavioral frequency and functional impact across five AIM constructs (Repetitive Behavior, Atypical Behavior, Communication, Social Reciprocity, and Peer Interaction); 2) identify child and family characteristics associated with frequency-impact discrepancies for each AIM construct.

Methods: Twenty-nine AIM items that have demonstrated superior psychometric validity in previous research (Mazurek et al., 2020) were used for the current analyses. A latent difference model with partial scalar invariance across frequency and impact scales (see Figure 1 for model specification) was used to derive latent estimates of frequency-impact discrepancies ($\Delta\text{Imp-Freq}$) for each AIM construct separately. Child characteristics (age and sex assigned at birth) and family characteristics (primary caregiver’s education level, race/ethnicity, and household income) were included to examine their associations with frequency-impact discrepancies.

Results: On average, the latent difference estimates of frequency-impact discrepancies were significantly below 0 ($\Delta\text{Imp-Freq} = -.194$ to $-.585$, all $p < .001$), indicating that parents generally rated functional impact lower than behavioral frequency across AIM constructs. As shown in Figure 2, these $\Delta\text{Imp-Freq}$ estimates are highly variable (all variance parameters $p < .001$), with Social Reciprocity showing the greatest variability among all AIM constructs, whereas Communication showed a closer alignment between frequency and functional impact ratings. Older children tended to show more frequent atypical behaviors ($\beta = .190$, $p = .009$) but fewer social-communication difficulties ($\beta = -.181$ to $-.322$, all $p < .01$). Higher caregiver education and older child age were associated with greater $\Delta\text{Imp-Freq}$ estimates in repetitive/atypical behavior and communication difficulties ($\beta = .170$ to $.354$, all $p < .05$), while higher household income was associated with lower $\Delta\text{Imp-Freq}$ estimates in atypical behavior ($\beta = -.276$, $p = .003$). Neither child’s sex nor caregiver’s race/ethnicity was associated with frequency or frequency-impact discrepancy.

Conclusions: Our findings revealed substantial individual variability in the discrepancies between behavioral frequency and functional impact of autistic features during early childhood, particularly in social-reciprocity challenges, where the functional impact may be more contextually dependent than other autistic features. Older children showed greater functional impacts than expected based on frequency, likely due to increasing environmental demands. Higher household income may play an indirect role in buffering the functional impact of behavioral challenges, while higher-educated caregivers might have heightened expectations or be more attentive to how their child’s autistic features impact daily life. Our results highlight the importance of further research in developing family-centred, tailored strategies to foster autistic children’s resilience toward daily-life challenges associated with autistic features.



411.175 Early Identification of Autism in Toddlers with Early Medical Risk through Integrated Specialty Clinic

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Background: Toddlers with early medical risk due to pre-term delivery, low birth weight, or conditions requiring Neonatal Intensive Care Unit (NICU) stays are more likely to be identified with a neurodevelopmental condition as compared to healthy infants with term-birth (Davis et al., 2023). Approximately 7% of pre-term infants are later diagnosed with autism (Agrawal et al., 2018), compared to 2.7% in the general population (CDC, 2020). The average time from autism screening to evaluation in the United States is over two years (Chen et al., 2023), delaying access to early intervention. Identification of autism in toddlers with early medical risk can be further complicated by screening measure limitations and overshadowing by co-occurring developmental and medical conditions (Guy et al., 2015; McDonald & Jeste, 2022). Current care models for infants with medical risk include primary care pediatrics, subspecialty, and multi-disciplinary care, such as through High-Risk Infant Follow-up clinics (HRIF; Litt & Campbell, 2023). Emerging evidence suggests autism screening and evaluation in the context of HRIF using an integrated specialty care model results in earlier identification of autism (Raches et al., 2024).

Objectives: This study examines the effectiveness of autism screening and surveillance in an HRIF clinic and referral to integrated ‘fast-track’ autism evaluation clinic for reducing time to diagnosis in toddlers with early medical risk.

Methods: A retrospective chart review will be conducted of patients seen by a multi-disciplinary HRIF clinic and referred for autism evaluation following elevated screening or surveillance. Autism screening results, percentage of autism diagnoses, time from referral to evaluation, and age at diagnosis will be evaluated. Findings will be compared before and after the addition of a fast-track autism evaluation clinic within the developmental pediatrics department, and to national averages.

Results: Preliminary findings are reported. 50 patients were referred to fast-track autism evaluation clinic from an HRIF clinic. Of these patients, 27 were seen in fast-track clinic for autism evaluation (54%), 11 pending upcoming visit or scheduling (22%), 5 did not attend evaluation appointments (10%), 2 were diagnosed during regular HRIF visit (4%), 2 in other clinics (4%), and 3 declined referral (6%). Of the 31 patients evaluated for autism, 22 received an autism diagnosis (71%). Average time from referral to evaluation in fast-track clinic was 4.1 months and age at evaluation was 31.9 months-old, compared to national averages of 26.9 months wait and 48 months-old, respectively (Chen et al., 2023).

Conclusions: Conducting autism screening and surveillance in HRIF may reduce barriers to early identification, despite limitations of screening measures for these infants. An integrated specialty care model with referral to fast-track autism evaluation clinic yielded lower wait times and age at diagnosis than national averages. Some families declined or did not attend the autism evaluation appointments or received diagnoses in other clinics. Multiple pathways for autism screening and evaluation may be important for improving early identification and access to intervention for toddlers with early medical risk.

411.176 Emotion Dysregulation Predicts Impairments in Peer Interaction and Adaptive Functioning in Kindergartners with ASD

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Background: Emotional Dysregulation (ED) refers to difficulties in using adaptive strategies to modulate emotional arousal and express it in socially appropriate ways (Gross et al., 2014). Early studies mainly focused on how ED affects comorbid mental health outcomes such as anxiety, depression and aggressive behavior in adolescents and adults with ASD. However, ED has been suggested to play a key role in prosocial skills and adaptive functioning in autistic children (Berkovits et al., 2017). Despite the emerging importance of ED as a factor influencing various early childhood developmental milestones, few studies have examined the relation between ED and peer engagement and everyday adaptive functioning in young children with ASD.

Objectives: This longitudinal study aims to understand whether categorical and continuous profile of ED at kindergarten-entry(T1) based on a widely used parent report, the Child Behavioral Checklist (CBCL), significantly predicts peer play skills and adaptive functioning in autistic children at kindergarten-entry(T1) and -exit(T2).

Methods: Participants included 74 children with ASD aged 52-79 months at T1 (Mage = 63.24 months, SDage = 5.08; 18 females) and 65-87 months at T2 (n=60, Mage = 72.48, SDage = 4.41). Caregivers completed the Child Behavior Checklist (CBCL) at T1, the Penn Interactive Peer Play Scale (PIPPS) and the Vineland Adaptive Behavior Scales-3 (VABS-3) at both T1 and T2. Furthermore, the severity of ED was measured based on the CBCL Depression Profile (CBCL-DP; Althoff et al., 2010) and CBCL Emotion Dysregulation Index (CBCL-EDI; Samson et al., 2014). The CBCL-DP is classified into three levels: typical (t-score below 180), moderate (t-score 181-209), and severe (t-score above 210). The CBCL-EDI ranges from 0 to 36 using a subset of items on the CBCL, with higher scores indicating more severe ED. Hierarchical linear regression was conducted after controlling for age, gender, and NVIQ to analyze whether ED assessed at T1 significantly predicts autistic kindergarten's concurrent(T1) and future(T2) peer interactions using the PIPPS T-scores (i.e., Play Disconnection, Play Disruption, Play Interaction) and Vineland Standard scores (i.e., Communication, Socialization, Daily Living Skills). In addition, one-way ANOVA was used to compare significant mean differences in the PIPPS and Vineland scores among the three CBCL-DP classifications.

Results: Hierarchical linear regression revealed that T1 CBCL-DP classifications and CBCL-EDI scores significantly predicted most domains of PIPPS and VABS-3 at T1 (all p 's<.001) except for the CBCL-EDI for Play Interaction (p =.084). For the longitudinal prediction, T1 CBCL-EDI scores significantly predicted all domains of PIPPS and Socialization of Vineland at T2 (all p 's<.001). T1 CBCL-DP classifications significantly predicted all Vineland domains and Play Interaction of PIPPS at T2 (all p 's<.01). There was a significant mean difference in Play Disruption both at T1 ($F(2, 70) = 16.26, p<.001$) and T2 ($F(2, 58) = 20.96, p<.001$) across three CBCL-DP categorical groups.

Conclusions: This research demonstrates a cascading effect of ED that continues to affect the quality of peer engagement and adaptive functioning in kindergarteners with ASD. Therefore, targeting ED even before school-entry can help maximize important functional outcomes, such as peer engagement and adaptive functioning during school transition.



411.177 Enhancing Autism Diagnostic Capacity in Bolivia Using an Echo Model

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Background:

One direct pathway to diagnosis involves recognition of early symptoms and referral for a developmental evaluation with a highly-trained medical professional. In low- and middle-income countries (LMICs), limits in public awareness of ASD symptoms, financial restraints, and professional capacity impede this pathway (Bhavnani et al., 2022; Jaen-Varas et al., 2014; Montenegro et al., 2022). In Bolivia, a LMIC in South America, there is no standardization for referrals, extreme geographic dispersion, few pre-professional programs, and a shortage of highly trained diagnosticians (Divan et al., 2021; Jaen-Varas et al., 2014). The pathway from recognition of symptoms to referral and diagnosis is tenuous in Bolivia for many families, resulting in extremely lengthy delays in identification and in connection to therapeutic supports.

Virtual professional development is a promising strategy to enhance diagnostic capacity across geographic distances. The ECHO framework (Extension for Community Healthcare Outcomes) provides training to professionals across geographic distances, improving care for various medical conditions, including ASD (Sanjeev et al., 2016; Sohn 2022; Mazurek 2017). Owing to its cost-effectiveness, virtual platform, and adaptability to diverse cultural contexts, ECHO has successfully increased ASD diagnostic capacity in multiple LMIC settings (Sungupta 2022; Giachetto 2019).

Objectives:

This project aimed to identify a means of enhancing the diagnostic pathway from recognition of symptoms to receipt of diagnosis in Bolivia using an ECHO professional development program.

Methods:

Diagnosticians (n=93 providers credentialed to give ASD diagnoses in Bolivia completed pre- and post-surveys on their ASD competence and confidence and attended 10 monthly ECHO sessions. Sixteen also completed post-interviews. Referring individuals were those who could provide referrals for diagnostic evaluations. Several hundred registered for one of two live webinars (n = 38 and 58 respectively), and four completed post-interviews. All participants were recruited via social media ads targeted to healthcare and educational professionals.

Each ECHO session included community building time, a didactic presentation on ASD evaluation, and a case presentation: one diagnostician described a patient's evaluation procedures and results, and received recommendations from group members. The ECHO hub team, four Bolivian ASD experts and the first author, facilitated the sessions and providing expert support. A final session with diagnosticians and referring individuals promoted local referring networks.

Results:

Surveys results indicated that diagnosticians' ASD competence ($p<.05$) and self-efficacy in ASD evaluations ($p<.05$) increased following the ECHO. Diagnosticians perceived a reduction in barriers ($p<.001$), and an increase in their professional networks ($p<.001$). Diagnosticians were also administering more ASD screening tools and diagnostic assessments ($p<.05$), and were referring for intervention supports more often ($p<.001$) following the ECHO. Interviews with diagnosticians and referring individuals will be analyzed qualitatively using a grounded theory approach. Preliminary results indicate an increase in valid accessible evaluation procedures, an increase in referrals, and a reduction in barriers related to professional capacities, but major remaining barriers is the systems of care and financial constraints.

Conclusions:

The ECHO methodology offers promise for increasing professional capacity for ASD care in LMIC. Potential for sustainability should be explored to maximize benefit.

411.178 Establishing Measurement Invariance of the Promis Depressive Symptoms Scale across Teen Self-Report and Parent Proxy Report

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Background: Autism research often assumes that parent proxy report and self-report can be treated as equivalent, even when measuring subjective constructs like depression. In order to treat such scores as equivalent, researchers must first establish that the scale measures the same construct in the same way across both groups, which can be done by assessing measurement invariance. The Patient-Reported Outcomes Measurement Information System (PROMIS) Depressive Symptoms scale has been soundly validated to measure depression in autistic adolescents, having previously demonstrated scalar invariance between the general population and autistic teens (Kaplan-Kahn et al., 2024); however, the question remains whether teen self and parent proxy report can be compared.

Objectives: Determine whether the PROMIS Depressive Symptoms scale demonstrates measurement invariance across autistic teen (14-17) self-report and parent proxy report.

Methods: We evaluated the pediatric self-report (Irwin et al., 2010) and parent proxy report (Irwin et al., 2012) short forms of the PROMIS Depressive Symptoms scale. Only items included in both versions of the scale were included in analyses. We conducted secondary CFAs on data from 139 parent-autistic teen dyads (Graham Holmes et al., 2020), using the lavaan package in R (Rosseel, 2012). After determining satisfactory fit for a unidimensional CFA model applied to separate and combined groups, we evaluated measurement invariance using multi-group confirmatory factor models. Levels of invariance assessed included configural (equality of structures), metric (equality of loadings), and scalar (equality of intercepts). Rather than relying on arbitrary cutoffs for determining “significant” non-invariance at each level, we utilized permutation testing with the semTools package in R, randomizing group assignment to obtain empirical distributions for fit indices (Jorgensen et al., 2018). Our analysis tested whether equivalent scores on the scales imply equal levels of the construct as reported by parents and teens. Additionally, we evaluated reliability using Cronbach’s alpha and used a t-test to check for group differences.

Results: Invariance was determined based on nonsignificant chi-squared and Comparative Fit Index (CFI) values under permutation testing (p -values $> .01$). The Depressive Symptoms model demonstrated configural, metric, and scalar invariance across groups (Table 1). Reliability was high across both groups and there was no significant difference in group t-score means (Table 2).

Conclusions: Because the PROMIS Depressive Symptoms scale demonstrates scalar invariance across parent proxy and teen self-report, researchers can confidently use this scale with both autistic teens and their parents, including meaningfully comparing scores between groups. Our study shows that autistic teens and their parents report depression at similar levels. Our finding allows researchers to ask the same questions of both autistic teens and their parents, allowing for triangulating responses and broadening the research population to include teens who may not be able to accurately self-report.



411.179 Evaluating the Agreement across Common Measures of Core Autism Symptoms

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Background: Different measures for autism symptoms are based on distinct sources of information and assessment procedures. The Autism Diagnostic Observation Schedule (ADOS) (Lord et al., 2012), measures symptoms in a specific, diagnostic situation where an individual interacts with an adult assessor. The Autism Diagnostic Interview-Revised (ADI-R) (Lord et al., 1994) measures symptoms through a structured parent interview administered by an assessor. The Social Responsiveness Scale (SRS) measures symptoms with a relatively short parent questionnaire. Many studies evaluating autism symptoms use one of these measures, often implicitly assuming that they measure the same construct. Recent reports, however, have shown modest correlations across their scores (Putnam et al., 2024; Ratto et al., 2018).

Objectives: To assess the agreement across autism symptom severity levels estimated by four measures listed below in the same children, while also separating severity scores for the social-communication and the restricted and repetitive behavior (RRB) domains. We also perform a factor analysis to determine whether a common factor for autism symptoms can be extracted across measures.

Methods: Seven-hundred and fifteen 2-to-5-year-old autistic children were evaluated from two cohorts: 1) the University of California, Davis MIND Institute Autism Phenome Project cohort, and 2) the Simons Simplex Collection cohort. Children were evaluated using four measures: ADOS-2 (clinician observation), ADI-R (clinician-administered parent interview), SRS (Constantino, 2002) (parent questionnaire) and Repetitive Behaviors Scale-Revised (RBS-R) (Bodfish et al., 2000), (parent questionnaire). First, we evaluated correlations between pairs of measures to quantify their agreement in estimating symptom severity per child. Second, we conducted a Factor Analysis to evaluate if a common factor for autism symptoms exists across measures. We performed both analyses separately for overall, RRB, and social-communication severity.

Results: The correlations analysis showed that symptom severity levels assessed by measures based on parental interviews and questionnaires (ADI, SRS, and RBS) exhibited medium-to-medium-high associations ($0.63 > r > 0.47$) when examining the respective overall, RRB, and social-communication severity scores across measures (Figure 1). In contrast, ADOS scores showed considerably weaker associations with the three other (parent-report based) measures, especially with parent questionnaires ($0.26 > r > 0.04$). The factor analysis demonstrated that models with one latent factor that includes all measures showed the best fit to the data, for overall, RRB, and social-communication severity. Factor loadings, however, differed across measures (Table 1). Loadings for the ADI, SRS and RBS-R ranged from medium-to-high while loadings for the ADOS remained low across models. This demonstrated that most of the variance in ADOS scores cannot be explained by a common factor for autism symptoms.

Conclusions: Common measures for autism symptoms can yield different severity levels for the same child. Such gaps could result from methodological differences, i.e., relying on parent report / questionnaires vs clinician observation. Alternatively, they may capture real-world differences in how autism symptoms present (and measure) in various contexts, i.e., an assessment situation vs the home environment. It is essential to understand differences in the evaluation of autism symptoms using various standardized measures and how this impacts research and clinical work.



411.180 Evaluation of the Convergent Validity and Clinical Utility of the Social Communication Questionnaire–Lifetime (SCQ-L) in an Early Assessment Sample

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Background: Early identification of autism spectrum disorder (ASD) is critical for effective treatment planning and timely intervention, which is linked to enhanced social, cognitive, and language development outcomes (Kasari et al., 2012.; Whitehouse et al., 2021). Despite these benefits, current assessment methods for identifying ASD can be time-consuming and require extensive training, which may delay access to early intervention. Thus, it is important to identify psychometrically robust tools for the early detection of ASD. The Social Communication Questionnaire–Lifetime (SCQ-L; Berument et al., 1999; Rutter et al., 2003) is a brief, caregiver questionnaire based on the Autism Diagnostic Interview–Revised (ADI-R; Le Couteur et al., 1989) and is one of the most widely-used tools to screen for ASD in clinical settings (Barnad-Brak et al., 2016). Although some studies have shown that the SCQ-L total score had positive correlations with gold-standard autism assessments, such as the Autism Diagnostic Observation Schedule, Second Edition (ADOS-2; Chandler et al., 2007, Corsello et al., 2007), more research is needed to understand the relationship between caregiver-reported symptoms of ASD and clinician-rated symptoms of ASD. In particular, research is warranted to determine if the SCQ-L is a valid screening tool for toddlers and young children with neurodevelopmental concerns.

Objectives: The purpose of the present study is to evaluate the convergent validity between the SCQ-L, a caregiver-reported screening tool, and the ADOS-2, a clinician-administered assessment measure. More specifically, convergent validity between the SCQ-L total score and subscale scores (i.e., Reciprocal Social Interaction, Communication, Stereotyped Patterns of Behavior) and the ADOS-2 overall score and subscale scores (i.e., Social Affect, Restricted and Repetitive Behavior) will be examined to investigate the relationship between these two measures.

Methods: Partial correlation analyses, while controlling for demographic variables (e.g., age, gender), will be used to examine convergent validity between the SCQ-L and ADOS-2. Secondary analysis will investigate differences in SCQ-L total and subscale scores between diagnostic groups (i.e., ASD group and non-ASD group).

Results: The study sample included 470 children between the ages of 2 and 6 years ($M = 4.55$, $SD = 1.88$, range = 2.23-6.98) who were referred to an outpatient autism clinic at a pediatric hospital. Caregivers of all participants completed the SCQ-L as part of the intake process. Of this sample, some participants completed a comprehensive diagnostic evaluation to assess for ASD and were administered the ADOS-2. Diagnoses included, but were not limited to, ASD, global developmental delay, intellectual developmental disorder, language disorder, unspecified neurodevelopmental disorder, and/or attention-deficit/hyperactive disorder.

Conclusions: Data collection and analysis are currently underway to evaluate the convergent validity between the caregiver-reported SCQ-L and the clinician-rated ADOS-2 for assessing ASD symptoms. If weak convergent validity is found, this finding may have implications regarding differences between caregivers' perception of ASD symptoms and ASD symptom severity. If strong convergent validity is found, this finding may further support the use of SCQ-L as a time- and cost-effective screening tool for toddlers and young children with neurodevelopmental concerns. Study results and implications for clinical practice will be discussed further.

411.181 Examination of Novel Short Forms of WISC-V Among a Clinical Sample of Children with Neurodevelopmental Disabilities

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Background: Assessing intellectual ability is an essential feature of diagnosis and treatment, especially among children with neurodevelopmental disorders like Autism Spectrum Disorder (ASD) and Intellectual Developmental Disorder (IDD; Hristova et al., 2017; Ozonoff et al., 2017). Over one-third of children with ASD also have an intellectual disability (Charman et al., 2010; Maenner et al., 2023) while many children with ASD have above-average intelligence. Assessment of intellectual ability ultimately aids in understanding a child and identifying appropriate supports. The Wechsler Intelligence Scale for Children (WISC) is the most common measure of intellectual ability for children (Egeland et al., 2016; Rabin et al., 2016). The WISC requires over an hour to administer (Wechsler, 2014). Children with ASD and other neurodevelopmental disabilities often have behavior regulation difficulties, and testing can be complicated by task avoidance, inattention, hyperactivity, and general testing fatigue (Matson & Nebel-Schwalm, 2005). For this reason, rapid cognitive assessments are preferred among clinicians for the ASD population (Coolican et al., 2008). Brief assessment of intelligence, and specifically brief versions of the widely used WISC-V, can facilitate efficient assessment.

Few studies have examined the validity of WISC-V short forms. Lace et al. (2022) examined a total of ten 5-subtest and 4-subtest short forms among a sample of 268 children and adolescents referred for psychological assessment. Various four-subtest short forms were found to be valid. Specifically, 65 - 70% of regression-based estimates and 69–76% of prorated estimates were within 5 Standard Score points of FSIQ. Other research has demonstrated valid four-subtest WISC short forms, including Spanish WISC-IV short forms (Dasi et al., 2014), among children with Epilepsy (Hrabok et al., 2014), and gifted children (Aubry & Bourdin, 2018). Since there may be differences in the validity of IQ tests in autistic individuals (Stephenson et al., 2021), investigation of a short-form of the WISC-V in neurodevelopmental conditions is needed.

Objectives: Examine short forms of the WISC-V compared to the FSIQ.

Methods: The sample includes 727 children referred for developmental assessments between 2010 and 2023 within a large pediatric hospital (78% male; 77% White, 11% Black, 7% Multiracial, 2% Hispanic/Latino; Mage=10.8 years, SDage=2.8 years). Following Aubry and Bourdin (2018), 11 4-subtest short forms were calculated using linear regression. Composite reliability coefficient (Aubry & Bourdin, 2018; Tellegen & Briggs, 1967) and corrected correlation coefficients were calculated (Aubry & Bourdin, 2018; Girard & Christensen, 2008) based on reliability and inter-correlations published in the WISC-V manual (Wechsler, 2016).

Results: All 11 short forms had high reliability and were significantly correlated to the FSIQ. Reliability estimates ranged from $r_{cc} = .94-.96$. The highest-performing short form included Vocabulary, Matrix Reasoning, Figure Weights, and Digit Span subtests, and had a strong relationship to FSIQ ($r' = .93$, $p < .01$).

Conclusions: The results indicate that short forms of the WISC-V may have high utility among children referred for developmental assessments. Regardless of the four-subtest combination, short-form scores are similar to FSIQ scores. Future research is needed to determine external validity of short forms, including how they may compare to other cognitive tests and long-term outcomes.

411.182 Examining the Relationship between Symptom Severity and Adaptive Functioning in Children and Adolescents with Autism

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Background:

Research exploring the relationship between autism symptom severity and adaptive behavior has been mixed. Some studies indicate a weak relationship between constructs (e.g., Kanne et al., 2011); others (e.g., Perry et al., 2009) show a strong negative relationship. While clinical descriptions often emphasize symptom severity, understanding adaptive functioning may be equally important for characterizing individual differences, strengths, and support needs.

This understanding becomes even more crucial as children face different challenges across development. Age may also influence severity and adaptive skills, but few studies have included samples spanning across age ranges. Most focus on narrow age bands (e.g., 2-4 years old: Szatmari et al., 2015), thus limiting our developmental understanding of this relationship.

Objectives:

Examine the relation between autism symptom severity and adaptive skills in a large sample of children and adolescents, across a range of severity levels, language ability, and ages.

Methods:

This study uses secondary data from SFARI, a clearinghouse of autism research data. Data was combined from the Simons Simplex Collection, SPARK dataset, and Autism Inpatient Collection. Participants with assessments completed across primary measures were included ($n=1942$).

The following variables were analyzed:

- (1) Autism severity: Calibrated Severity Scores from the ADOS-2 (clinician-rated observational diagnostic assessment)
- (2) Language level: Based on ADOS-2 module administered (preverbal/single words, phrase speech, and verbally fluent)
- (3) Adaptive behavior: Total Adaptive Behavior Composites from the Vineland Adaptive Behavior Scales (parent-rated questionnaire)

Results:

Correlations indicated adaptive behavior and autism symptom severity were weakly related overall ($r=-.127$, $p<.001$) and across language levels (preverbal/single words: $r=-.141$, $p=.008$, $n=356$; phrase speech: $r=-.267$, $p<.001$, $n=461$; verbally fluent: $r=-.100$, $p<.001$, $n=1125$).

ANOVA indicated age was associated with lower adaptive behavior scores ($B=-1.78$, $p<.001$), while accounting for severity and language ($F=428.119$; $p<.001$).

Conclusions:

This study builds on previous work by not only increasing sample size, but also by including children and adolescents across ages and language abilities to more broadly represent the autism spectrum. Results confirm a weak relationship between autism symptom severity and adaptive behavior across language ability, suggesting they are related yet distinct factors. Findings also support previous work indicating a negative association between age and adaptive behavior, regardless of severity or language level.

These results suggest that interventions focusing solely on reducing autism symptoms may not necessarily translate to improved adaptive outcomes. This reflects a broader shift toward supporting independence and quality of life in autistic individuals and their families, rather than focusing on symptom reduction alone. While autism is often characterized by symptom severity and language ability, these findings emphasize the importance of considering the whole person and their participation in daily life, which may be better captured through measures of adaptive behavior and well-being.

411.183 Exploring Clinician-Caregiver Discrepancy in Diagnostic Assessment: Results from a Community Sample

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Background: Best practices in autism assessment encourage clinicians to consider children's behavior across a variety of contexts. Thus, clinicians often rely on caregiver report to support diagnostic conclusions. However, it is possible that caregivers and clinicians may provide discrepant assessment data, with emerging research identifying demographic factors (e.g., socioeconomic status, child race, child sex), age at diagnosis, and amount of intervention received as key factors associated with informant discrepancies. Notably, most research examining informant discrepancies has drawn on samples of children with preexisting autism diagnoses. However, discrepant reports from informants can reflect meaningful information about symptom presentations across settings and clinical trajectories. As such, informant discrepancy may be implicated in diagnosis and treatment planning. Understanding factors associated with clinician-caregiver informant discrepancies in a diagnostic setting may support clinical decision-making.

Objectives: This study expands on existing research by investigating the relationship between clinician-caregiver discrepancies in ratings of autism characteristics and various child (age, sex, race, ethnicity, adaptive functioning) and family factors (caregiver stress, socioeconomic status).

Methods: Participants were 52 children (M age = 6 years) presenting to a grant-funded, community-based autism diagnostic program in a Southern state. Caregivers completed a demographic questionnaire, the Perceived Stress Scale, the Vineland Adaptive Behavior Scales, and the Social Responsiveness Scale (SRS-2) as a part of their child's intake. Children were assessed with the Childhood Autism Rating Scale (CARS-2) as a part of their evaluation.

Results: A clinician-caregiver informant discrepancy score was derived by calculating a standardized difference score from clinician CARS-2 ratings and caregiver SRS-2 ratings. Wilcoxon rank-sum tests were conducted to examine clinician-caregiver discrepancy scores by child sex and insurance status (i.e., private insurance or Medicaid) as a proxy of socioeconomic status. Bivariate correlations were used to assess the relation between discrepancy score and child age, race, ethnicity, adaptive functioning, and caregiver perceived stress. Clinician-caregiver discrepancy was not significantly associated with child sex ($W = 101$, $p = 0.99$), insurance status ($W = 226$, $p = 0.48$), age ($r(43) = .18$, $p = 0.40$), or race and ethnicity ($r(43) = 0.08$, $p = 0.62$; $W = 205$, $p = 0.29$). Child adaptive functioning ($r(42) = -0.29$, $p = .05$) and caregiver perceived stress ($r(30) = -0.47$, $p = .008$) were negatively associated with clinician-caregiver discrepancy.

Conclusions: Findings suggest that higher clinician ratings of autism characteristics, relative to caregiver ratings, were associated with lower child adaptive functioning. Higher caregiver relative to clinician ratings were linked to higher caregiver stress. Previous research has generally treated adaptive functioning and autism characteristics as distinct clinical constructs, but adaptive functioning difficulties may overshadow autism characteristics for some caregivers resulting in lower relative caregiver ratings. Caregiver stress may also shape caregiver perceptions of symptom severity among families presenting for a diagnostic assessment. Data collection is ongoing, and the current small, predominantly male ($n = 46$) sample limits generalizability. Further assessment of clinician-caregiver discrepancy is needed as data collection continues.

411.184 Exploring Phenotypic and Sociodemographic Influences on Cognitive-Adaptive Functioning Discrepancies in Neurodivergent Children

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Background: Neurodevelopmental conditions, including autism, attention-deficit/hyperactivity disorder (ADHD), and obsessive-compulsive disorder (OCD), are associated with significant variation in cognitive and adaptive functioning. In the general population, adaptive functioning generally increases with cognitive abilities. However, this relation is more complex when observed across neurotypical and neurodivergent individuals, with a significant gap between cognitive and adaptive functioning. Specific concerns of adaptive functioning being significantly lower than cognitive abilities, mainly studied in the autism population with or without intellectual disabilities, can be observed in other neurodevelopmental conditions. Less is written about the correlates of this cognitive-adaptive functioning discrepancy in neurodivergent children. The present study addresses this research gap by characterizing the features that are most predictive of these discrepancies.

Objectives: This study aimed to characterize the phenotypic and sociodemographic predictors of cognitive-adaptive functioning discrepancy in a neurodiverse sample of children and adolescents.

Methods: The study used data from the Province of Ontario Neurodevelopmental Network (POND), comprising 902 participants (autism = 409, ADHD = 210, OCD = 36, neurotypical = 214, other = 33) aged 6-21 years. Cognitive functioning was measured with full-scale IQ (FSIQ) from the Wechsler family of tests, and adaptive functioning was measured with the Adaptive Behavior Assessment System-II (ABAS-II), specifically the General Adaptive Composite (GAC) score. The cognitive-adaptive functioning discrepancy was calculated as the difference between FSIQ and ABAS-II GAC scores. Phenotypic measures included social communication (Social Communication Questionnaire, or SCQ), ADHD symptoms (Strengths and Weaknesses of ADHD Symptoms and Normal Behavior Scale, or SWAN), OCD symptoms (Toronto Obsessive-Compulsive Scale, or TOCS), and mental health symptoms (Child Behavior Checklist, or CBCL). Sociodemographic data encompassed sex, age, race, household income, and caregiver education. Nine computational models were used to predict the cognitive-adaptive functioning discrepancy. SHapley Additive exPlanations (SHAP) analysis was used to interpret the contributions of individual features to the cognitive-adaptive functioning discrepancy predictions.

Results: The random forest model achieved the highest predictive accuracy ($R^2 = 0.876$, $p < 0.001$), outperforming other models with a mean absolute error of 4.14. SHAP analysis showed that FSIQ, SCQ, and inattentive traits were the most influential predictors of cognitive-adaptive functioning discrepancy. Higher FSIQ ($FSIQ \geq 100$) was associated with increased cognitive-adaptive functioning discrepancy across all groups, while social communication differences ($SCQ \geq 10$) and inattentive traits ($SWAN \geq 3$) were also associated with increased cognitive-adaptive discrepancy. Sociodemographic factors had smaller but still significant effects, with sex ($p < 0.001$) and age ($p < 0.001$) influencing cognitive-adaptive functioning discrepancy (male sex and younger age decreased the cognitive-adaptive functioning discrepancy).

Conclusions: The analysis demonstrated that cognitive abilities, social-communication differences, and inattentive traits are key drivers of cognitive-adaptive functioning discrepancies in neurodivergent children. This knowledge can inform clinical practice by guiding design of individualized support strategies to enhance adaptive functioning.

411.185 Exploring the Characteristics of Autistic Children with Discrepant Executive Functioning Reports and the Frequency in Which Discrepancies Occur between Teachers and Parents

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Background: Executive function (EF) is linked to better outcomes for autistic children and likely contributes to heterogeneity in autistic traits, anxiety, and adaptive functioning. As children's EF and associated traits may present differently at school versus home, parent-teacher reports may not align. Nonetheless, data are limited on the frequency and associated characteristics of EF informant discrepancies in autistic children.

Objectives: Describe discrepancy in informant classifications of EF challenges and associated clinical characteristics in autistic preadolescents.

Methods: Participants were 210 preadolescents (85% male, $M[SD]_{Age}=8.08[0.54]$ years; $M[SD]_{IQ}=85.16[19.56]$) from the *Pathways* study, a longitudinal study of Canadian autistic youth, with concurrent parent- and teacher-reported Behavior Rating Inventory of Executive Function (BRIEF) at the earliest time point available between 7.5-11 years. Parent- and teacher-reported Social Responsiveness Scale (SRS), Vineland Adaptive Behavior Scales Second Edition (VABS-II; Adaptive Behavior Composite) and Child Behaviour Checklist (CBCL; Anxiety Problems) from that time point were also analyzed, along with IQ assessments (at 8.5-9 years) and Autism Diagnostic Observation Schedule (ADOS) severity scores (at 6.5-7 years). We categorized children as having elevated EF challenges (Global T score > 60) or not on both the parent- and teacher-reported BRIEF. Clinical characteristics were compared across groups via ANCOVAs (controlling for age) followed by Tukey post-hoc analyses with Holm-Bonferroni corrections.

Results: Inter-rater agreement between parents' and teachers' BRIEF reports was weak overall ($\kappa=.25$). 38% of children ($n=80$; $M[SD]_{Diff}=0.73[8.81]$) were above clinical cut-offs on both parent and teacher BRIEF and 25% ($n=53$; $M[SD]_{Diff}=2.33[7.14]$) below on both. Twenty-three percent ($n=49$; $M[SD]_{Diff}=15.51[8.91]$) were elevated on teacher BRIEF only and 13% ($n=28$; $M[SD]_{Diff}=14.00[7.08]$) on parent BRIEF only. Children who informants consistently identified as above clinical cut-offs had higher autistic traits (per SRS and ADOS) and anxiety, and lower adaptive functioning and IQ ($p<.01$). Comparing discrepancy groups, parent-rated autistic traits ($p=.01$) and anxiety ($p=.02$) were significantly greater for children whose parents (but not teachers) reported elevated EF (partial $\eta^2=.40$ and $.15$, respectively). By contrast, autistic traits (per ADOS [$p=.03$] and teacher-SRS [$p<.001$]) were rated significantly higher in children whose teachers (but not parents) reported elevated EF (partial $\eta^2=.09$ and $.31$, respectively). Discrepancy groups did not differ in adaptive functioning, teacher-rated anxiety, or IQ.

Conclusions: For most children, EF was consistently classified as elevated (or not) by parents and teachers. Children whom informants consistently identified as elevated in EF challenges were more symptomatic across mental health and IQ measures than discrepant or consistently non-elevated children. Notably, 37% of classifications were discrepant, with mean t-score differences of ~ 1.5 SD. Within this group, teacher (but not parent-rated) EF elevations were more common than vice versa and were associated with greater clinician-rated autistic traits (via ADOS). For this subgroup, school may pose particular EF-related behavior challenges, some of which may also be captured by or related to behavior assessed in the ADOS (e.g., behavioral flexibility or regulation differences affecting social reciprocity). Examining whether discrepancy patterns hold overtime may clarify the presence of consistent behavioral differences across contexts and inform context-specific supports.



411.186 Factor Structure of the Rosenberg Self-Esteem Scale in Youth with Autism Spectrum Disorder: Exploratory Factor

Analyses of Youth Self-Report Ratings and Parent Ratings

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Background: The Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965) is one of the most widely used measures of self-esteem in the world. It was originally intended to provide an overall score that reflects the global self-esteem construct (Rosenberg, 1965; Schmitt & Allik, 2005).

However, past RSES factor-analytic studies yielded mixed findings, as some studies produced the intended one-factor solution, while others produced a two-factor solution—with positively worded items on one factor and negatively worded items on the other. The RSES is typically used as a self-report measure of global self-esteem. However, when evaluating youth with autism spectrum disorder (ASD), some researchers have used both the standard self-report form for youth with ASD and a modified version of the RSES adapted to allow the parent to rate their child (e.g., see Van der Crujisen & Boyer, 2020).

Objectives: The purpose of the present study was to examine, via exploratory factor analyses (EFAs), the factor structure of the RSES for self-ratings of youth with ASD and for parent ratings of the youth with ASD. Although multiple EFAs and confirmatory factor analyses (CFAs) of the RSES exist in the literature, and despite the RSES having been used as a dependent measure in ASD studies (Van der Crujisen & Boyer, 2020), no prior factor analyses of the RSES with ASD samples have been reported.

Methods: Participants included 140 youth with ASD and their parents whose data were collected during the pretest period of three prior clinical intervention studies. Youth participants were all diagnosed with ASD and ranged in age from 7 to 16 years ($M=11.26$, $SD=2.15$); IQ $M=103.89$, $SD=13.67$; receptive language composite $M=97.71$, $SD=14.64$; and expressive language composite $M=102.56$, $SD=16.30$. Two forms of the RSES were examined—the original 10-item self-report rating form and the adapted 10-item parent-rating form. For each version, an EFA of the inter-item polychoric correlation matrix was performed using principal axis factoring with direct oblimin rotation. Number of factors retained was determined through a combination of parallel analysis, Velicer's MAP, Kaiser criterion, scree plot, and factor interpretability.

Results: EFAs yielded a single factor solution for the RSES parent rating form—consistent with the global self-esteem construct, and a two-factor solution for the youth self-report—consistent with two correlated method factors reflecting self-esteem assessed via positive or negative wording. Youth self-report results also revealed that items 1 and 8 were problematic, as they failed to load on either factor and their distributions and item content suggested likely confusion among youth respondents.

Conclusions: EFA results yielded a retained single-factor solution for the RSES parent report form, and a correlated two-factor solution for the youth self-report form. The two-factor solution appeared to reflect a method artifact—with positively worded items on one factor and negatively worded items on the other. Items 1 and 8 were problematic in the child self-rating context and should likely be dropped from the instrument or considered for revision or replacement.

411.188 Factors Associated with Teacher Social Responsiveness Scale (SRS): Age, Sex, and Challenging Behaviors

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Background: Diagnosing autism is a complex process. Currently, autism diagnosis involves a parent interview and a standardized clinical observation of the child. Most often used are the Autism Diagnostic Interview-Revised (ADI-R; Lord et al., 1994) and the Autism Diagnostic Observation Schedule (ADOS-2; Lord et al., 2012). Yet, these measures are often time-consuming within educational settings and require trained clinicians to administer. As a result, screeners like the Social Responsiveness Scale, 2nd edition (SRS-2; Constantino & Gruber, 2012) are frequently employed to identify children for further in-depth assessment. Although the SRS-2 can be completed by multiple raters, such as parents and teachers, few studies have examined factors associated with teachers' ratings on the SRS-2.

Objectives: This study examines factors associated with teachers ratings on the SRS. Specifically, this study examines whether age, sex, and challenging behaviors, as measured by the Child Behavior Checklist - Teacher Rating Form (CBCL-TRF; Achenbach & Rescorla, 2001), are associated with total SRS-2 scores.

Methods: Participants were recruited as part of a larger 4-year IES-funded study examining teacher-student interactions among neurodiverse students in general education classrooms (R324A210288). This current study pulled data from year 3 of the larger study. Participants included 44 autistic ($n = 20$) and non-autistic ($n = 22$) students from Kindergarten to 3rd grade in inclusive general education classrooms. 13 teachers completed the SRS-2 ($n = 44$) and the CBCL-TRF ($n = 37$) on their students at the beginning of the school year. Bivariate Pearson correlations were conducted to examine associations between SRS-2 scores, chronological age, sex, and CBCL-TRF scores (Internalizing and Externalizing Scale scores). Linear regressions were conducted to examine the amount of variance contributed by additional variables.

Results: SRS-2 scores were significantly correlated with CBCL-TRF externalizing behaviors ($r = .58, p < .001$) and chronological age ($r = -.35, p = .02$) but not with CBCL-TRF internalizing behaviors ($r = .23, p = .18$) or sex ($r = -.13, p = .40$). Linear regressions showed chronological age was a significant predictor of teachers' ratings on the SRS-2 ($F(1, 35) = 4.98, p = .032$), accounting for 12.5% of the variance in teachers' ratings on the SRS-2 (adjusted $R^2 = .010$). After adding in the internalizing CBCL scores, 17.8% of the variance in teacher SRS scores were accounted for (adjusted $R^2 = 0.130$). After adding in the externalizing CBCL scores, 37.1% of the variance in teacher SRS scores were accounted for (adjusted $R^2 = .313$).

Conclusions: This study examines factors associated with teachers' ratings of autism symptomatology in their students in inclusive classrooms, finding that teachers report the highest autism features in younger students who have higher scores of challenging behaviors in the classroom. This study expands upon similar findings from studies examining factors associated with the parent SRS (Constantino et al., 2003; Hus et al., 2012). Future studies are needed to elucidate whether teachers are accurately perceiving autism symptomatology in their students by validating scores against clinical assessments of students' autism symptoms.

411.189 Factors Influencing Clinician Certainty in Diagnosing Autism Spectrum Disorder in Two-Year-Olds

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Background: Accurate and timely ASD diagnosis is crucial, especially for families with autistic children, as siblings have ~20% chance of also being diagnosed with ASD (Ozonoff et al., 2024). The complexity of diagnosing ASD in toddlers makes clinician certainty critical for ensuring accurate assessments. Understanding the factors that influence diagnostic certainty, and identifying potential sex and racial biases, is vital for improving assessment practices and addressing disparities in outcomes for autistic individuals. This research builds on previous studies, which have examined clinician certainty in community-referred settings (Klaiman et al., 2024) and in older children (Rødgaard et al., 2024).

Objectives: The current study explores factors influencing clinician certainty in making an ASD diagnosis in two-year-olds in prospective, longitudinal studies of infant siblings of children with ASD. We consider how demographic characteristics (sex and race), language level, and ASD features (ADOS-2 Toddler Module Calibrated Severity Scores (CSS) and individual items) influence certainty.

Methods: Participants included 109 two-year-old children who enrolled in the prospective longitudinal study prior to age 6 months ($n=64$ males, $n=45$ females; $n=70$ elevated (EL) familial ASD likelihood, $n=39$ low (LL) ASD likelihood). The sample consisted of 67 White children, 28 Black, 9 Mixed Race, 2 Asian, and 3 from unknown racial/ethnic backgrounds. At 2 years, licensed psychologists (ADOS-2 research reliable with ASD expertise) made diagnostic decisions using the clinical best-estimate procedures (Lord, et al., 2012) and rated their degree of diagnostic certainty (1-low certainty to 3-high certainty). We used multiple linear regressions to evaluate associations among sex, ADOS-2 CSS, race, and certainty in those with and without ASD. Fisher's Exact Tests and Spearman correlations were used to explore individual ADOS-2 items and certainty associations.

Results: Overall, 31% of participants ($n=18$ males; $n=16$ females) received an ASD diagnosis, and 53% of these diagnoses ($n=11$ males; $n=7$ females) were made with high certainty. Clinicians were equally confident in diagnosing and ruling out ASD ($p=.30$). Neither sex nor race was related to diagnostic certainty ($p=.54$; $p=.79$). Higher ADOS-2 CSS was moderately associated with more certainty in diagnosing ASD ($F(2,31)=5.49, p=.009$). Clinicians were less certain ruling out ASD for girls with higher RRB CSS ($F(2,69)=4.26, p=.02$; Fig. 1). Figure 2 shows specific ADOS-2 items predicting certainty. Lower language abilities (item A1 rating 3-4) correlated with a 64% increase in certainty for ASD diagnosis ($p=-.64, p=.0004$), while higher language abilities (A1 rating 0-2) correlated with an 18% increase in ruling it out ($p=.18, p=.01$), regardless of sex.

Conclusions: This study demonstrated that while sex and race do not directly influence clinician certainty in diagnosing ASD, sex plays a role in the diagnostic process, as clinicians exhibit less certainty when ruling out ASD in girls with higher RRBs. Consistent with previous studies of other ADOS-2 modules, certain items in the Toddler Module were stronger predictors of certainty, reflecting how clinicians weigh symptoms differently. As expected, lower language abilities correlated with greater certainty, indicating that children with higher language abilities are at greater risk of misdiagnosis or underdiagnosis. Addressing these factors may enhance diagnostic certainty, accuracy, and timely access to services.



411.190 Families' Implementation of Recommendations Provided in a Public Neurodevelopmental Assessment Service Whilst Awaiting Diagnostic Assessment.

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Background: One in ten children worldwide meet criteria for neurodevelopmental conditions. There is an abundance of literature to support the significance of early diagnosis and intervention, but the wait for the diagnosis can be long. In New South Wales, Australia, public assessment services have waitlists that can range from 12-36 months. As well as impacting the child's access to early intervention these extended wait times can have significant impacts on stress levels experienced by families as well as their engagement with the provided services. Researchers have proposed focusing on simultaneously referring children for intervention while they are awaiting a diagnosis, and consumers also advocate for their preference to access supports whilst awaiting diagnostic assessment for their child. Neurodevelopmental assessments are effective in educating caregivers about their child's needs, as well as providing guidance on available supports and interventions. Despite the provision of actionable recommendations aimed at improving children's developmental outcomes the extent to which recommendations are implemented by families remains under-researched.

Objectives: We sought to investigate rates of implementation of financial, therapeutic, and educational recommendations provided in a public neurodevelopmental assessment clinic while families were awaiting a multi-disciplinary diagnostic assessment, approximately 12 months later. **Methods:** The study utilized a retrospective, quantitative design. Participants included 65 families whose children had attended both intake and assessment appointments at a tertiary neurodevelopmental assessment service between 2019 and 2022. This service offers an initial intake appointment where families are given recommendations around therapy, funding, and education to implement whilst awaiting diagnostic assessment. We extracted novel recommendations provided in intake reports and compared these to follow-up recommendations made in the diagnostic assessment reports to identify the rate of uptake and implementation of initial recommendations by families. We also assessed the effect of sociodemographic variables on implementation of recommendations.

Results: From the 65 participants, 50 (76.9%) received an ASD disorder diagnosis by the end of the diagnostic assessment. All remaining participants exhibited significant developmental delays in at least two areas. There was an average waiting period of 7.3 months between intake and assessment appointments (range: 1- 18 months). Children were aged between 22 months and 5 years ($M = 3.51$ $SD = 0.94$), 69% males and 31% females. A total of 170 novel recommendations were extracted from intake reports, and 57 (33.5%) of those recommendations were implemented by families during the waiting period. Thirty-eight (58.5%) of the 65 of families were given novel recommendations at their intake appointment, with 31 (81.6%) of these families implementing at least one novel recommendation while awaiting assessment. There was no statistically significant effect of sociodemographic variables (culturally and linguistically diverse status, maternal education, child's age at intake) on rates of implementation.

Conclusions: The results of this study provide information regarding rates of implementation of recommendations by families in neurodevelopmental assessment settings. Our results indicate most families are proactive about seeking appropriate supports and services for their children. Further exploration of the challenges and experiences of families with low implementation rates may offer valuable insights for improving the support provided.

411.191 Feasibility and Acceptability of 14 Days of Ecological Momentary Assessment with Ambulatory Psychophysiology in Autistic Adults

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Background: Ecological Momentary Assessment (EMA) in combination with ambulatory psychophysiology provides insight into real-time psychophysiological changes (e.g. heart rate variability, electrodermal activity) and co-occurring self-reported subjective thoughts, feelings, and behaviors. No prior study has utilized EMA with ambulatory psychophysiology in autistic adults.

Objectives: We examined the feasibility of EMA with ambulatory psychophysiology for 14 days of data collection in an autistic adult sample. We aimed to examine feasibility and acceptability for use of ambulatory psychophysiological methods in autistic participants, including the potential association between self-reported sensory sensitivities and feasibility and acceptability.

Methods: Participants included 65 autistic and 20 non-autistic adults (M age =31.94, SD=10.08) who participated in a 14-day EMA protocol with heart rate variability (HRV) and electrodermal activity (EDA) continuous monitoring. Participants wore an electrocardiogram (ECG) sensor on their chest and EDA sensor on their ankle while responding to EMA surveys on a mobile device 8 times daily. Sensor wear compliance, physiological data quality, and EMA survey completion of the autistic adults were compared to the non-autistic adults using independent samples t-tests. Participants also completed a debriefing survey of 16 questions rated on a 5-point Likert Scale assessing physical discomfort, skin irritation, self-consciousness, impact on daily life, ease of use, and subjective feelings of stress while participating in the study. We examined bivariate correlations between the Comprehensive Autistic Trait Inventory (CATI) sensory sensitivity subscale and protocol compliance, data quality, and responses from the debriefing survey.

Results: No significant differences were found between groups for protocol compliance or data quality. Autistic adults had comparable rates of sensor wear, data quality, and EMA survey completion compared to non-autistic adults. Mean HRV compliance was 87.37% with validity of 78.17%, and mean EDA compliance was 85.57% with validity of 82.38%. Autistic adults in our sample had a higher mean subjective CATI sensory sensitivity score than non-autistic adults ($t(83) = 7.82, p < .001$). However, no significant correlation was found between CATI sensory sensitivity scores with protocol compliance (i.e., rates of sensor wear) or data quality. Debriefing questionnaire responses did not indicate excessive levels of physical discomfort from wearing the sensors. Positive correlations were observed between CATI sensory sensitivity scores and responses to debriefing questionnaire items assessing physical discomfort from sensor wear (r 's from .31 to .39, p 's $< .05$), indicating that individuals with higher self-reported sensory sensitivity report more physical discomfort from extended sensor wear. Nonetheless, compliance and data quality remained high and acceptable throughout the 14-day protocol in this autistic adult sample.

Conclusions: Our data suggest high compliance and data quality, indicating the feasibility and acceptability of EMA with ambulatory psychophysiological monitoring over the course of 14 days in autistic adults. It is important for researchers using these methods to consider sensory sensitivity and monitor participants' experiences to enhance compliance, data validity, and participant acceptability.

411.192 How Observed and Reported Measures of Sensory Processing Predict Physiological Measures in Autism Spectrum Disorder
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Background:

Sensory over-responsivity (SOR) is a heightened response to sensory stimuli commonly seen in autism spectrum disorder (ASD) and impacts daily functioning. Historically, parent-reported and observed behavioral assessments are used to study SOR, but are not correlated. This is possibly because they measure different aspects of sensory processing or because children inhibit their responses during a lab assessment. Physiological measures provide an objective measure of sensory reactivity, and atypical heart rate (HR) responses to aversive stimuli have shown to be related to SOR in ASD youth.

Objectives:

This study aimed to compare how reported and observed measures of SOR predict physiological measures of sensory reactivity, and to examine if the level of reported regulation in ASD youth affects how SOR behaviors on an observed measure correlate with physiological reactivity.

Methods:

In this study, 54 TD children and 83 ASD children completed the Sensory Processing 3-Dimensional Assessment (SP3-D); SOR responses (e.g., grimacing, clenching fists), to only auditory and tactile stimuli were measured (30-sec each of 3 brushes on arm and lips and 3 loud musical instruments). Electrocardiogram recordings, such as the change in inter-beat interval (IBI), were calculated as the difference between pre-stimulus resting IBI and IBI from ten time periods post-stimulus onset. The first 4 seconds post-stimulus onset were considered the "orientation phase," where HR typically decreases due to initial processing of the stimulus. The 4th through 10th seconds post-stimulus onset were categorized as the "acceleration" phase, when HR typically increases. Participants' parents completed the SP3-D Inventory Checklist to report on tactile and auditory SOR symptoms and the Child Behavioral Checklist (CBCL) Emotional Dysregulation Index to report on regulation.

Results:

Repeated-measures ANOVAs showed main effects of diagnosis on IBI for both auditory ($p=0.019$) and tactile ($p<0.001$) stimuli, with the ASD group having lower IBI (higher HR) across stimuli. Within the ASD group, results showed a three-way interaction between parent-reported SOR, observed SOR, and time for the tactile and auditory domains ($p=0.041$ and $p=0.002$, respectively). Post-hoc analyses indicated that ASD participants whose parents who reported they had high SOR in their daily life, and showed high observed SOR in the lab assessment, exhibited the highest HR responses (reduced orienting and increased acceleration). To follow up, we then examined the interaction between emotion dysregulation and observed SOR on HR orientation and acceleration slopes and found significant effects ($p=0.009$ and $p=0.03$, respectively). ASD participants who had higher emotion dysregulation had a stronger correlation between observed SOR behavior and atypical HR responses.

Conclusions:

This study's results support prior findings that ASD youth show higher HR responses to aversive stimuli. Furthermore, observed and parent-reported SOR interacted to predict HR, with those rated high on both measures showing the most atypical HR responses. Additionally, ASD youth reported as dysregulated by parents exhibited a stronger correlation between HR and observed SOR behaviors, indicating that observed SOR measures may be less accurate for ASD youth who are inhibiting their behavioral responses. This study illustrates how to integrate multiple measures of sensory reactivity to identify SOR in ASD youth.

411.193 Identifying Reliable Change in Outcome Assessments for Behavioral Interventions

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Background: Outcome assessments for effective behavior intervention approaches in autism spectrum disorder utilize skill-based and norm-referenced measures. Legacy outcome measures commonly-used in behavioral intervention practice often lack key information on whether client score changes are reliable.

Objectives: This study evaluated and compared three methods for determining reliable change: traditional reliable change indices (RCIs), practice-adjusted RCIs, and standardized regression-based (SRB) RCI norms, to the Neurobehavioral Evaluation Tool (NET V1.0 and V3.0) assessment data to inform future behavioral intervention outcome assessments.

Methods: Participants in the NET V1.0 sample (N=498) included individuals with neurogenetic and neurodevelopmental conditions, and their siblings, recruited through genetic syndrome foundations. Neurotypical participants were recruited through StudyKiK. NET V3.0 (N=125) parent/caregiver informants were recruited through Prolific. Informants for both versions provided demographic and health information. Clinical diagnoses were categorized into neurotypical, autism spectrum disorder (ASD), and other developmental disorders (DD). NET V1.0 included brief informant-report measures covering symptom and skill/functioning domains used in intervention studies in ASD and rare neurodevelopmental genetic syndromes. Measures featured 6 symptom and 5 skill domains, and were completed at baseline and 1-month and 4-month follow-ups. Analyses focused on sample characterization, identifying the appropriate test-retest interval and sub-sample for final norms and computed traditional RCIs, practice-adjusted RCIs, and SRB RCIs.

Results: NET V3.0 had a more diverse sample compared to NET V1.0, in terms of age, race, and ethnicity. The NET V1.0 sample had more participants with neurodevelopmental and neuropsychiatric conditions. NET V1.0 exhibited high test-retest reliability that was comparable across follow-up time points (1-month and 4-month), and NET V3.0 showed high test-retest reliability that was comparable across all sub-samples (NT, ASD, DD, ASD+DD). Mean changes were minimal across all domains in both versions Table 1. RCI norms were generated for 1-month follow-up with data combined across sub-samples. Traditional RCIs required a difference of 0.57 to 1.3 SDs from baseline to follow-up for reliable change in symptom reductions and skill improvements with minimal practice-adjustments. Baseline scores strongly predicted retest scores across all domains, highly influencing SRBs. Notably, age, speech levels, and cognitive levels were also significant predictors for selective measures. SRB RCIs tended to be slightly smaller than traditional RCIs, with similar variability across domain measures.

Conclusions: The norms presented can be used to inform and enhance behavioral interventions. Practice-adjusted RCIs may be preferred in clinical contexts, while SRBs may offer greater sensitivity to reliable change in many patients. Future research should incorporate more outcome assessment instruments to enhance the use of reliable change indices and explore the impact of other clinical factors on reliable change estimation. Additionally, it will be important to develop software with clinical decision support for easy implementation of RCIs in typical clinical practice. Provider education will be important for ensuring that reliable change indices are adopted and utilized to inform clinical management decisions.



411.194 Identifying the Unique Determinants Influencing Rural Families' Engagement with an Existing Tele-Assessment Approach for Autism Identification

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Background: Accurate identification of autism is a pressing challenge for rural, medically underserved communities. Even when diagnostic appointments become available, many multi-stressed, rural, or otherwise underserved families experience significant barriers to in-person assessment and treatment leading to disparities in age of identification and service access. Tele-assessment has potential to address these barriers, particularly for the 20% of children with developmental disabilities living in rural America and the estimated 50% of autistic children living in low-income households. Despite its promise, emerging work also highlights the potential for telemedicine to exacerbate existing care disparities for socioeconomically disadvantaged groups, particularly when approaches fail to address unique contextual factors surrounding implementation.

Objectives: This work systematically examined the factors that facilitate and hinder tele-assessment engagement (i.e., determinants) for families living in rural, medically underserved communities in order to identify targeted implementation strategies to promote equitable, sustained use.

Methods: As part of a larger ongoing state-wide initiative, we used a qualitative approach to identify factors influencing rural families' perceptions and use of tele-assessment, by interviewing caregivers of autistic children and community service providers living and working in rural, medically underserved areas in the Southeast region of the United States. As of this submission, we have interviewed 32 participants across two groups: 22 caregivers of autistic children, and 10 community providers serving autistic children or those with related disabilities (Table 1). We used author-created interview guides (structured using the Consolidated Framework for Implementation Research; CFIR) and interview transcripts to develop a hierarchical coding system. Two study authors coded all transcripts. To maintain trustworthiness throughout the coding process, another member of the study team read all transcripts and coded 50% of transcripts. An iterative inductive/deductive approach guided data analysis. Inductively, quotes were sorted by coding category to identify themes. Deductively, we were guided by the CFIR framework, the Health Belief Model, and the Social-Ecological model. We created a conceptual framework to visually present the focus group results.

Results: Preliminary data analysis reflected four core attitudes central to community perceptions, including 1) questions surrounding the validity (scientific legitimacy) of tele-mediated autism assessment; 2) level of trust in the evaluation process in general (and tele-assessment specifically); 3) beliefs about the feasibility of tele-assessment; and 4) concerns related to privacy. These attitudes and beliefs are influenced by determinants at multiple levels (child, family, system) and stages (e.g., referral, diagnostic visit), highlighting the need to adapt the existing tele-assessment approach by embedding implementation strategies that support multiple actors at each stage. As additional focus groups are conducted, our conceptual framework will be revised to incorporate new perspectives with specific focus on gathering additional input from linguistically, geographically, and socioeconomically diverse shareholders.

Conclusions: This work identifies important targets for ensuring equitable access to successful tele-assessment for rural families. Understanding and alleviating care disparities related to tele-assessment could fuel future health services research that seeks to understand telehealth appropriateness for diverse communities and disciplines.



411.195 Interpretation of Cognitive and Adaptive Traits in Individuals with Neurodevelopmental Conditions: A Comprehensive Assessment

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Background: To create appropriate, individualized support systems for individuals with neurodevelopmental conditions, whether diagnosed or not, comprehensive assessment using various tools is essential. While intelligence tests are commonly used, the assessment of adaptive behaviors should also be included, given the need to plan for social independence across all life stages. Cognitive and adaptive profiles should be central to these assessments, combining formal and informal tools tailored to individual needs.

Objectives: This study examined the relationship between cognitive and adaptive profiles in individuals with neurodevelopmental conditions through comprehensive assessment.

Methods: Eighty-one individuals from Japan, aged 4:1 to 42:6 ($M = 12:11$), participated in the study. All had full-scale IQ scores above 70 ($M = 94.27$). Each participant completed the Wechsler Intelligence Scales and Vineland-II Adaptive Behavior Scales (VABS-II), both translated and re-standardized for use in Japan. Analyses were conducted to examine the relationship between cognitive and adaptive traits.

Results: Correlation analysis showed that all VABS-II indexes were significantly negatively correlated with age (see Table 1). VABS-II Communication was significantly positively correlated with Wechsler FSIQ ($r = .40$, $p < .001$) and VCI ($r = .31$, $p = .008$). Among Communication subdomains, only Reading ($r = .44$, $p < .001$) showed a moderate correlation with VCI.

Participants were divided into four groups based on their VABS-II Adaptive Behavior Composite (VABS-II ABC) scores (see Table 2). One-way ANOVAs found no significant differences in FSIQ or VCI across the groups, but there were significant differences in all VABS-II domains: Communication ($F(3,77) = 73.83$, $p < .001$, $G\eta^2 = .74$), Daily Living Skills ($F(3,77) = 64.04$, $p < .001$, $G\eta^2 = .71$), and Socialization ($F(3,77) = 36.24$, $p < .001$, $G\eta^2 = .56$). Post-hoc analyses revealed that lower VABS-II ABC levels corresponded with lower scores in these domains.

Significant differences were also found in maladaptive behavior: Maladaptive Behavior Index ($F(3,76) = 10.67$, $p < .001$, $G\eta^2 = .3$), Internalizing ($F(3,76) = 6.78$, $p < .001$, $G\eta^2 = .21$), and Externalizing ($F(3,76) = 7.25$, $p < .001$, $G\eta^2 = .22$). Maladaptive Behavior Index and Externalizing scores were higher in groups with VABS-II ABC scores below 70, while Internalizing scores were higher in the group with VABS-II ABC scores of 85 or above.

Conclusions: The study provides insights into cognitive and adaptive traits in individuals with neurodevelopmental conditions. The negative correlation between age and VABS-II indexes suggests that adaptive skills may not develop with age. Although verbal cognitive ability and communication were positively correlated, the moderate to high correlations observed in previous studies were not found here, indicating a distinction between cognitive ability and daily communication. Lastly, an overall adaptive level of -2 SD below the mean may indicate a higher risk for maladaptive behaviors in this population.

**411.196** The Initial Report in Evaluating Autism Traits and Unusual Sensory Processing Profile in a Menopausal Autistic Woman Using the Autism Clinical Interview for Adults (ACIA) and Self-Reported Pre-Interview Questionnaires

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Background: The hormonal changes of menopause present an emotional rollercoaster of particular significance for autistic women and other neurodivergent populations (Moseley et al. 2021; Rynkiewicz et al. 2024). Quantitative data suggest that autistic women experience more severe menopausal symptoms (Groenman et al. 2022; Rynkiewicz et al. 2023), and qualitative reports describe a breakdown in established coping skills, which can result in loss of employment, self-care and independent living skills, and can also be accompanied by dramatic increases in self-harm and suicidal behavior (Moseley et al. 2021; Rynkiewicz et al. 2024). There is still lack of reliable, valid, and appropriate diagnostic instruments for autistic adults (Wigham et al. 2020) and many women with this condition only get diagnosed often following a string of misdiagnoses (Rynkiewicz 2016; Kentrou et al. 2021). Autistic menopausal women may not be getting appropriate management and treatment for both symptoms of menopause or other physical and mental conditions.

Objectives: to evaluate the autism traits, unusual sensory processing and other symptoms in a menopausal autistic woman with hormone replacement therapy based on the semistructured interviews and self-reported questionnaires.

Methods: one case of the larger study on menopause in autism is presented. This is a white autistic person, assigned female at birth, identifying as a woman, with no intellectual disability (ID), diagnosed with ASD, with hormone replacement therapy (HRT). The case is ECHO Autism didactics. The Autism Clinical Interview for Adults (ACIA), an instrument still being assessed of its diagnostic utility and the standardized ADI-R, both from available and competent parent, ADOS-2 (Module 4) and self-reported questionnaires: Adolescent/Adult Sensory Profile (AASP), GQ-ASC/Q-ASC (Girls' Questionnaire for ASC) for adult women, Menopause-Specific Quality of Life (MENQOL) Questionnaire were used. The study was approved by the URBC (№ 2024/02/007) with patient informed consent. The researchers were formally trained on ACIA.

Results: ACIA identified autism traits relevant for a diagnosis, as well as the co-occurring conditions (e.g., anxiety in this patient) and supported the ADI-R scores. It confirmed the pattern of sociocommunicative and cognitive differences characteristic of autism, with clear evidence of unusual sensory interests albeit no self-injurious behaviour. The GQ-ASC demonstrated significant oversensitivity in touch and sound, and attempts to camouflage the autistic traits. The AASP results showed sensory processing profile of increased sensory sensitivity with sensation avoiding. Low registration and sensation seeking were in the average ranges, with a slight decrease for sensation seeking. The highest results in AASP were obtained for auditory and visual processing. The MENQOL results are presented in Table 1.

Conclusions: ACIA supported the ADI-R scores. It informed and enhanced diagnostic decision-making and treatment planning. The interplay with sensory processing and modulation worsen the menopausal symptoms and made daily functioning more difficult for this woman. The studies on small samples and even individual cases despite their limitations are worth reporting to increase knowledge on menopausal autistic people as the research of this area is still scarce. Our further research concerns higher number of autistic people with menopause.



411.197 Useful Factors in Determining an Adult Autism Diagnosis

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Background: Despite adults seeking evaluations at increasingly high rates, there are no established guidelines for adult autism diagnostic evaluations (Underwood et al., 2021). The best practice autism evaluation methods used with children are often impossible (e.g., deceased or otherwise unavailable caregivers to provide early history) or inaccessible (e.g., long wait times, limited insurance coverage, lack of clinicians with expertise in late diagnosis). Empirically investigating which factors are most influential in diagnosing autism is crucial to ethically and soundly meet the service needs of the increasing number of adults seeking evaluations for autism.

Objectives: To address the lack of available literature and contribute to studies on best practices in adult autism diagnosis, the present study uses an exploratory factor analysis on an autism diagnostic tools to create factors that can be used in determining a diagnosis of autism. Then, utilizing a stepwise regression, factors are analyzed to explore which factors are most strongly associated with an autism diagnosis. As this is an exploratory study, no hypotheses about specific factors are made. However, it is hypothesized that distinct factors will emerge and that some factors may be more useful than others in predicting an ultimate diagnosis of autism in adults.

Methods: Data from 100 adult autism diagnosis cases from varying demographic backgrounds have been completely collected, 75% diagnosed with autism and 25% not diagnosed with autism. The participants were age 18 - 60 (mean age of 26) and were diverse in race, ethnicity, and gender. Data collection is complete, but has not yet been analyzed. An exploratory factor analysis of the SRS-2, SCQ, and ratings from a structured clinical interview will be performed utilizing MPlus to identify factors relating to diagnosis. Then, a multiple linear regression (or stepwise regression) will be run to subsequently determine which factors most strongly predict a diagnosis.

Results: Data collection is complete, but analyses are unable to occur until after abstract submission. Results will discuss: (a) descriptive statistics of the population sample, (b) effect size, (c) power, (d) the distinct statistically significant factors that emerged from the exploratory factor analysis, (e) factors which most strongly predict or relate to an autism diagnosis in adults.

Conclusions: Multiple data sources will continue to be important in diagnostic evaluations, and much research on collateral report and collateral measurement is still needed. However, as these sources of data are often difficult to obtain in an adult assessment, more research is needed to better understand the self-report tools available. The identification of distinct and meaningful factors found by analyzing the SRS-2, SCQ, and ratings from a structured clinical interview and subsequently measuring their relative importance in the diagnosis of adult autism, can offer unique diagnostic information that is empirically sound to help improve and standardize adult autism diagnostic procedures. Specific implications based on the unique factors and their predictive power for researchers, clinicians, the autistic community, and other stakeholders will be discussed. Limitations and future research will be discussed.

411.198 Predictors of First-Time Adolescent Autism Diagnosis in a Clinical Sample

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Background: Late autism diagnosis is associated with co-occurring mental health and social challenges, which may worsen over time (Mandy et al., 2022). Simultaneously, co-occurring psychiatric symptoms may complicate differential diagnosis of autism in older children and adolescents (Duvall et al., 2024). Other characteristics may also contribute to late or complex autism diagnosis, including female sex assigned at birth and higher cognitive skills (Harrop et al., 2024; Hosozawa et al., 2020). In the context of high wait times for autism diagnostic evaluations, identifying factors that predict first-time adolescent autism diagnosis may inform triage models and improve access (Kanne & Bishop, 2021).

Objectives: To identify predictors of first-time autism diagnosis in adolescents presenting for an autism evaluation.

Methods: Participants were 56 individuals ages 13-17 years (mean age = 14 years, 29% female, 69% meeting criteria for autism) presenting for a first-time autism evaluation at an academic medical center. A referral from a medical provider was required for evaluation. All patients completed a diagnostic evaluation including the Autism Diagnostic Observation Schedule-2 (ADOS-2). Additional assessments typically included caregiver reported measures of adaptive skills (Vineland-3), autistic behaviors (BASC-3 Autism Probability Index), and emotional/behavioral problems (BASC-3 Internalizing and Externalizing Indices) as well as an appropriate cognitive measure. Chi-square and *t*-tests were used to identify predictors of autism diagnosis, and an exploratory logistic regression predicting autism diagnosis was conducted with variables potentially available prior to in-person autism assessment: age, sex assigned at birth, adaptive skills, caregiver ratings of internalizing, externalizing, and autistic behaviors, and diagnosis of intellectual disability.

Results: Participants diagnosed with autism had higher adaptive skills ($t(47) = -2.82, p = .003$) and ADOS-2 calibrated severity scores (CSS; $t(23.74) = -1.81, p = .04$) than participants who did not receive a diagnosis of autism. Other factors (age, sex, IQ, behavior problems, caregiver-rated autistic behaviors) did not significantly differ between diagnostic groups. In the logistic regression, while multiple factors approached significance (age, sex, adaptive skills, caregiver-rated autistic behaviors, and intellectual disability diagnosis), no single variable significantly predicted autism diagnostic outcome. The overall analysis predicted 73% of the variance in autism diagnosis (Nagelkerke R square) and had high sensitivity (96.3%) with adequate specificity (77.8%). Addition of ADOS-2 CSS to the model correctly classified all participants (sensitivity and specificity = 100%).

Conclusions: Results indicate that information gathered prior to in-person autism assessment, such as demographic factors, previous diagnoses, and caregiver ratings, could potentially be used to identify adolescents who are likely to meet criteria for autism. Adolescents with very low adaptive skills and no previous autism diagnosis may have alternate explanations for differences in social communication, such as intellectual disability or psychiatric diagnoses. However, the high rate of first-time autism diagnosis in this sample as well as reduced specificity of the overall model highlight the importance of timely access to autism evaluation for adolescents with clinical suspicion of autism.

Poster Session

412 - Genetics I

May 1st, 2025, 5:30 PM - 6:30 PM - Hall 4A

412.200 Autism-Relevant Skills and Behaviors in Angelman and Dup15q Syndromes

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Background:

Angelman syndrome (AS) and Dup15q syndrome are rare neurogenetic disorders caused by abnormalities of chromosome 15, and characterized by intellectual disability (ID), motor impairments, and autistic behaviors. While autism is frequently diagnosed in both, the nature of autistic traits may differ; compared to idiopathic autism, individuals with AS exhibit high social motivation, frequent smiling, and laughing, with limited language and motor skills, and those with Dup15q exhibit greater social interest, again with language and motor delays. Autism diagnoses in AS and Dup15q may thus reflect motor and communication impairments, rather than the core symptoms of idiopathic autism. Assessing autism in genetic syndromes is challenging due to the presence of severe ID, motor impairments, and limited validation of diagnostic tools, which likely *overestimate* autism severity in individuals with significant delays.

Objectives:

This study examines autism-related skills and behaviors in children with Angelman syndrome (AS) and dup15q syndrome, comparing them to individuals with idiopathic autism and intellectual disability (ID). It also explores caregiver perceptions of autism diagnoses and access to interventions, with the goal of enhancing clinical understanding of how genetic differences influence autism characteristics.

Methods:

Participants included 110 children aged 2 to 11 years, with Angelman syndrome (AS; $n = 33$; 13 females), dup15q syndrome ($n = 20$; 6 females), or autism ($n = 57$; 11 females). Caregivers were recruited from syndrome organizations and SPARK. Caregivers completed questionnaires regarding sociodemographics, autism characteristics (SCQ, M-CHAT-R, RBS-R), and access to autism diagnoses and behavioral therapies. Group differences were analyzed using Kruskal-Wallis tests with Bonferroni corrections, and the SPIRIT Macro for differential item functioning on the SCQ and M-CHAT-R between syndromic and idiopathic groups.

Results:

The autism group had the highest SCQ scores (most autistic characteristics) relative to the AS group; scores in AS were higher than for dup15q, but did not reach significance. M-CHAT-R scores were similar across groups, but there were clear group differences in patterns of repetitive behaviors across groups (Table 1), with reductions in ritualistic/sameness, compulsive, and restricted interests and behaviors in AS relative to autism; the dup15q was intermediate. Social interest was a relative strength in the AS but not dup15q group, with “response to name” a salient weakness for AS and dup15q groups. Cluster analyses indicated that autistic traits were predicted by developmental level, communication abilities, motor skills across groups, and found a significant relationship between oromotor skills and autistic traits in AS and autism groups. Many in the syndromic groups had received an autism diagnosis, and parents generally felt that it was appropriate (Table 2).

Conclusions:

Profiles of autistic traits differed across groups, with more repetitive behaviors in the autism and dup15q versus the AS groups. Children with AS showed relative strengths in social interest, but weaknesses in motor and speech abilities, likely linked to developmental delays. Differences in behavior and therapy access emphasize the need for individualized support. These findings contribute to understanding UBE3A gene-related mechanisms in autism traits, and speak to the need for enhanced assessment tools in individuals with autism and ID.



412.201 Cathepsin B As a Pathogenic Factor and Lifelong Biomarker for Autism Spectrum Disorder: Evidence from Large-Scale Plasma Proteomic Analyses

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Background:

The lack of reliable biomarkers considerably impedes the diagnosis and early detection of autism spectrum disorder (ASD).

Objectives:

Identify potential biomarkers for ASD.

Methods:

We conducted a comprehensive study involving two populations: the UK Biobank ($n=36,134$) and an ASD children cohort ($n=296$). We analyzed 2,920 plasma proteins in the UK Biobank to characterize ASD-associated proteomic signatures. Potential ASD-associated proteins were validated in the ASD cohort. We performed multistage analyses, including neuroimaging, biochemical association analysis, and two-sample Mendelian randomization (MR).

Results:

Four proteins (CTSB, LRRC37A2, GYS1, and HLA-A) showed significant associations with ASD genetic risk. Functional analysis revealed enrichment in immune system processes. MR analysis suggested a causal relationship between CTSB (Cathepsin B) and ASD. In an independent Chinese cohort, autistic children exhibited elevated plasma CTSB levels, correlating with symptom severity. Elevated CTSB levels correlated with increased systemic inflammatory index and neurostructural alterations in brain regions associated with ASD. CTSB showed persistently high expression from infancy to adulthood, supporting its potential as a lifelong biomarker.

Conclusions:

Our multi-modal strategy provides convergent evidence implicating elevated CTSB in ASD pathogenesis, supporting its potential as a lifelong biomarker and treatment target for ASD.

412.202 Epigenetic Signature of Autism in Utero: Methylation Profiles of Circulating DNA from Maternal Blood Reflect Child Autism Diagnosis and Synaptic Gene Functions

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Background: As the prevalence of autism spectrum disorders (ASD) has risen substantially over the past few decades, more focus has been given to investigating gene by environmental interactions that associate with the likelihood of ASD diagnosis. Suspected environmental factors are hypothesized to increase ASD likelihood by altering gene regulatory networks in utero. Genome-wide DNA methylation signatures of ASD placenta show promise in reflecting gene networks relevant to the developing brain. Methylation analysis of cell-free DNA, which contains cfDNA from mother and cfDNA derived from fetal trophoblast, has the potential to provide unprecedented longitudinal insight into how environmental factors interplay with the regulation of gene networks involved in neurodevelopment.

Objectives: This project sought to determine if cell-free DNA methylation signatures from maternal blood plasma collected at delivery would distinguish ASD from Non-ASD pregnancies and include neurodevelopmental and synaptic gene networks.

Methods: CfDNA was collected from ~1 ml of delivery blood plasma of 51 participants in the MARBLES prospective elevated-likelihood ASD cohort study, representing 24 ASD and 27 Non-ASD pregnancies from which whole genome bisulfite sequencing (WGBS) from placenta was available. WGBS library preparation was performed on all cfDNA samples with the XGen Methyl-Seq Kit, and libraries were pooled and sequenced across 4 NovaSeq 6000 lanes. The resulting sequencing data was used to generate cytosine reports, which were then used to call differentially methylated regions (DMRs) between the ASD and Non-ASD samples using DMRichR. DMR analysis was performed using both sex-stratified and sex-adjusted strategies to minimize any potential interference of sex on detecting epigenetic signatures of ASD.

Results: We detected a stronger epigenetic signature of ASD in sex-stratified analysis of cfDNA, identified as 1436 ASD DMRs in the male dataset and 3113 ASD DMRs in the female dataset (Figure 1). Sex-stratified DMRs varied considerably in their genomic coordinates, direction of methylation, and genic annotation, but both sets of ASD DMRs showed significant enrichments for genes in pathways related to neurodevelopment such as 'calcium signaling pathway', 'glutamatergic synapse' and 'dopaminergic synapse' as well as enrichments for SFARI ASD genes (p-value = 2.5×10^{-4} for males, and p-value = 5.9×10^{-3} for females). CfDNA ASD DMR genes were also highly enriched for DMR genes identified in matched term placenta samples (p-value = 1.5×10^{-30} for males, and p-value = 5.7×10^{-39} for females), reinforcing the fetal relevance of cfDNA methylation. Despite differences in global directional patterns of DMR methylation, male and female DMR genes significantly overlapped with each other (p-value = 3.0×10^{-49}), indicating that prenatal ASD development may be associated with sex-specific dysregulation of similar gene networks.

Conclusions: An epigenetic signature of ASD is detectable in cfDNA isolated from low volume archived maternal plasma, and is characterized by sex-specific epigenetic dysregulation of gene pathways involved in neuronal synapses and neurodevelopment. Further investigations of the ASD cfDNA methylome hold the potential to illuminate complex ASD etiologies, including which gene networks may be susceptible to environmental factors. In the future, cfDNA methylomes may also be useful for designing early intervention strategies for ASD.



412.203 Genetic Disorders in Autism Spectrum Disorder: Findings from a Population-Based Surveillance System

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Background: Autism Spectrum Disorder (ASD) is an increasingly prevalent developmental disability characterized by deficits in communication, social interaction, repetitive behaviors and sensory processing. These deficits often overlap with other developmental disabilities, which may reflect underlying genetic disorders, in some. Individuals with ASD who also have intellectual disability (ID) associated with genetic disorders may have specific organic and functional profiles that influence treatment and outcomes. It has been estimated that using standard medical genetic evaluation techniques, a genetic cause can be identified in 20–25% of children on the autism spectrum. Knowing how many children with ASD have a specific genetic disorder may improve our knowledge of ASD, leading to more effective interventions and fruitful research. The association between ASD/ID in genetic disorders like Fragile X and Down Syndrome has been known for some time. Published estimates suggest that 10–25% of individuals with ASD may have co-occurring genetic disorders. Population-based estimates of the co-occurrence of known genetic disorders and ASD are needed to confirm this association and to provide baselines for future epidemiologic tracking.

Objectives: This study aimed to determine the occurrence of genetic disorders in a large, diverse, population of ASD children, examine demographic differences and describe the expression of ID in this population.

Methods: Case specific information was from population-based ASD surveillance in New Jersey. This study includes 8-year-olds with ASD identified through the most recent (2016, 2018, and 2020) cycles of comprehensive monitoring. 2016 surveillance encompassed 4 counties (Essex, Union, Hudson, and Ocean). The 2018 and 2020 cycles included Essex and Union counties. ASD cases were identified through the ADDM Network active, retrospective, multiple-source case-finding method, based on analysis of information from health and education sources.

Demographic and case-specific data, including diagnosed genetic conditions and level of intellectual ability, were described and analyzed.

Results: 2,071 children were identified with ASD. Among those, only 45 (2.2%) had a documented co-occurring genetic disorder. Males with a genetic disorder outnumbered females by 3:1. Approximately a third (31%) of ASD cases with genetic disorders had co-occurring intellectual disability (IQ ≤ 70); rates varied from 23% in 2016 to 42% in 2020. Most commonly-identified genetic disorders were: chromosomal abnormalities or duplication errors (n=14), Down Syndrome (n=8) and Fragile X (n=5).

Conclusions: Approximately 2% of 8-year-old children with ASD were determined to have a documented genetic disorder. The frequency of genetic disorders in ASD is lower than expected and may reflect a low rate of genetic testing. These results are preliminary, as they are based on evidence from a single monitoring region and may not be generalizable to other areas of the United States. Additional research, especially comparison to data from other ADDM Network states, is recommended.



412.205 Genomic Landscape of Autism Spectrum Disorder in the Indian Population: Insights from Whole Exome Sequencing and Copy Number Variation Analysis

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Background:

Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder characterized by impairments in social interaction, communication, and repetitive behaviours. In this study, the limited availability of large-scale Whole Exome Sequencing (WES) was addressed and Copy Number Variation (CNV) was analyzed in the children with ASD among Indian population.

Objectives: The study objective was to identify the specific genomic markers associated with ASD among Indian children and adolescents

Methods:

Children and adolescents aged 18 months-18 years fulfilling the diagnostic criteria for ASD, as per DSM-V, were screened. Those who fulfilled the inclusion criteria and provided consent were included, while those with known genetic etiology and neurometabolic disorders were excluded. Around 3-5 ml blood was extracted through venepuncture. Whole Exome Sequencing (WES) was performed and the data was analyzed using a robust bioinformatics pipeline for variant identification, filtering, and annotation. Controls were healthy Indian individuals of varied age and sex who underwent whole genome sequencing.

Results:

Seventy-nine patients were enrolled in the study. A total of 637,681 unique variants were identified in the ASD cohort. After stringent filtering, 340 variants from a panel of 1,210 ASD-associated genes were prioritized. We identified 38 genes carrying pathogenic or likely pathogenic variants, including **HMGCL**, **AGL**, **POGZ**, **ASH1L**, **PTEN**, **OTOG**, **MYBPC3**, **TSC2**, and **NRXN3**. Variants in the **OTOG** gene were observed in four patients, while **ASH1L** variants were found in two patients. Additionally, CNV analysis of 67 samples uncovered 2,170 CNVs, of which five were classified as pathogenic or likely pathogenic. Comparative analysis with 100 Indian control samples identified 8,704 CNVs, of which 19 were significantly associated with ASD.

Conclusions:

This research uncovers a distinct genomic landscape in ASD within the Indian population, laying the groundwork for targeted diagnostic and therapeutic strategies. Ongoing studies aim to further elucidate the role of structural variations, complemented by functional evaluations.

412.206 Immunogenetic Association Supports the Involvement of IL-4 in Autism Spectrum Disorder

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Background: Autism Spectrum Disorder (ASD) is often accompanied by immune dysregulation, encompassing neuroinflammation, systemic immune activation, abnormal adaptive and/or innate cellular response, allergies, autoimmunity. It is unclear whether immune dysregulation contributes to ASD pathogenesis or represents a collateral by-standing phenomenon.

Objectives: To search for genetic association between ASD and 34 functional SNPs (i.e., affecting gene expression or protein function), located in 26 genes involved in 16 different immune pathways, by investigating one experimental and two replica samples.

Methods: We performed a family-based genetic association study involving: (#1) an experimental sample of 502 Italian ASD families (484 simplex and 18 multiplex); (#2) a replica sample including 1,031 multiplex families with 1,553 affected offspring available from the AGRE collection; (#3) another replica sample, including 381 Italian families (359 simplex and 22 multiplex). After quality control, transmission disequilibrium was contrasted in ASD vs unaffected siblings (samples #1 and 2) or in ASD only (sample #3) using FBAT. Plasma concentrations of IL4, IL13, IL5 and GM-CSF were measured using the ELLA immunoassay system (BioTechnique). IL4 and IL4-R mRNAs were quantified in total RNA extracted from PBMCs by qPCR using TaqMan assays and applying the 2- $\Delta\Delta$ CT method after normalization with the housekeeping gene GAPDH.

Results: Sample #1: a significant association was found with IL-4 rs2243250 (Bonferroni adj P=2.0 x 10⁻⁴), CTLA4 rs231775 and LTA rs909253; Sample #2: genotypes at SNPs rs2243270 and rs11571292, in complete LD with rs2243250 and rs231775, confirmed a significant association with IL4 (FBAT p=0.027), but not with CTLA4; Sample #3 conclusively replicated the association with IL4 rs2243250 (FBAT P=0.037). The T allele at rs2243250, consistently overtransmitted from heterozygous parents to ASD offspring in all three samples, is associated with reduced IL-4 expression in live human tissues (enhanced expression only in EBV-transformed cells), but also with differential expression of the KIF3A, SLC22A5, SLC22A4, SEPT8 and HSPA4 genes (eQTL database). Plasma levels of IL-4 were significantly higher in 171 ASD children compared to 55 unaffected sibs (P=0.008) (ASD>sibs also in 58 intrafamilial pairs, p=0.046), and no association with rs2243250 genotypes was found. On the contrary, a significant decrease in IL-4 (p<0.05) and increase in IL-4R (p<0.01) mRNA levels was detected in PMBCs of 116 ASD vs 98 siblings. The phenotypes associated with rs2243250 include asthma, atopic dermatitis, and eczema (PheWAS), which also frequently occur in ASD. In our sample, association with the T-allele reaches a p<0.10 for presence of allergies and a p=0.001 for history of an autoimmune disorder in the patient.

Conclusions: The consistent association between ASD and the T allele at rs2243250 is likely mediated by differential IL-4 gene expression, although mediation by other genes cannot be excluded. The IL-4 pathway plays a pivotal role in Th2 immunity, but also directly influences brain functions, such as learning and memory. This role may be played during pregnancy and/or continue later in life. Further studies will need to address genotype effects and IL-4 functional roles in immune and neuronal cell models.

412.207 Investigation of Genetic Architecture of Autism and ADHD Using New Age at Onset of Walking GWAS Results Indicates Possible Distinct Developmental Pathways

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Background:

Autism and attention-deficit/hyperactivity disorder (ADHD) are neurodevelopmental conditions that often co-occur and show considerable overlap in genetic influences. They both show associations with infant developmental milestones. A genome-wide association study (GWAS) of a key motor milestone, age at onset of walking, has recently been conducted. We investigated the relationship between the genetic architecture of age at onset of walking and neurodevelopmental conditions.

Objectives:

To investigate the underlying common variant genetic architecture of neurodevelopmental conditions.

Methods:

LDSC regression and GenomicSEM analysis were employed using the summary statistics of the latest GWASs of age at onset of walking, autism, attention deficit hyperactivity disorder and other neurodevelopmental conditions. We fitted models to estimate the shared common genetic variance between age at onset of walking and autism and ADHD after taking account of other conditions.

Results:

Age at onset of walking did not significantly associate with autism after taking account of the effects of ADHD and other conditions. Whereas, age at onset of walking did significantly associate with ADHD independently of effects of autism and the other conditions.

Conclusions:

Our results show that age at onset of walking shares genetic architecture with ADHD but not with autism. This result may indicate possible distinct early developmental pathways for autism versus ADHD.

412.208 Many Apparent False Negatives in Detection of Mutations in Gene Associated with Autism Spectrum Disorders

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Background:

Phelan-McDermid Syndrome (PMS) is a neurodevelopmental disorder caused by disruptions to the *SHANK3* gene on chromosome 22q13, encoding a scaffolding protein crucial for synaptic function and neuronal development. PMS presents with developmental delay, intellectual disability (ID), speech impairment or absence, hypotonia, and autism spectrum disorder (ASD) features. Deficiencies in *SHANK3* are caused by a variety of genetic abnormalities, including large deletions involving multiple genes, detectable by chromosomal microarray analysis (CMA), or smaller mutations affecting only *SHANK3*, requiring sequencing-based approaches. The prevalence of PMS is approximately 2.5-10 per million live births, yet mutations in *SHANK3* are among the most common genetic findings in people with ASD, affecting 1% of autism patients. There are no FDA-approved pharmacological therapies for PMS. As a rare disease, maximizing the rate of diagnosis is of the utmost importance for both treatment and recruitment for clinical trials. However, discrepancies exist across U.S. diagnostic laboratories in capabilities, quality, and practices in addressing the genetic complexity of PMS etiology. It is therefore likely that significant numbers of PMS patients go undiagnosed every year, representing a crucial unmet medical need for this rare neurological disorder.

Objectives:

This study aims to address this gap by evaluating U.S. commercial laboratories' *SHANK3* testing quality, identifying exemplary practices and areas for improvement, and disseminating actionable findings to laboratories, patients, caregivers and advocacy groups.

Methods:

To assess the degree to which U.S. laboratories are meeting the diagnostic needs of the PMS community, we established a set of criteria focusing on Next Generation Sequencing (NGS)-based approaches (Table 1). Information on each aspect of *SHANK3* diagnostic capabilities was gathered via web searches, inquiries, and direct communication with laboratories. Laboratories were classified as "optimal", "suboptimal", or "poor", with specific areas for improvement noted and testing volumes documented to assess overall impact.

Results:

Of 12 laboratories evaluated, 3 were classified as optimal, 6 suboptimal, and 3 poor for PMS testing (Table 2). Laboratories considered "poor" do not include *SHANK3* in panel-based testing or whole genome sequencing/whole exome sequencing (WGS/WES), making a positive PMS diagnosis impossible. Problematically, this omission often occurs in platforms advertised as being comprehensive for neurodevelopmental disorders. Suboptimally graded laboratories do include *SHANK3* in testing, but are impacted by incomplete gene coverage, a lack of deletion/duplication analysis, or non-comprehensive variant reporting. While precise testing volumes were not provided by all laboratories, range estimates varied across several orders of magnitude, and no correlation was observed between testing volume and quality classification.

Conclusions:

U.S. laboratories with poor *SHANK3* testing are likely failing to diagnose up to one-quarter of PMS patients, while suboptimal laboratories may be missing 2-3%. Considering testing volumes, it's probable that hundreds of PMS patients have been missed in recent years. Providing information about the most common pitfalls in PMS testing can inform laboratories' diagnostic workflow development, motivate remedial re-testing of previously negative ASD patients, and empower decision making by patients and health care providers.



412.209 Minerva: A Novel Public Web Resource for Learning about Autism Genetics

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Background: US professional medical guidelines recommend clinical genetic testing for all children with autism diagnoses, yet approximately only 3 in 100 autistic children have undergone first-line testing (i.e., chromosomal microarray and fragile X testing). Genetic testing can help explain co-occurring conditions such as seizures and metabolic disorders and suggest specific supports for mitigating these challenges. Although a genetic diagnosis can lead to tailored services for an autistic child, families and clinicians in the child's support network often lack access to reliable, accurate sources of information about clinical genetic testing.

Objectives: To empower learning about genetics tailored to autism, we are building a public, web-based suite of educational resources named MINERVA (Mapping Individualized Estimates to Rare Variants in Autism). In consultation with expert advisory groups and focus groups of parents and pediatricians supporting autistic children, MINERVA will provide several empirically supported resources centered on genetic heterogeneity and clinical genetic testing.

Methods: MINERVA resources include a novel prediction algorithm to estimate an autistic child's personalized probabilities of carrying a neurodevelopmental disability associated variant (NDAV). NDAVs were defined as *de novo* copy number deletions, as well as *de novo* protein truncating variants and disruptive missense variants in genes associated with neurodevelopmental disabilities (including intellectual disability and autism). To develop the prediction algorithm, we harmonized whole exome sequencing and phenotypic data in a combined sample of 3,440 autistic children aged 4-17 years from two independent, diverse North American cohorts. We conducted logistic regression models using multiple, easily accessible phenotypes (e.g., sex, age at walking) to estimate genetic diagnosis probabilities.

Results: We observed extensive heterogeneity in probability estimates throughout our sample, ranging from approximately 2% in males without congenital heart defect who walked at 12 months and had a cognitive score above 110, to over 50% in females with congenital heart defect who started walking at 30 months and had a cognitive score below 70. MINERVA will present genetic diagnosis probabilities for a child along with average probabilities across autistic people (7%) and their non-autistic / undiagnosed siblings (1%).

Conclusions: By providing genetic diagnosis probability estimates along with accessible guides to current scientific and clinical knowledge about autism genetics, MINERVA can help catalyze conversations about autism genetics and informed decision-making around clinical genetic testing for autistic children.

412.210 Molecular and Social-Environmental Factors Uniquely Contribute to Specific Cognitive and Adaptive Outcomes: A Case Study in Fragile X Syndrome

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Background: There is considerable phenotypic heterogeneity even among single gene causes of autism, like fragile X syndrome (FXS).

Approximately 30% of the variance in IQ among individuals with FXS is accounted for by familial genetic and molecular factors, including absence or reduction in fragile X messenger ribonucleoprotein (FMRP) expression. The remaining 70% of this variance is partially accounted for by social-environmental factors (e.g., education, access to therapies, home environment, nutrition) that have not yet been systematically examined in FXS.

Objectives: Identify the unique contributions of social-environmental and biological factors to individual differences in cognitive and adaptive behaviors in individuals with FXS.

Methods: 207 individuals with FXS (69% male) aged 4-72 years (mostly adults) completed the Stanford-Binet, Fifth Edition (SB-5) to estimate IQ. Participants' caregivers completed the Vineland-3 Comprehensive Interview to measure adaptive skills. FMRP was quantified using our validated Luminex-based assay. Standardized rankings of "neighborhood opportunity" were extracted based on participant home addresses at the time of testing using the Child Opportunity Index (COI), which ranks the economic, educational, and health/environmental resources of individual neighborhoods relative to national averages (higher scores reflect greater opportunities). We examined the variance in IQ and adaptive behaviors accounted for by neighborhood factors versus the variance accounted for by FMRP expression.

Results: Associations between positive neighborhood opportunities, higher IQ, and greater adaptive behaviors were significantly stronger in males with FXS than females. In males with FXS, even after controlling for age, FMRP accounted for about 3% of variance in IQ, with an additional 5% accounted for by access to healthcare resources (e.g., insurance availability; nearby healthcare nonprofit organizations). On the other hand, greater economic equity, employment opportunities, social-economic resources (e.g., multi-caregiver households; cross-income friendships), and educational resources (e.g., teacher experience) accounted for significant variance in adaptive skills beyond FMRP. Of these, the strongest predictor of overall adaptive behaviors were social-economic resources, which accounted for about 10% of the variance. In females with FXS, greater healthcare resources also were associated with higher IQ, although this association was no longer significant after accounting for FMRP expression.

Conclusions: Our findings show that distinct social-environmental factors contribute to individual differences in IQ and adaptive skills in FXS even after accounting for FMRP expression. Thus, similar social-environmental factors may contribute to individual differences in IQ and adaptive skills in other genetic and idiopathic ASDs. We also emphasize that although neighborhood-level opportunities are important, they are not universally related to cognitive and adaptive skills, and vary based on sex. Our finding that adaptive behaviors are most strongly related to social-economic supports warrants further investigation using narrowband measures and qualitative interviews with families to identify pathways through which these social-economic factors foster adaptive behaviors. Long-term, we hope this and follow-up studies will determine the extent to which findings are specific to FXS and which generalize across ASDs in order to enable the development of targeted interventions that combine both biological as well as family- and systems-level interventions to positive influence development.

412.211 Newborn Blood DNA Methylation Correlates Likelihood of Autism Spectrum Disorders with Grandparental Age, Alcohol Intake, and Cigarette Smoking

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Background: ASD is a group of neurodevelopmental conditions characterized by deficits in social reciprocity and communication, restricted interests, and repetitive behaviors. The etiology of most ASD cases is thought to be a combination of genetics, environmental factors, and gene-environment interactions that are poorly understood. Grandparental non-genetic factors, such as cigarette smoking during pregnancy and advanced age at conception, have been associated with increased risk of ASD in the grandchild, but potential molecular mechanisms and biomarkers have not been studied in a human cohort.

Objectives: In this study, we examine ASD versus typically developing (TD) newborn blood DNA methylation patterns to make biological connections between grandparental exposures and ASD diagnosis in the grandchild.

Methods: To conduct this study, we used two unique three-generation cohorts. The discovery dataset is from the Child Health and Development Studies (CHDS), which enrolled pregnant women in Oakland, CA from 1959-1967 and conducted follow-up studies with their children and grandchildren. The replication dataset is from the Child Autism Risks from Genetics and the Environment (CHARGE), which enrolled case-controls in the Sacramento region, CA from 2006 and conducted follow-up studies and asked grandparents for their participation. We obtained newborn dried blood spots (NBDS) from 196 CHDS grandchildren (84 ASD, 112 TD) and 174 CHARGE grandchildren (113 ASD and 66 TD) and assayed DNA methylation using whole genome bisulfite sequencing (WGBS). To analyze the newborn blood DNA methylation, we identified co-methylation modules using Comethyl, a weighted gene correlation network analysis (WGCNA) approach that has been optimized for WGBS data. Co-methylation modules consist of genomic regions with correlated methylation and can be reduced to single eigennode values that can be correlated with sample traits, including grandchild neurodevelopment and grandparental exposures (Figure 1).

Results: In the CHDS cohort we identified two co-methylation modules (orange and purple) that were significantly (Bicor=0.16, $p=0.026$) positively associated with ASD diagnosis, with ASD NBDS having higher methylation values than TD NBDS in both modules. We found that both ASD co-methylation modules were also significantly correlated with several grandparental traits, with different findings in maternal versus paternal lineages. Eigennode values from the orange module were negatively associated with maternal grandparent alcohol intake (Bicor=-0.27, $p=0.050$) and positively associated with paternal grandparent age at conception (grandfather Bicor=0.27, $p=0.00011$; grandmother Bicor=0.25, $p=0.0091$), while eigennode values from the purple module were positively associated with paternal grandfather cigarette smoking (Bicor = 0.21, $p = 0.0025$). The orange module mapped to genes *TLX3* and *RANBP17*, which have both been previously implicated in ASD, and *RANBP17* has been implicated in aging. The purple module mapped to genes *PTPRJ* and *TRIM49B* which have been previously linked to ASD. The analysis for the CHARGE cohort is ongoing as a replication for the CHDS findings.

Conclusions: The results from this study so far provide biological insight into grandparental factors associated with the likelihood of ASD and show that DNA methylation may be a mechanism by which factors such as age, alcohol intake, and cigarette smoking transfer the impact of these factors across generations.

**412.212** Non-Synonymous Variants' Enrichment Identifies Modules of Spatio-Temporal Co-Expressed Genes Functionally Associated with Autism Subtypes

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Background: Given the heterogeneity of the condition, the identification of the functional implications of genes' variants related to autism commonly requires large-scale studies involving thousands of participants. An alternative perspective is to shift the focus from single genes to networks of genes that converge in functionally relevant biological processes, e.g. by using gene-set analysis. This approach permits to examine the combined effect of multiple DNA variants that cumulatively impact biological pathways potentially relevant to autism, reducing the impact of multiple testing and increasing effect size.

Objectives: In the present study, we aimed to explore whether an unbiased multi-step analysis could identify and functionally characterize gene-sets with relevance to autism subtyping in terms of different variants' load among two subgroups of autistic children.

Methods: After subdividing our sample of 71 autistic children (3-12 years) in two subgroups with higher (>80 ; $n=43$) and lower (≤ 80 ; $n=28$) intelligence quotient (IQ), a gene-set variants enrichment analysis was applied to identify gene-sets with significantly different incidence of non-synonymous variants between the two subgroups. Using a data-driven, unsupervised approach, gene-sets were then clustered into modules with more homogeneous enrichment scores. Next, to functionally characterize genes in the modules, we investigated their expression profiles according to the BrainSpan Atlas of the Developing Human Brain. Last, we considered an enlarged pool of genes by including those most correlated ($r>0.7$) with the genes in the modules. In this enlarged pool, we assessed gene spatio-temporal co-expression in BrainSpan Atlas, and protein-protein interactions according to the BioGRID database. Among them, we further explored the incidence of high-confidence autism-related genes as reported by the Simons Foundation Autism Research Initiative (SFARI) database.

Results: Our analysis identified 38 significant gene-sets (false discovery rate, $q<0.05$) with different variants' load in the two subgroups of autistic children. These gene-sets, which included 207 genes in total, were clustered in four modules representing specific biological processes, such as ion cell communication, neurocognition, gastrointestinal function, and immune system. Those gene modules were highly expressed in specific brain structures across different developmental stages, except for the immune module. When considering the enlarged pool of correlated genes, they were significantly spatio-temporally co-expressed and organized in three clusters. They also highly interacted at the level of protein-protein interactions (Fig.1). Moreover, among the entire pool of correlated genes, high-confidence SFARI genes were overrepresented ($OR=2.59$; $p=0.001$).

Conclusions: Our unbiased multi-step analysis could identify gene modules functionally meaningful to autism even in a relatively small set of participants. We further documented the brain expression of those genes, their spatio-temporal co-expression and functional interplay. Lastly, the relevance of the identified gene modules in autism manifestation was supported by their interactions with many SFARI genes. Although these observations should be considered with caution, future research could leverage the present approach to identify genetic pathways relevant to autism subtyping, towards the identification of distinct biotypes of patients.



412.213 Psychopharmacology in Children with Genetic Disorders of Epigenetic and Chromatin Regulation

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Background: Over 100 neurodevelopmental disorders (NDDs - i.e. autism or intellectual disability) caused by variants in epigenetic or chromatin regulatory genes have been identified. Estimates of psychotropic medication use in children with NDDs range from 30-60%, and psychotropic polypharmacy is common. Yet, there are limited published clinical data, and no biomarkers, to guide psychotropic medication choice in NDDs. Whether individuals with genetic disorders of epigenetic/ chromatin regulation have differential responses to psychotropic medications, and whether methylation changes may serve as a biomarker of psychotropic treatment response in this population have not been examined.

Objectives: The objective of this study was to examine and compare behavioural profiles and longitudinal treatment patterns in children with epigenetic/chromatin disorders, other genetic NDDs, or no known genetic disorder.

Methods: Using the electronic medical records from a pediatric psychopharmacology program for children with NDDs, we compared clinical characteristics, longitudinal psychotropic medication profiles and reports of side effects across the three genetic groups. As an exploratory analysis, serial methylation analyses were conducted during pharmacotherapy trials in a child with ARID1B-related disorder (ARID1B-RD).

Results: A total of 331 children attended the program between 2019 and 2022. Nine children had variants in single genes known to have a primary epigenetic regulatory function (3%), and twenty-three children had other rare genetic NDD variants (7%). Developmental and psychiatric profiles were similar between groups, except for intellectual disability [epigenetic variant: 6/9 (66%), other variant: 12/23 (52%), no variant: 92/299 (31%), $p<0.01$]. Treatment patterns were similar, however side effect profiles differed: those with genetic variants were more likely to experience drowsiness (33 and 35% vs. 16%, $p<0.05$); those with epigenetic variants were more likely to experience weight gain (44%, vs. 9% and 21%, $p<0.05$). A methylation signature consistent with ARID1B-RD was detected; no methylation changes were associated with risperidone or methylphenidate.

Conclusions: Genetic classification of neurodevelopmental disorders may help anticipate treatment tolerability; the integration of diagnostic and therapeutic biomarkers merits further study.

412.214 Relative Diversity Associated with Neurexin Trajectories (RaDiaNT): A Protocol for a Family-Based Study of a Rare Genetic Condition

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Background: *NRXN1* deletion (*NRXN1del*) is a rare neurogenetic condition associated with autism, intellectual disability and speech and language delay. The *NRXN1* gene encodes for a pre-synaptic cell adhesion molecule important for brain development and neurotransmission, providing a mechanistic pathway to investigate clinical outcomes. The Relative Diversity associated with Neurexin Trajectories (RaDiaNT) study is a family-based cross-sectional design that aims to examine the genetic heterogeneity contributing to variability in cognitive, language, social and mental health outcomes in *NRXN1del* carriers and family members. It is hypothesised that additional genetic factors may modify phenotypic outcomes. **Objectives:** To (1) refine a protocol to examine the prevalence of a range of neurodevelopmental and neuropsychiatric outcomes and traits in a large cohort of *NRXN1del* carriers and their family members; and (2) investigate the role of polygenic and rare variant burden in *NRXN1del* clinical outcomes.

Methods: Research sites include Trinity College Dublin, Ireland, The Hospital for Sick Children, Canada, and Murdoch's Children's Research Institute, Australia. The family-based design focuses on *NRXN1del* carriers, their parents, and nearest age sibling. Inclusion criteria are at least one family member with a clinical genetic diagnosis of *NRXN1del*. We have established a study protocol that includes online questionnaires, interviews and direct assessments to assess medical history, psychopathology, speech and language, cognitive ability, adaptive functioning, and quality of life across family members. We developed a measure of protocol feasibility to inform and refine family-based study designs including neurodiverse individuals. We record completion rates of cognitive and behavioural tasks within the protocol, and reasons measures are "partially complete" (inability to pay attention, tired/bored, got upset, behavioural issues, ran out of time), "complete but unsure about validity" (cognitive understanding, behavioural issues) and "not attempted" (refuse to complete, behavioural issues, tired/upset on day of visit). We also collect biosamples from all family members for whole genome and long read sequencing for copy number variant (CNV) breakpoint mapping and the identification of common and rare variation elsewhere in the genome. We will examine the influence of *NRXN1del* location and size, and common and rare genetic variation on clinical and behavioural outcomes.

Results: To date, 29 individuals from 8 families have been recruited at the TCD site; 13 *NRXN1del* carriers ($21.25 \pm SD = 13.97$; 7 male and 6 female) and 16 non carriers ($31.17 \pm SD = 26.66$; gender = 11 male, 5 female). Among children and sibling carriers of *NRXN1del*, 78% (n=7) had a parent-reported clinical diagnosis of autism, and 66% (n= 6) had an intellectual disability. Preliminary feasibility data indicate findings important for understanding accessibility of a battery of tablet-based cognitive tasks, with the battery partially completed by three participants due to frustration (n=1) or noise distraction (n=2), and not attempted by six participants due to cognitive and language level (n=5) and hyperactivity (n=1). **Conclusions:** Gene first approaches offer several advantages for studying rare neurogenetic conditions including important clinical and biological insights. The family-based design can enhance our understanding of genetic and environmental factors contributing to clinical outcomes.

412.215 Sexual Dimorphism in Autism: Exploring Gene Expression Differences As a Possible Etiological Factor.

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Background: Autism Spectrum Disorder (ASD) is a genetically heterogeneous condition, presenting with a notable sex bias, where males are diagnosed approximately four times more frequently than females. While various hypotheses attempt to explain this skewed sex ratio, the underlying physiological mechanisms remain elusive. Previous transcriptomic studies in neuronal cells of individuals with ASD have consistently identified dysregulation in modules of co-expressed genes. This observation raises the possibility that differences in the basal regulation of gene expression between males and females during neurodevelopment could contribute to the observed sex bias in ASD prevalence.

Objectives: We aimed to investigate whether gene co-expression modules, identified in fetal brains and enriched by ASD-associated genes, differ between sexes in terms of structural relationships or expression levels.

Methods: We utilized publicly available transcriptomic data from cortical regions of fetal brains (16-21 weeks of gestation), a critical period and region already implicated in ASD. Using Weighted Gene Co-Expression Network Analysis (WGCNA), we constructed gene co-expression networks for male and female brains independently and a consensus network in order to map the common and differential co-expression relationships, focusing particularly on those modules enriched by ASD-associated genes.

Results: We found 5 modules in the consensus network that are enriched by ASD-associated genes. A module related to cell migration and cell adhesion presented a higher level of expression in male brains. Additionally, some of these modules presented as a unique module in males, and as a distinct modules in females, and vice-versa, revealing differences in the structural organization of regulatory networks between the genders. Particularly, we found that, in male brains, a module related to expression regulation has an inverse correlation with the expression of a module enriched by genes related to synapse, while in female brains, the expression levels of these two modules are positively correlated.

Conclusions: The results obtained so far suggest that differences between sexes, both in terms of structure and gene expression profile in modules important for autism spectrum disorder, may be factors that contribute, at least in part, to the sexual dimorphism present in autism spectrum disorder, which is reflected in the more prevalent diagnostic ratio in men.

412.216 Somatic Variants in Autism Spectrum Disorder Revealed By Ultra-Deep Whole Genome Sequencing

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Background: Non-inherited somatic variants that arise after fertilization have been identified by exome sequencing to contribute to 3-5% of simplex autism spectrum disorder (ASD) cases. A preliminary study using whole genome sequencing (WGS) further suggested that ASD brains may be enriched in non-coding somatic variants located in critical neural enhancers (Rodin et al., 2021). However, this study used bulk brain tissue instead of neurons and included only a small number of ASD cases.

Objectives: Here, we aimed to identify somatic variants in neurons from postmortem human brain tissue in ASD cases compared to neurotypical controls by using ultra-deep whole genome sequencing.

Methods: Frozen post-mortem frontal cortex from ASD cases (n=58) and control cases (n=48) were dissected and homogenized to isolate nuclei. To increase the sensitivity to detect clonal somatic variants that arose during fetal development, the time period of ASD pathogenesis, we used DNA from purified neurons rather than bulk brain tissue. Neuronal nuclei were separated from non-neuronal nuclei using fluorescence-activated nuclei sorting. DNA was extracted by phenol chloroform purification. WGS libraries were prepared and sequenced using 150bp paired-end reads to >210X coverage. Datasets were aligned to hg19 reference and preprocessed with GATK. Candidate somatic variants were initially identified using TNHaplotyper2 and then the callset was refined using MosaicForecast, a machine-learning based caller that is specialized for detecting variants with low variant allele fractions.

Results: Our preliminary analysis shows a greater number of potential somatic variants using WGS obtained from flow-sorted neuronal nuclei compared to previous datasets using bulk brain. Overall, WGS in neuronal nuclei identifies 62.8% more somatic single nucleotide variants than WGS using bulk brain tissue. Furthermore, WGS from flow-sorted neuronal nuclei identifies many lower allele fraction variants compared to bulk tissue.

Although the average numbers of somatic single nucleotide variants did not differ between ASD brains compared to control brains, ASD brains show significantly more variation in somatic single nucleotide variant counts than control brains. For example, one of the ASD brains exhibited ~2.5-fold more somatic variants than the average of either ASD or control donors. This brain shows a cluster of 72 predicted somatic variants spanning a 74-Mb stretch of chromosome 16. These variants show allele frequencies that likely correspond to mutations arising in the second and third cell divisions in early embryonic development.

Conclusions: We find evidence for differences in the distribution of somatic variants in ASD brains compared to control brains. Future analyses will focus on identifying the genomic context of somatic variants, comparing mutational signatures between ASD brain neurons and control brain neurons, and exploring the functional impact of somatic variation. This work has implications for understanding the mechanistic and genetic basis of ASD.

412.217 “We Need Community-Centred, Strongly Ethical Genetic Research”: A Qualitative Investigation of Community Attitudes Towards Autism Genetics

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Background: Studies of the genetic aetiology of autism have attracted substantial research funding internationally. Translation of study findings into benefits for the Autistic community has lagged. Critically, the needs and priorities of the Autistic community with respect to autism genetics research are poorly understood.

Objectives: To explore the attitudes, experiences, and concerns of Autistic people and their parents/ carers towards autism genetics research.

Methods: We collected first-hand accounts of Australian Autistic individuals and their allies in a series of semi-structured interviews, focus groups, and qualitative surveys. The study design and interview schedule were co-produced with guidance from three separate advisory groups, including Autistic adults, parents of Autistic people, and autism research and healthcare professionals. Thirty-three community members took part in the study. Many held multiple simultaneous roles within the Autistic and autism communities. Twenty-eight participants (84.8%) identified as Autistic, 13 (39.4%) as parents of Autistic and/or neurodivergent children, and 12 (36.4%) as autism-related professionals (e.g., researchers, advocates, healthcare workers). Participants were an average of 38.9 years old at the time of their interview (range 21-76, SD = 13.3). The data were analysed within a critical realist framework using reflexive thematic analysis.

Results: Analysis of our interviewees' discussions about autism genetics research identified three main themes, and eleven sub-themes. The first theme related to autism genetics research having eugenic potential, and community concern for how it perpetuates negative attitudes about Autistic traits and people. The second theme focused on disillusionment and distrust towards the field of autism genetics research. Interviewees expressed a lack of trust of people in power stemming from their failure to integrate urgent community priorities within the research aims. The final theme focused on the positive potential of autism genetics research, with caveats. Community members believed that genetics knowledge could hold health benefits for the Autistic community. However, they felt these benefits could only be achieved through trust-building and improved engagement of Autistic voices in the research.

Conclusions: Our work outlines a path forward in co-design methodologies for undertaking community priority setting with respect to autism research. Our findings highlight the current relationship and perceptions that exist between community members and autism genetics researchers that need to be acknowledged and addressed in order for meaningful advances in this field. This research holds important implications for the design and conduct of future autism genetics research both locally and internationally.

Poster Session

413 - International and Cross-Cultural Perspectives I

May 1st, 2025, 5:30 PM - 6:30 PM - Hall 4A

413.218 How Do Transfronterizo Families Scaffold Their Autistic Children's Bilingual Language Interactions in Everyday Settings? **S. R. Cohen¹**, A. Wishard Guerra², M. J. Aragon³, A. Estrada⁴ and E. Lee⁵, (1)University of California, San Diego, San Diego, CA, (2)UC San Diego, La Jolla, CA, (3)Education Studies, University of California, San Diego, La Jolla, CA, (4)University of California, San Diego, La Jolla, CA, (5)UCLA, Los Angeles, CA

Background: Parents' language practices, quantity and quality of linguistic input, predict children's language outcomes (Anderson et al., 2021). For multilingual families, common misperceptions about language learning (e.g., "English only is best,") persist (Peña, 2016). These beliefs shape pedagogy, interventions, and recommendations by therapists, discouraging families from using their home language (Peña, 2016). Recent studies show cognitive benefits of bilingualism for autistic children (Peristeri et al., 2024). These benefits include improved cognitive flexibility and executive functioning outcomes, the ability to understand "false beliefs," and increased focus, as compared to their monolingual autistic peers (Ge, et al., 2023).

Objectives: This study aims to: (1) characterize families' language practices during daily routines; (2) explore how these language strategies vary by activity context; and (3) examine how parents' language scaffolding strategies relate to children's language production.

Methods: 179 video recordings were collected from five bilingual mother-child dyads living in transborder communities. Transcripts were categorized by activity setting: Daily Living, Reading/Homework, Family Mealtime, Play, or Transportation. Transcripts were separated by utterance then coded with one of four codes: scaffolding, contextualized reference, decontextualized reference (DR), and questions. Computerized Language Analysis (CLAN) software was applied to examine participants' language production. Language quantity was measured by number of words, number of utterances, and words per minute. Language quality was determined by mean length of utterance (MLU), type-token ratio (TTR), word variety, and the proportion of DR.

Results: Mothers used Spanish more than children, and their Spanish included significantly longer, and more varied utterances than their English utterances. Children had significantly more variability in their language use than their mothers. Children had significantly more DR ($M = 0.24$) than their mothers ($M = 0.20$), $t(107) = 1.96$, $p < 0.001$.

To examine the impact of families' activity settings on mothers' language practices, we conducted linear mixed effects models with four mother language factors across activity settings: (1) language quantity; (2) language quality; (3) acknowledge and extend; (4) questions. Interactions during transportation activities included significantly higher maternal language quality compared to reading/HW ($\beta = 0.99$; St Error = 0.24; CI: 0.52-1.47; $p < 0.000$). For aim three, mothers' use of DR, and the number of words that mothers used, predicted children's DR (quality: $\beta = 0.21$; St Error = 0.02; CI: 0.17-0.25; $p < 0.001$; quantity: $\beta = 0.04$; St Error = 0.02; CI: 0.004-0.08; $p < 0.05$). Mothers who acknowledged and extended their child's language had children who used more DR ($\beta = 0.04$; St Error = 0.02; CI: 0.00-0.07; $p < 0.05$).

Conclusions: Recent calls for "a contextually sensitive analysis" challenges researchers to consider how sociocultural context complicates autism research (Bottema-Beutel, 2024). Our study prioritized multilingual families' contexts and their linguistic resources to show that (1) bilingualism promotes daily complex language use; (2) distinct home activity settings moderate language interactions among autistic bilingual children and their mothers; and (3) variability in maternal language scaffolding optimize children's use of DR, or the language of abstract reasoning.



413.219 Autism Research Capacity Building in Northern Mexico: Continued Evaluation of an Ongoing Process

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Background: Research capacity (RC) is often measured with long-term outcomes of high-quality research, such as peer-reviewed publications or successful grant applications. This framework may not address relevant issues contributing to progress, particularly amongst the initial stages of development or when RC building occurs in Low-Middle Income Countries (LMICs). Perez-Liz et al. (2024) reported the sequential evaluation (2018, 2020, and 2022) of the RC building process in Northern Mexico. The report used a six-principle framework (Cooke et al., 2004) across four levels of development. The current study updates the former report as of October 2024.

Objectives: To evaluate the ongoing process of autism RC building in Northern Mexico, utilizing Cooke's framework, updated to October 2024 and analyze the progression of each level over the four time points collected (2018, 2020, 2022, and 2024).

Methods:

Six principles of RC building were evaluated along four levels of development activity (individuals, teams, caregiving organizations, and networks and support units): 1. Skills and confidence building; 2. Support of research 'close to practice'; 3. Linkages, partnerships, and collaborations; 4. Appropriate dissemination; 5. Continuity and sustainability; 6. Appropriate infrastructures. A matrix of criteria for each principle x level was defined by two founding members of the initiative and rated according to the development stage as of November 2018, December 2020, March 2022, and October 2024 as *Not started*, *In Progress*, or *Achieved* by two independent coders. Disagreements in coding were discussed between coders and resolved by one of the founding members. A comparison of the four time points was made and a summary including the accomplishments expected in the initial stages of RC building, and the identification of priorities for the next years was produced.

Results: Two new criteria were added to the existing list of 64 criteria originally identified guided by the model; of these, 31 (48.4%) were rated as *Achieved* or *In Progress* in 2018, versus 51 in 2020 (79.7%), 59 in 2022 (92.2%) and 64 in 2024 (97%). Consequently, the percentage of criteria rated as *Not Started* decreased from 51.5% in 2018 to 17.8% in 2020, to 7.2% in 2022, to 3% in 2024. By 2024, only two principles had items rated as *Not Started*: Principle 5 (Sustainability and Continuity), and Principle 6 (Infrastructure). Principle 4 (Appropriate dissemination and impact) continued to have the least number of items rated as *Achieved* in 2024 as compared to previous timepoints.

Conclusions: Cooke's framework has allowed a continued evaluation of the process of autism RC building in Northern Mexico at four time points: before starting their first research study in 2018, then in 2020, 2022, and 2024. Distinctively, principle 3 (Linkages, collaborations, and partnerships) was rated as the relative strength of this initiative from the launch of the first project and achieved most progress over the six-year comparison. Principle 4 (Appropriate dissemination and impact) continues to be an area of challenge. This ongoing evaluation will contribute to informing research efforts.

413.220 Autism Spectrum Disorder (ASD): The Situation Today in Libya: A Perspective

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Background:

Objectives:

Methods:

Abstract

Background Libya is a country in North Africa. It is bordered by the Mediterranean Sea to the north, It covers an area of almost 1.8 million square kilometers (700,000 sq mi). Libya is the 17th largest country in the world. The capital of Libya is Tripoli. Libya is a developing country ranking 92nd by The Human Development Index (HDI), the highest score in mainland Africa. While research on autism in Africa is increasing, current knowledge and information are still limited, with only about 1% of autism research originating from sub-Saharan Africa. This lack of representation is significant due to the inequalities in identifying and supporting individuals with autism and their families. There is a shortage of published research on autism in Africa, making the evidence basis for autism intervention and treatment insufficient.

Objectives: In Libya, the prevalence of ASD has risen significantly since 2005. A more recent hospital-based study conducted in 2023 at the neurodevelopment clinics of Tripoli University hospital, reported a prevalence of about 8:1000. These hospital-based studies highlight the substantial burden of ASD in Libya.

The purpose of this paper is to provide a thorough overview of the state of knowledge on ASD in Libya, along with recommendations for improving identification, assessment, management, and policy in these particular circumstances. In order to better understand the problem, efforts should be undertaken to raise awareness of ASD among families and to produce resources and educational materials that are both linguistically and culturally acceptable.

Methods: This is large hospital-based study. The study's two-stage sampling involved first studying the prevalence of ASD; and then All the families of children with ASD attended between Jan.2022 and Jun.2024 (445 children) weighted to be nationally representative of children with ASD were asked two specific questions related to ASD care and services. All children enrolled in this category did meet full DSM-V criteria for an ASD. All the studies were conducted at the pediatric neuro-development clinics of the two main teaching hospitals in Tripoli, Libya.

Results: This study revealed prevalence rates among children of 8:1000.74% of the families involved in the study were not happy about the service their children were receiving. They felt very socially isolated and started to adopt guilt and embarrassment. Of note, ASD rate in girls have steadily risen in recent years

Conclusions: These hospital-based studies highlight the substantial burden of ASD in Libya. There is currently a shortage of data on ASD in Libya, with the most of the information originating from HIC e.g. USA and Europe. Prioritizing funding for ASD will help to increase access to care, through the use of qualified medical personnel, specialist centers and schools, and the availability of relevant equipment and resources. In order to develop inclusive communities, children with ASD and their families should be given the full support they need.

413.221 Barriers to Autism Education: Professional Insights from across Latin America

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Background:

Autism spectrum disorder is a lifelong neurodevelopmental condition characterized by challenges in social communication and restricted behaviors. Globally, there is a shortage of professionals trained in autism diagnosis and intervention, leading to long wait times for services (Smith et al, 2020). In Latin America, this shortage is compounded by additional barriers such as limited resources, high training costs, and insufficient public policies supporting autism care. Prior research highlights that training deficits in neurodevelopmental conditions are common in medical and educational settings, particularly in low- and middle-income regions (Alvarez et al., 2024; Sohl et al., 2024). The need for specialized training is urgent, as studies show a clear link between professional development and improved care outcomes for individuals with autism (Mazurek et al, 2017; Buranova et al., 2022; Sohl et al., 2024).

Objectives:

This study aims to assess the main challenges and barriers faced by health professionals in Latin American countries in accessing specialized autism training and certification programs.

Methods:

ECHO Autism is an international capacity-building initiative designed to improve access to autism care by connecting specialists with local professionals through virtual mentorship and training. 108 responses were collected from the Minimum Data Set (MDS) is a standardized survey of various aspects of ECHO program implementation (Sohl et al., 2024). A more targeted survey of barriers to professional training (Alvarez et al., 2024) was conducted to gather additional information. Over 612 responses were collected from healthcare and educational professionals across 18 Latin American countries, including school teachers, therapeutic companions, and school psychologists, with over 20 other professions represented. Of the respondents, 62.2% reported having less than six months of autism training, 13.7% had 6 months to 1 year, and 24.1% had over 1 year of autism training.

Results:

Data from the MDS revealed that 96% of respondents felt their undergraduate training did not adequately cover autism, and 92% perceived a disparity between the financial investment required for specialized training and the compensation they received for providing autism-related services. Key barriers identified in the MDS also included the high costs of training opportunities and the lack of institutional and policy support for autism care. The broader barriers survey echoed similar concerns, with the top three challenges identified as the high costs of specialized training, insufficient autism-related content in undergraduate and graduate programs, and the overall lack of available training proposals in the region.

Conclusions:

This study provides valuable insights into the barriers that limit access to autism training for professionals across Latin America. The findings highlight the need for public policy reforms, enhanced institutional support, and more affordable and accessible training opportunities to expand the pool of qualified professionals. Addressing these barriers is critical for improving autism care, reducing wait times for diagnostic and intervention services, and ensuring that professionals are adequately prepared to meet the growing demand for autism-related services in Latin America. Implementing these changes will likely result in better care outcomes for individuals with autism, benefiting both families and healthcare systems across the region.

413.222 Best and Worst of Both Worlds: Experiences of Transfronterix Mothers Navigating Binational Autism Services

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Background: Binational collaboration is needed to address the unique needs of transfronterix families of autistic children. Transfronterix are dual US-Mexican citizens and/or residents who live in Mexico and travel to the U.S. for employment, health care, and community support. Reports from the Washington Office on Latin America show that on average 200,000 people cross the U.S.- Mexico border daily (Border Report, 2024, June 25). *Transfronterix* are a mix of privileged border commuters entering the U.S. with a Secure Electronic Rapid Inspection Card (SENTRI), and disadvantaged border residents who, after their return from the U.S., are barred from entering legally due to their immigration status, and may experience constant threats for deportation and criminalization. Transfronterix mothers of autistic children pursue various types of autism services in both Mexico and the U.S., and experience service unique disparities due to systemic barriers and lack of culturally sustaining care in both countries.

Objectives: The purpose of this study was to explore and document the 1) autism service experiences along the U.S.-Mexico border, 2) migratory motivations and reasoning of Mexican mothers of autistic children pursuing autism services in the U.S. and 3) socio-cultural factors that impact autism service access.

Methods: Following a Community-Based Participatory Research (CBPR) approach, researchers collaborated with community partners in the development of qualitative research materials while also supporting the purposeful recruitment of caregivers who: 1) had an autistic child or a child at risk for autism between 2-7 years of age, 2) crossed the US/Mexico border on a weekly basis to access autism-related services; and or 3) moved from Mexico to the US to receive autism services and continued to access other services in Mexico thus crossing the border on a weekly basis; and or 4) lived in the US and have looked for autism services in Mexico and cross the border on a weekly basis for family and other social supports.

Results: Findings highlight how the Mexican autism system is divided into public and private sectors resulting in families having to navigate both saturated systems with long waitlists, expensive fees, and slow child progress. Mothers capitalize on their transfronterix resources to pursue binational autism services through their willingness to engage in various sacrifices. Compounded by social pressure, stigma, and economic resources, mothers justify their decisions to pursue binational services as they recognize that both the U.S. and Mexico service systems are lacking and believe that this path will provide the best possible outcomes for their children.

Conclusions: The geographical proximity and scarcity of autism services at the US-Mexico border calls for extensive research on binational autism services. Increased collaboration is needed along the U.S./Mexico border to educate and support families navigating bicultural and immigration stressors, loss of social capital, and barriers to binational autism services in this region.

413.223 Concordance Values between Autism Symptoms Parental Interviews and Checklist Among Latino Children in the United States: Preliminary Results

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Background: Early detection of autism spectrum disorder (ASD) is fundamental for improved clinical outcomes. However, screening tools developed in English may not be as effective for Spanish-speaking populations. The Toddler Autism Symptom Inventory (TASI) and the Modified Checklist for Autism in Toddlers, Revised (M-CHAT-R) are validated instruments to screen autism in young children. However, there are no studies on their concurrent validity with other diagnostic measures in Latino children in the United States. Determining the psychometric properties of different screening and diagnostic instruments in culturally diverse populations of autistic children will decrease health disparities and barriers to accessing services in these often marginalized ethnic minorities.

Objectives: To examine the concordance values between the scores of the Spanish versions of the TASI with the ADOS-2 and between the M-CHAT-R with the ADOS-2.

Methods: This exploratory study is part of a broader project examining the psychometric performance of autism screeners in Latino children. Participants were recruited from local autism parent support group organizations in the Texas-Mexican border region, and the final sample consisted of 34 Spanish-speaking child-parent dyads ($n=34$), 13 females and 21 males with an average child's age of 60.56 months ($SD=12.49$). Participants completed the Spanish version of the TASI, the M-CHAT-R, and the ADOS-2 with bilingual examiners. Descriptive and bivariate correlation analyses examined the relationship between the Spanish TASI, the M-CHAT-R, and the ADOS-2 scores.

Results: For our sample, results indicated that a moderate positive correlation between the calibrated severity scores of the ADOS-2 and total scores of the Spanish TASI, ($r(34) = .481, p = .01$), and a strong positive association between the calibrated severity scores of the ADOS-2 and total scores of the Spanish M-CHAT-R, ($r(34) = .556, p = .01$). In terms of the ADOS-2 Social Affect domain, positive correlations were identified with the TASI-Social Communication domain ($r(34) = .553, p = .003$), and the M-CHAT-R mean score, ($r(34) = .370, p = .041$). However, there was no significant relationship between the ADOS-2 Restricted and Repetitive Behavior (RBB) domain and the RRB sections from the TASI or the M-CHAT-R.

Conclusions: Preliminary findings from this study suggest that the Spanish TASI and M-CHAT-R are valuable tools for the early detection of ASD in Latino children in the United States. Their use can help reduce barriers to autism diagnosis and support equitable access to early intervention and treatment.

413.224 Cross-Cultural Conceptualizations of Autism and Service-Use Decisions in the United States: A Systematic Narrative Review

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Background: Autistic individuals and their families face challenges accessing resources, diagnoses, and services due to several factors including limited autism knowledge, stigma, and a complex healthcare system. Black, Indigenous, and People of Color (BIPOC) individuals face additional barriers related to race and ethnicity, immigration status, and English proficiency.

Objectives: This review bridges a gap in literature through a comprehensive examination of autism in BIPOC families by: a) conducting a systematic narrative review of perceptions of autism and service-use decisions in BIPOC communities; b) discussing the clinical implications of these perceptions and decisions; and c) providing recommendations for more accessible information and care for these communities.

Methods: A comprehensive review of the literature was conducted using *PubMed*, *PsycInfo*, and *Web of Science*. Search terms included variations of “autism” and descriptors for race and ethnicity, alongside terms related to diagnosis and services. Eligible articles were reviewed for key findings. To identify the level of confidence in the results, the Let Evidence Guide Every New Decision (LEGEND) System (Clark, Burkett, & Stanko-Lopp, 2009) was used to evaluate each individual study. This evaluation aimed to determine both the quality of evidence for the overall body of work and for each specific racial/ethnic group.

Results: After screening, 73 articles (51 peer-reviewed, 22 dissertations) were retained and discussed through the Dis/ability and Critical Race Theory (DisCrit) Framework. BIPOC parents sought diagnostic clarity based on knowledge of autism, child development, and cultural expectations. Various etiologies (e.g., environmental, genetic, spiritual/karmic factors) were endorsed, with BIPOC parents overall being more likely to believe their child’s autism was temporary, particularly for immigrant parents. General perceptions of autism were impacted by systemic barriers (e.g., cost, geographic location, language) as well as differing levels of stigma within and outside of their community. Findings showed that applied behavior analysis, speech, and occupational therapies are being utilized across all BIPOC groups.

Unique beliefs emerged among specific racial/ethnic groups: for instance, Asian American families were reluctant to share autism diagnoses with others, including family, due to community stigmatization of autism, and had goals related to their child’s achievement. Black caregivers discussed treating their autistic child like any other child and strived to protect them from racism and ableism. Latine immigrant families were less likely to recognize and report symptoms, including speech delays, due to differing cultural expectations for development. Middle-Eastern/North-African (MENA) families did not widely endorse systemic barriers, implying they may be experiencing autism services differently than other BIPOC groups. Native parents felt health professionals lacked an understanding of their culture, which deterred them from accessing services.

Conclusions: Understanding the nuances of autism conceptualization is essential for ensuring that BIPOC autistic individuals and their families are respected, and their experiences acknowledged when planning/using services. This requires that providers not only be empathetic and culturally sensitive, but also be thoroughly informed about autism and its symptoms to effectively accommodate different knowledge levels across groups. This review highlights the need for continued research examining marginalized communities’ shared and unique perspectives to better inform accommodations and care.



413.226 Cultural Responsiveness of Autism Interventions: A Systematic Review of Adaptation Strategies

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Background: Autism interventions, primarily developed in Western contexts, often lack the cultural sensitivity needed to be effective with diverse populations. With increasing recognition of the importance of culturally responsive interventions, there is a need to explore how interventions and programs for autistic individuals across all ages are adapted to fit diverse cultural, linguistic, and social contexts. This systematic review addresses this gap by examining the strategies used to adapt autism interventions developed in Western contexts for diverse populations.

Objectives: The main objectives of this review are: (1) to identify existing research on the cultural adaptation of EBPs for autism since 2001, and (2) to explore the methods, strategies, or frameworks employed to facilitate these adaptations for diverse populations.

Methods: A systematic literature search was conducted using electronic databases including Academic Search Premier, APA PsycINFO, Education Source, and Psychology and Behavioral Science. Search fields were: (1) cultur* adapt* OR culturally sustain* OR culturally respons* OR CSP; (2) evidence-based practice* OR ebp, or evidence based or best practice OR intervention OR curricul* OR high leverage practice and (3) autism OR asd OR autism spectrum disorder OR PDD* OR Asperger OR Childhood Disintegrative Disorder. The search yielded 342 articles and after screening titles, abstracts, and full texts, 22 articles were selected for inclusion. The included articles met the following inclusion criteria: empirical article published in 2001 or after written in English or Spanish; conducted in or outside the U.S.; include individuals with autism across all ages as focal participants; include a description of an intervention or program originally designed in the U.S., that is being culturally adapted by healthcare or educational professionals, and delivered at a school setting, daycare, pre-K setting, home-based intervention, or community-based settings. Descriptive coding was used to classify the adaptation strategies and the degree to which cultural components (e.g., language, metaphors, social norms) were integrated.

Results: The review exhibits several strategies for cultural adaptation. Translation of materials, including intervention manuals and handouts, was the most common adaptation (n = 15). Some studies also incorporated back-and-forth translation to ensure linguistic and cultural accuracy.

Collaborative work with community members, caregivers, and local professionals played a crucial role in ensuring cultural relevance in seven articles. Interviews, focus groups, and surveys were used to gather insights on local social norms and participants’ language preferences.

Additionally, five pilot studies used feedback to refine adaptations before broader implementation. The Ecological Validity Framework (EVF) was employed in five studies, guiding the adaptation process across dimensions such as language, context, and metaphors.

Conclusions: Cultural adaptations of autism interventions are essential when implementing them with diverse populations. The strategies identified in this review demonstrate a growing recognition of the importance of cultural responsiveness. However, there is a need for more systematic approaches and rigorous reporting of cultural adaptation processes. This review contributes to understanding how interventions can be tailored to diverse populations and to provide pragmatic and effective ways to implement adaptations in practice. Additionally, this review offers practical insights for future research in autism interventions globally.

413.227 Culturally Adapted Social Communication Interventions for Autistic Individuals: A Systematic Review and Quality Appraisal

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Background: Social communication interventions to support autistic individuals are primarily developed and tested in Western countries with predominantly White, English-speaking participants. This limits the generalizability of these interventions to diverse cultural groups and underserved communities, both within and outside Western countries. Cultural adaptation becomes necessary when there is an intervention-consumer mismatch, i.e., when the originally developed intervention is not relevant to a specific cultural group. Although numerous frameworks have been developed to culturally adapt interventions for diverse ethnocultural groups, the quality of these adaptations is not well understood. Understanding key aspects of cultural adaptations - what, when, why, how, and by whom - can ensure methodological rigor and allow for examination of the impact of cultural adaptations on intervention outcomes.

Objectives: This review sought to identify which social communication interventions designed for autistic individuals have been culturally adapted and to identify frameworks that researchers have used to guide their cultural adaptation process. This review also aimed to evaluate the quality of cultural adaptations of social communication interventions for autistic individuals using the Cultural Adaptation Checklist (CAC; Lee et al., 2023). The CAC was developed to not only serve as a tool to culturally adapt intervention programs intended for diverse and/or marginalized populations, but also to systematically appraise the quality of cultural adaptations.

Methods: This systematic review was pre-registered on PROSPERO (CRD42024531743). Searches were conducted in eight databases (ERIC, CINAHL, EMBASE, PsychINFO, MEDLINE, Scopus, Web of Science, and Nursing and Allied Health) to identify culturally adapted social communication interventions for autistic individuals delivered by professionals. The methodological quality of the studies was assessed using QualSyst, and the data were analyzed through narrative synthesis.

Results: 16 studies involving a total of 474 participants met the inclusion criteria. Included studies reflected seven different culturally adapted interventions delivered across 12 countries in 11 languages. All studies had at least adequate methodological quality, but only three reported using a specific framework to guide the cultural adaptation process. The quality of cultural adaptations varied, with fulfillment of CAC items across studies ranging from 44% to 91%. The CAC context dimension (i.e., cultural adaptation of the intervention environment) was the most frequently addressed across studies and the methods dimension (i.e., cultural adaptation within intervention planning and procedures) the least.

Conclusions: The current review highlights the need for an increased number and improved quality of cultural adaptations to best support the global autistic community. In particular, there is a need for further attention to the full range of cultural adaptations in future research; the CAC offers a useful framework to facilitate this process. Future research should focus on exploring to what extent, and which types of cultural adaptations are needed to achieve desired intervention outcomes.

413.228 Culturally Responsive Strategies for Autism Interventions in Adulthood in Real-Life and through Virtual Settings

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Background:

Autism research is increasingly focused on developing personalized interventions tailored to individual needs; however, cross-cultural perspectives remain underrepresented. Additionally, there is a significant gap in effective and validated social skills interventions and communication outcomes for adults, both in In-Real-Life settings and through virtual reality (Monahan et al., 2021). In fact, autistic adults represent an underserved neurodivergent population within society (e.g., Laugeson et al., 2015). This gap suggests the need for interventions that specifically address the social needs of adults in real-world contexts (Balderaz, 2020), as current studies predominantly center on children and adolescents (e.g., Oh et al., 2021).

Objectives:

We engaged both autistic and neurotypical psychologists and psychotherapists to gather insights for creating a personalized (virtual) intervention for autistic young adults (L1, ages 18-40) using their clinical expertise. Our goal was to also integrate and compare Italian data with data from other countries to identify any cultural influences on intervention strategies.

Methods:

Following initial desk research, we conducted nine semi-structured focus groups with Italian professionals who work with autistic young adults (18-40 y.o.) in different regions (Veneto, Trentino, Lazio). In parallel, we conducted individual in-depth interviews with professionals from other countries (e.g., U.S.A., Australia). All qualitative data are analyzed using a mixed thematic analysis approach (Braun & Clarke, 2023), employing NVivo coding software by QSR. Two independent coders were assigned to ensure data reliability. For robustness, we triangulated the data through both theoretical and investigator approaches.

Results:

Findings reveal a range of insights, from professionals' perceptions of autism and neurodiversity to effective strategies for social skills development. Key elements needed to create a virtual environment tailored to individual needs have been identified. Discussions also touched on potential challenges and solutions for implementing virtual reality interventions, and best practices to support this population also in real life. Additional topics emerged organically from group conversations, underscoring the value of cross-regional and cross-cultural perspectives.

Conclusions:

This study includes step-by-step guidelines to implement virtual reality interventions, actionable strategies to address potential challenges, and best practices for supporting autistic young adults in In-Real-Life and in virtual settings. Overall, findings indicate that developing interventions based on individual interests, sensory preferences, and social needs can significantly improve social skills and overall well-being. Further research should implement these guidelines and investigate their effectiveness through quantitative data analysis.

413.229 Development of a Cross-Culturally Validated Measure of Autism Knowledge (PAK-M) with a Neurodiverse Team: Exploration of Items across Cultures and Levels of Expertise

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Background: Greater knowledge about autism is associated with reduced stigma and increased societal acceptance of autistic individuals, making it essential to accurately measure autism knowledge. Sensitive measures are crucial for evaluating educational programs' impact and understanding people's misconceptions. However, existing tools often lack cross-cultural validity, contain ambiguous items, and use response formats that limit their utility. This project aims to develop a more inclusive, valid measure to address these issues.

Objectives: This study aims to adapt the Participatory Autism Knowledge-Measure (PAK-M), originally developed with input from autistic individuals in the US, to 1) address community members' priorities, 2) be culturally valid, 3) distinguish between varying levels of expertise and, 4) demonstrate strong psychometric properties.

Methods: The iterative adaptation process of PAK-M has thus far involved nine datasets and five item sets, with data from 2,888 participants, including undergraduate students, clinical professionals, and the general public from South Korea and the US (Table 1). To establish content validity, a team of autistic and non-autistic researchers rated each round of items. Final item selection retained the best-performing items, focusing on reducing ambiguity and grounding items in research evidence. The first four datasets initially used a 5-point Likert scale but later versions explored True/False responses with confidence and importance ratings. Versions ranged from 27 to 92 items. We calculated internal consistencies using Cronbach's alpha and examined ceiling effects by calculating the percentage of participants who got each item correct. We also examined how different scoring systems were correlated and analyzed the relationships between confidence, importance, and accuracy.

Results: Internal consistency for the 5-point Likert scale ranged from .50 to .88, True/False from .41 to .57, and confidence ratings from .93 to .98. Among the general public, no items reached a ceiling effect, while among speech pathologists, ceiling effects ranged from 8% to 30% of items, suggesting the scale captures expertise well. Average correctness per item varied from 50% to 83%, highlighting gaps in autism knowledge. In American samples, reverse-coded items had higher internal consistency than non-reversed items, whereas in Korean samples, reverse-coded items showed lower consistency. In the most recent data, we compared responses using an Agree/Disagree binary option with a Likert-based importance rating to a True/False binary with a Likert-based confidence rating. We found significant correlations between confidence and importance ratings in 17 of 56 items after Bonferroni corrections. True/False and Agree/Disagree responses were strongly correlated ($r = .73, p < .001$), but not identical.

Conclusions: The process of refining the PAK-M involved selecting items and refining their phrasing to capture expertise and ensure clarity and research support across the measure. Findings reveal variations in internal consistency due to differences in response scales, item phrasing, cultural background, constructs measured, and clinical training. Ceiling effects suggest that the measure requires further refinement, especially to identify appropriate response options, differentiate knowledge of the text of the diagnostic criteria from knowledge of (continuously updated/improved) research findings, address cross-cultural differences, and develop a reliable and valid measure of autism knowledge.

**413.230** Disparities in Autism Classifications: Racial and Ethnic Differences in Special Education Designation over Two Decades
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Background: Recent prevalence studies indicate a resurgence of racial and ethnic disproportionality in autism, highlighting complex temporal and spatial variations. Understanding these patterns is crucial for identifying factors contributing to shifts in autism prevalence.

Objectives: This study explores racial and ethnic disparities in autism prevalence over two decades, using data from three National Longitudinal Transition Studies (NLTS). We examined: 1) changes in the educational labels assigned to students with a medical diagnosis of autism over time, and 2) the disparities in these changes across different racial and ethnic groups.

Methods: We conducted a secondary data analysis using the SPSS Complex Samples module, focusing on the percentage distribution of educational labels over time as reported in the longitudinal NLTS data. The NLTS surveys have documented a significant increase in the number of students with a clinical diagnosis of autism studied over time: from 40 in the original NLTS to 1,020 in NLTS2, and 1,710 in NLTS2012.

Results: Analysis reveals that students diagnosed with autism are often categorized under various special education categories including autism, other health impairments, intellectual disabilities, speech and language impairment, and emotional disability (see Figure 1). From 2001 to 2012, there was a decrease in all racial groups being formally recognized under the autism special education category, with representation stabilizing at approximately 52% across White, Hispanic, Black, and Asian groups as shown in Figure 2. In 2001, a significantly large proportion of Hispanic students with a medical diagnosis of autism were more likely classified under intellectual disability (ID) and speech and language impairment (SLI) categories. While these proportions decreased by 2012, a significant number remained classified under the ID and specific learning disability (SLD) categories. NLTS2 data from 2001 showed that a relatively larger percentage of Black students clinically diagnosed with autism were placed in the emotional disability (ED) and SLD categories. By 2012, there was an increase in the other health impairment (OHI) category designation for this demographic, with a considerable portion persistently classified under the ID category. Although sample sizes for Asian students were limited, it was noteworthy that in 2001, those clinically diagnosed with autism were significantly more likely to be categorized under the autism label for special education purposes. By 2012, this trend had decreased dramatically, aligning the proportion with that of other groups.

Conclusions: The study suggests that racial disproportionality in the autism category in special education has diminished over time. However, notable disparities in special education categorizations, especially in SLD and ID, and OHI designation, persist across different racial and ethnic groups despite changes over time.



413.231 Evaluating the Effectiveness of a Training for Caregivers on Using Read and Remove, Ask, Answer, Prompt (R2AAP) Strategy during Shared Adapted Book Reading with Their Children with Autism Spectrum Disorder (ASD).

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Background: Children with autism often face significant communication challenges, emphasizing the crucial need for effective interventions, particularly in early childhood (Reichle et al., 2016). Augmentative and alternative communication (AAC) has emerged as a vital support for individuals with complex communication needs (CCN) such as autism (ASHA, 2009).

Caregivers' active involvement in communication training programs is pivotal, such as what has been demonstrated with strategies such as Read, Ask, Answer and Prompt (RAAP) during shared book reading (Kent-Walsh, Binger, & Hasham, 2010). Read, Ask, Answer, Prompt (RAAP) is an evidence-based storybook reading instructional strategy that uses a least-to-most prompting procedure to teach language support strategies to communication partners (Kent-Walsh, Binger, & Malani, 2010). The RAAP strategy has displayed promising effects on parent strategy use during instructional programs and has improved the communication skills of children who use AAC during shared book reading activities (Dodge-Chin et al., 2022).

Adapted books are modifications that are made to books to make them easier to access and more interactive for children. The current study adapted books to have removable picture elements in it. For example, an illustration of a dog in the book may be photocopied, laminated, and attached to the book by Velcro; the caregiver can then physically manipulate this picture element.

The purpose of the current study was to evaluate the effectiveness of an online training for caregivers on using adapted books during interactions with their children with autism. Specifically, caregivers were trained on using adapted books and implementing the R2AAP strategy. The R2AAP strategy stands for: Read and Remove, Ask, Answer and Prompt. The study aimed to answer the following research question: what is the impact of training caregivers on using adapted books during interactions with their children with ASD and complex communication needs (CCN). A total of three caregivers participated in the training, two from the US and one from Sri Lanka.

Objectives: To determine the effectiveness of an online communication partner training on caregivers' ability to use R2AAP strategy during adapted book reading with their children with autism.

Methods: Single subject multiple probe across participants design.

Results: All three caregivers implemented the R2AAP strategy between 50% to 100% of the time while reading adapted books with their children. They all implemented the strategy at or above the mastery criterion that was set for the study.

Conclusions: The current study presents an innovative training model that is self-paced and online at the convenience of caregivers. A unique aspect of this study is the cross-cultural component of having implemented the training with caregivers across two different countries, the United States and Sri Lanka. Although, these countries differed significantly in terms of context and resources this type of an online training indicated the potential to be successful across both contexts. In addition, there is currently no research on using adapted books with children on the autism spectrum. The interactive elements and movement of the adapted books could lend itself to support communication and engagement for children with autism.



413.232 Examining a Decade of Changes in Autism Identification and Inclusion By Race and Ethnicity in California Education System

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Background: The number of children on the autism spectrum receiving special education services in public schools in the United States has increased exponentially. Disparities exist in autism identification and service access in public schools. Over- or under-identification of autism may limit access to appropriate services and requires ongoing investigation.

Objectives: This study examined racial and ethnic differences in autism identification, general education inclusion and service access in California education system and examined trends in autism identification by race and ethnicity in special education from 2008 - 2018.

Methods: The secondary data analyses were based on data obtained from a publicly available database (DataQuest) or provided by the California Department of Education. Various student counts by race and ethnicity, educational identification, and special education services were collected. The likelihood of being in a certain group was indicated by the risk ratio (RR). A p-value and 95% confidence interval for each risk ratio were computed based on a normal approximation (Jewell 2004); a significant p-value (<0.05) indicates a RR different from 1.

Results: Asian (RR = 1.24), Black (RR = 1.28), and White students (RR = 1.17) had elevated likelihood of meeting an educational eligibility for autism than others ($p<0.001$). Hispanic/Latinx (RR = 0.71, 95% CI=0.71-0.72) and Native Hawaiian or Other Pacific Islander students (RR = 0.75, 95% CI=0.69-0.83) were less likely to receive autism identification as the primary condition. Black autistic students were less likely to be included in general education settings (RR = 1.60 when LRE was Less than 40%; RR = 2.19 for Separate School). The under-representation in Native Hawaiian or Other Pacific Islander students was evident in all six educational services examined compared to their peers (behavioral intervention services, individual counseling, language and speech therapy, mentoring, occupational therapy, specialized academic instruction), although mentoring was not significantly different than other groups (RR=0.60, 95% CI=0.35-1.04) and the under-representation in Hispanic/Latinx students was seen in five out of the six services examined. The risk ratios in all groups, except in White students, have increased over the years (see Figure 1).

Conclusions: While progress has been made in reducing disparities in autism identification, significant challenges persist. Addressing these disparities requires a comprehensive effort that involves policy changes, practitioner training, and ongoing research to ensure that all students, regardless of their racial and ethnic background, have equal access to appropriate services and educational opportunities.



413.233 Feasible Solutions: Ensuring Autism Care Access for All

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Background:

Autism care access remains a significant challenge in many regions, particularly in underserved areas. Disparities in training, resources, and support systems further exacerbate these challenges, making it difficult for professionals to provide adequate care for autistic individuals. The ECHO Autism community, spanning North, Central, and South America, seeks to address these barriers by offering standardized, scalable training programs that equip healthcare providers with the skills and confidence to improve autism care access in their local contexts. In 2023, a new standardized metric for evaluating ECHO Autism programs was introduced to assess the impact of ongoing training ECHOs across different regions, focusing on key factors such as self-efficacy, barriers to care, and practice changes among participants.

Objectives:

- To evaluate the effectiveness of ECHO Autism training programs in increasing self-efficacy among healthcare providers across the Americas.
- To assess regional differences in barriers to autism care and identify how these barriers evolve following program participation.
- To compare the impact of training programs in Latin America (LATAM) and the United States (US) by examining changes in participants' practices and their interactions with autistic individuals.

Methods:

Participants in ECHO Autism programs across North, Central and South America were asked to self-report their demographics, self-efficacy, barriers, and changes in practice in survey form. Data were collected prior to and following attendance in ECHO programs from 2023-2024. Results were aggregated and visualized for comparison and assessment.

Results:

There were 979 responses to LATAM surveys and 741 responses to US surveys. Psychologists were the largest group of participants in LATAM programs (22%), whereas physicians made up the largest proportion of US program participants (31%). Prior to attending, 25% of LATAM program attendees had no training in Autism compared to 21% of attendees in US programs. Following participation, all respondents indicated either no change or an increase in the number of autistic individuals they interact with (LATAM n=108, US n=116). In general, LATAM participants indicated all barriers were more severe than US participants, and US participants indicated a larger decrease in severity of barriers in comparison to LATAM participants. Participants in both LATAM and US indicated an increase in self-efficacy and high satisfaction with the program(s) they attended.

Conclusions:

The results demonstrate that ECHO Autism training programs are effective in improving self-efficacy and reducing barriers to autism care across diverse regions. While significant progress was made, regional differences suggest that barriers to care remain more pronounced in Latin America, highlighting the need for continued focus on addressing these challenges. Nonetheless, the increase in interactions with autistic individuals and the high levels of satisfaction among participants in both regions underscore the value of these programs in fostering more inclusive, informed autism care practices.

413.234 From Conferences, Consultations to Care: Outlining Autism Trends in Nigeria

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Background:

Despite global advancements in ASD awareness, Nigeria faces challenges in translating awareness into care due to cultural stigma, economic constraints, and limited medical infrastructure. Since 2011, the annual Guaranty Trust Holding Company (GTCO) Autism Conference has sought to bridge this gap by providing two days of presentations followed by a five-day consultation period, where specialists offer diagnostic and therapeutic guidance to Nigerian families. The conference has grown in attendance from 300 in 2011 to 6,000 in 2024 (hybrid). Attendees include parents, caregivers, educators, and professionals, but the long-term outcomes on sustainable care remain uncertain.

Objectives:

This study evaluated whether the rise in Autism-related conferences in Nigeria has improved care or primarily served as awareness platforms to families. Additionally, we explored the role of the GTCO Autism Conference in lowering barriers to knowledge and care, and examined obstacles families face. Lastly this study proposed strategies to better align awareness efforts with hands-on interventions that lead to lasting improvements.

Methods:

This study is based on narrative and case study analysis, drawing from parents, advocates, and active collaborators experiences at the GTCO Autism Conference over the past 14 years. We collected qualitative data through informal and formal discussions with 30 parents, professionals, and other participants recruited via purposeful sampling. Data was gathered through surveys, questionnaires, observations, and interviews. Our thematic analysis incorporates reflections on conference structures, session formats, and content presented by both local and international experts. We focused on identifying the tangible benefits provided to families during the event and the sustainability of those benefits post-conference.

Results:

Our findings reveal a complex picture of the role of autism-related conferences in Nigeria. While the GTCO Autism Conference successfully raised awareness and reduced social stigma, bringing together diverse stakeholders, its direct impact on improving ongoing care remains limited. Families reported significant benefits from the diagnostic consultations and expert advice provided during the five-day consultation period, as they received immediate guidance and coping strategies for managing ASD. However, many struggle to access continuous support after the event, and lack resources for follow-up care. Despite growing awareness, gaps remain, such as a shortage of local service providers trained in autism care, limited funding for community-based programs, and insufficient policy support for ASD services. Consequently, while families leave conferences with valuable information, they often struggle to implement sustainable care solutions, limiting the long-term outcomes.

Conclusions:

There is a pressing need to transition from awareness-focused events to initiatives providing continuous support for families dealing with ASD in Nigeria. While conferences such as the GTCO Autism Conference play a key role in raising awareness and offering temporary support, they must be complemented by scalable, long-term interventions. We propose that policymakers, healthcare providers, and educators collaborate to develop community-based interventions that extend beyond conferences. Integrating Autism Speaks' Caregiver Skills Training into the autism conference framework could equip families with practical skills applicable at home and in their communities. Additionally, establishing regional support groups or resource centres could provide ongoing assistance and reduce reliance on annual events for ASD care.

413.235 Globalizing the Boscc: Adaptation, Training, and Implementation in India's Low-Resource Context

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Background:

The Brief Observation of Social Communication Change (BOSCC) is a play-based, video-coded assessment designed to detect subtle changes in social-communication behaviors. It involves semi-structured play sessions between a child and an adult (typically a researcher). Reliability training and inter-rater consistency are essential for accurate implementation. BOSCC has been validated for minimally verbal individuals (Module 1/MV) and phrase speech/young fluent individuals (Module 2/PSYF). Developed in high-income country, its application in low- and middle-income countries (LMICs), such as India, must consider cultural and contextual differences. This study explores barriers and facilitators to BOSCC implementation within the Communication-centred Parent-mediated treatment for Autism Spectrum Disorder in South Asia (COMPASS) trial in India, which recruited 261 autistic children, aged 1-9 years. BOSCC assessments were conducted at three time points, totalling 547 MV and 151 PSYF assessments.

Objectives:

1. To examine the adaptation process of BOSCC for LMIC use, focusing on training, assessment administration, and reliable coding.
2. To investigate challenges and facilitators encountered during implementation, providing insights for broader application in low-resource environments.

Methods:

Sample: The study involved 26 participants, including 4 team members responsible for training and supervision, 16 involved in BOSCC administration, 3 engaged in coding, and 3 who did not achieve coding reliability. Data collection and analysis are currently ongoing, with preliminary insights guiding the adaptation process and informing further iterations.

Measures: A structured, open-ended questionnaire was administered to capture reflections on BOSCC implementation experiences, including challenges, adaptive strategies, and recommendations for enhancing cross-cultural applicability. Feedback was also collected from team members who did not achieve coding reliability, focusing on specific difficulties encountered.

Analysis: Thematic analysis summarized experiential data regarding facilitators and barriers to BOSCC implementation, as well as adaptations made to maintain coding effectiveness while ensuring confidentiality.

Results:

Preliminary data indicated that while the core training process for BOSCC remained unchanged, additional training was required to align team members with the prescribed interaction style. Guidance was specifically needed for transitioning from directive to non-directive, child-led play, which is less familiar in traditional Indian contexts. Supportive supervision emerged as a critical facilitator, ensuring high-quality implementation. Varying levels of experience among team members and exposure to participant population were notable barriers. These were mitigated through structured supervision and continuous support, which fostered skill development and confidence. Feedback from coders highlighted the need for clearer decision-making frameworks to enhance coding reliability. Coders took 3 to 5 months to achieve reliable assessments, primarily due to discrepancies in interpretation and limited familiarity with specific cases. Weekly supervision sessions facilitated ongoing discussions to clarify complex concepts, with relevant video resources suggested to enhance understanding.

Conclusions:

This study provides insights into the challenges and facilitators of implementing BOSCC in low-resource settings like India. The findings regarding training, cultural adaptation, and barriers offer valuable lessons for future BOSCC applications globally. Further research should explore the broader applicability of these adaptations in other LMIC settings, potentially expanding BOSCC as a measure for assessing social communication changes in ASD interventions.

Poster Session**414 - Interventions - Social, Cognitive, Behavioral and Educational - Preschool & Infant I**

May 1st, 2025, 5:30 PM - 6:30 PM - Hall 4A

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414.236 A Father-Implemented Enhanced Milieu Teaching Intervention for Young Children with Autism Delivered Via Telehealth Practice-Based Coaching

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Background: Individuals with autism spectrum disorder (ASD) experience deficits in social communication skills, but the literature suggests that addressing early communication at a young age can result in a myriad of positive outcomes later in life. Early intervention and intensive applied behavior analysis therapy have become commonplace for many, but those supports are costly and may not be accessible to all. Additionally, even for those that do have access, an emphasis is being placed on caregiver-mediated interventions (CMIs) that can be implemented outside of sessions with service providers. Research indicates that CMIs can help children generalize skills to routines and contexts within their natural home environment. CMIs that directly target natural play routines, such as Enhanced Milieu Teaching (EMT), have been repeatedly implemented successfully by caregivers to improve both caregiver implementation outcomes and child expressive communication.

Objectives: Despite the benefits, most CMI interventions for children with ASD have been delivered primarily to mothers, although fathers have reported that they also want access to supports. Barriers that prevent all caregivers from engaging in CMIs are extensive, but additional hurdles exist for fathers, including providers not prioritizing their access to relevant information, inflexible in-person session hours, and provider biases. Many of these barriers can be addressed through the use of modifications and telehealth service delivery. This study aimed to explore the effectiveness of a father-mediated telehealth EMT intervention delivered via a collaborative practice-based coaching (PBC) partnership.

Methods: We incorporated modifications of typical caregiver-mediated interventions to meet the specific needs and desires of fathers, including short weekly coaching sessions over Zoom, flexible scheduling inside and outside of traditional business hours, initial background information on ASD and the principles of operant conditioning, a focus on typical father-child play routines, asynchronous supports to supplement coaching sessions, and video training models of fathers acting as the intervention agent. Three father-child dyads completed the study, which utilized a multiple baseline across behaviors design with four intervention tiers to teach separate EMT implementation strategies. Fathers uploaded two 5-min videos engaging with their child in a chosen play routine each week, and implementation fidelity and child expressive communication were coded. Visual analysis of father data and descriptive analysis of child communication were used to determine the effects of the intervention. Additionally, father well-being and ASD knowledge were assessed via pretest and posttest surveys. Participants remained in the study for up to 15 weeks.

Results: Results indicate that fathers can successfully implement the EMT intervention with their children with ASD. As a result of improvements in father implementation, substantial increases in child expressive communication occurred. However, the intervention may not have had an influence on father well-being outcomes, as survey responses were mixed across participants.

Conclusions: This study provides evidence that EMT delivered to caregivers—and particularly fathers—via telehealth-based PBC may be ideal to address the needs of children with ASD and their families.

414.237 A Four-Year Follow-up Study of the Early Start Denver Model in Taiwanese Children with Autism Spectrum Disorder: Preliminary Analysis of the Development of Cognitive, Language and Adaptive Behaviors

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Background:

In recent years, the prevalence of Autism Spectrum Disorder (ASD) has been increasing both domestically and internationally. Early diagnosis and intervention have gained growing attention, and there is an increasing focus on whether the effects of interventions can be sustained over time. However, long-term follow-up studies on early interventions, both locally and globally, remain limited and show inconsistent results. The Early Start Denver Model (ESDM) is an evidence-based, comprehensive early intervention model that integrates behavioral, developmental, and relationship-based approaches. Our team previously conducted a short-term, low-intensity individual-implemented ESDM intervention study (Chiang, et al., 2023), which found that compared to the control group, the ESDM group showed greater improvements in overall Development Quotient (DQ) and non-verbal DQ from pre- to post-intervention. However, these differences did not sustain at the 6-month follow-up. Therefore, it is necessary to conduct a long-term follow-up study to address the issue.

Objectives:

This study aims to follow up with the children from Chiang et al. (2023)'s study four years later to examine their cognitive, language, and adaptive behaviors and to explore whether this individual ESDM intervention has long-term effects.

Methods:

This study employs a quasi-experimental design, with participants being children with ASD who received either individual-implemented ESDM intervention or standard early intervention services between the ages of 2 to 4 (ESDM group and community group). Data collection was conducted at three time points (T1: pre-intervention; T2: post-intervention; T3: 6 months follow-up). Four years after the intervention (T4), both groups (17 participants each, with an average chronological age of 99.05 and 99.30 months, respectively) were assessed on cognitive, language, and adaptive behavior measures. Cognitive and language abilities were assessed using the Mullen Scale of Early Learning (MSEL), Wechsler Preschool & Primary Scale of Intelligence-Fourth Edition (WPPSI-IV), and Wechsler Intelligence Scale for Children-Fifth Edition (WISC-V), with overall DQ and language DQ calculated. Adaptive behaviors were measured using the Adaptive Behavior Assessment System, Second Edition (ABAS-II).

Results:

The interaction between group and time point for cognitive, language, and adaptive behaviors was not significant. Both groups showed improvements in cognitive and language abilities over time. In terms of cognitive ability, the ESDM group showed significant improvements compared to T1, while the community group showed significant improvements compared to both T1 and T3. For language ability, both groups showed significant improvements compared to T1 and T3. In terms of adaptive behaviors, both groups showed a decline, but the magnitude of the decline between time points was not statistically significant.

Conclusions:

The effects of the short-term, low-intensity individual-implemented ESDM intervention on cognitive and language abilities were sustained four years later; however, there were no significant differences compared to the community group. This suggests that early intervention, whether through ESDM or community-based services, has long-term benefits for the children with ASD.

414.238 A Mixed Methods Investigation of Providers' Intent to Use Caregiver-Implemented Reciprocal Imitation Teaching with Children with Social Communication Delays in the Public Early Intervention System

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Background:

Evidence based practices (EBPs) for supporting social communication development among toddlers with a high likelihood of autism are not routinely implemented in community-based early intervention (EI) settings. According to the Theory of Planned behavior, provider factors (e.g., skills, norms, attitudes) impact their *intent to use* a new EBP, which predictive of subsequent implementation. Understanding whether and how providers intend to use an EBP, and predictors of that intent, are important for understanding the scalability of EBPs. Data for this study were obtained in the context of an ongoing hybrid implementation-effectiveness trial ("RISE") of the caregiver-implemented Reciprocal Imitation Teaching (CI-RIT), an early social communication intervention, within the publicly funded Early Intervention system in four US states.

Objectives:

We used a mixed methods approach to understand providers' intent to use CI-RIT, how it might relate to perceived social validity of CI-RIT, how it compares with their usual approach to EI (TAU), and their skill in implementing CI-RIT during the study.

Methods:

Qualitative data: A subset of EI providers who had delivered the CI-RIT curriculum to at least 2 families on their caseload in the research trial ($n = 13$) completed semi-structured interviews about their usual practice, how CI-RIT sessions compare to their usual practice, and their intent to use CI-RIT in the future. Qualitative data were analyzed using a rapid qualitative analysis approach (Hamilton, 2013) in which transcripts were summarized and consolidated in a descriptive matrix (Averill, 2002) prior to thematic analysis. Four researchers independently reviewed the data matrix and developed themes, and themes were then compared and consolidated into a final set of themes by the lead author.

Quantitative data: Providers completed the CI-RIT Social Validity Scale and two items on future intent to use 12 months after enrolling in the study, with all items rated from 1 (low) to 7 (high). Fidelity of implementation of CI-RIT was also rated on recorded videos of early intervention sessions. All three measures were available for 27 providers; data collection is ongoing.

Results:

A description of qualitative themes and subthemes are presented in Figure 1 and Table 1. Primary themes were that (1) Usual care is less structured and focused than CI-RIT, and that providers described (2) Intent to use in a condensed, piecemeal, or general way. In a mixed methods analysis, splitting interviewees by their perceptions about social validity and observed fidelity ratings (above/below median) did not indicate meaningful differences in intent to use. Finally, in our preliminary quantitative analysis, mean intent to use was high ($M=6.18$, $SD=.67$) and perceived social validity was significantly correlated with intent to use ($r = .472$, $p = .013$) while fidelity of implementation was not ($r=.232$, $p=.244$).

Conclusions:

While providers in our sample tended to rate their intent to use CI-RIT very highly on a Likert rating, qualitatively, they rarely planned to implement the intervention as intended and rather described incorporating some general principles that they indicated were a change from their usual practice.

**414.239 A Pilot Trial of the Social ABCs in Israel**

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Background: Studies have demonstrated that autistic children can exhibit delay in language development and social-communication skills (Brian et al., 2015). The Social ABCs, a parent-mediated intervention for toddlers originally developed in Canada (Brian et al., 2016), targets early functional verbal communication and positive affect sharing in the context of play and caregiving activities.

Objectives: The aim of the current pilot study was to evaluate the impact of the intervention in Israel on various child and parent variables, using both standardized tools and questionnaires.

Methods: Participants were 17 autistic children aged 19-39 months ($M=26.4$, $SD = 5.61$; 94.1% male) who participated in the Social ABCs in two sites in Israel. The current study followed the group Social ABCs protocol, which includes 6 online parent group sessions, and 9 frontal coaching parent-child sessions. Children were administered a gold-standard evaluation prior to the intervention and 6 weeks after completion of the protocol. Relevant measures included assessments of autism symptom severity (ADOS-2); developmental screening (Communication and Symbolic Behavior Scales Developmental Profile; CSBS-DP), lexical capacity, (Hebrew Communicative Development Inventory (HCIDI); parenting stress (PSI-SR), and aberrant behaviors (ABC).

Results: Of 25 families who met inclusion criteria, 20 (80%) elected to participate in the intervention program, and 17 completed the intervention. Parents rated the intervention as highly satisfactory ($M=33.13$, $SD = 2.78$, of a maximum score of 35). Children's vocabulary increased significantly from pre- to post-intervention both for expressive ($t(14)=-4.11$, $p=0.001$) and receptive vocabulary ($t(14)=-3.94$, $p=0.002$) with large effect sizes ($d>1.0$). We found no statistical change in the ADOS Social Affect Calibrated-Severity-Score, but significant gains were observed both for the social ($t(14)=-2.90$, $p=0.012$) and speech composites ($t(14)=-2.20$, $p=0.045$) of the CSBS-DP. A significant decrease in parenting stress scores occurred in the Parent-Child Dysfunctional Interaction (PCDI) subscale ($t(16)=3.25$, $p=0.005$), indicating lower stress during parent-child interaction. ABC scores showed a significant decrease in the Social Withdrawal subscale ($t(16)=2.42$, $p=0.028$), indicating increased social involvement of the child.

Conclusions: This study provides evidence that the Social ABCs is feasible, acceptable, and satisfactory in Israel. In the current pilot study, improvement was noted in child social functioning and language development, and reduced reported dysfunctionality in parent-child interactions.

414.240 A Preliminary Study of the Impact of Very Early Intervention with Esdm for ASD on Sensory Problems

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Background:

The Early Start Denver Model (ESDM) is a Naturalistic Developmental Behavior Intervention (NDBI) that uses natural reinforcers in child-selected activities. ESDM follows a manual (Rogers & Dawson, 2009). Curriculum checklists are used to provide a comprehensive view of a child's development in various domains (receptive communication, expressive communication, social skills, cognition, play, fine motor, gross motor, and personal independence).

Regarding the evidence for ESDM, Dawson conducted the world's first randomized controlled trial (RCT) of a very early intervention for ASD in 2010, showing that ESDM improves intellectual function, including language function, and prevents the deterioration of adaptive behaviour (Dawson, Rogers, Munson et al., 2010).

The Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) was used as the diagnostic criteria for ASD in the study. However, the DSM-IV does not include sensory problems to criteria for ASD, therefore sensory assessment was not performed in clinical studies of ESDM.

Objectives:

The aim of this study is to investigate whether ESDM has a positive effect on sensory problems in ASD.

Methods:

We compared the intervention and control groups to see if there were any changes in scores on the Japanese version of the Infant Sensory Profile (ITSP) before and after the ESDM intervention. Children aged 19-36 months attending outpatient clinics at medical institution, 17 children who had been implemented with ESDM (intervention group) and 14 children who had not been implemented with ESDM (control group). Both group were administered the ADOS-2, the new version of the K-type Developmental Test 2020, and the Vineland-II adaptive behavior scale and there was no significant difference between the two groups. ITSP was administered before the start of ESDM (Pre) and after 60 minutes of individual therapy with parent once a week for 6-9 months (Post), and the differences in ITSP scores between Post minus Pre were compared between groups. The Mann-Whitney U test. EZR (version 1.63) was used for statistical analysis (Kanda, 2013), with a risk rate of 5% as statistically significant and 10% as a significant trend.

Results:

All of the subjects in this study had been diagnosed with ASD, and the results suggest that atypical sensory processing can be seen in children with ASD from as early as 36 months of age.

The results showed that among the four quadrants of ITSP, the change in sensation avoiding ($U = 73.5, p = .073$) tended to be statistically significant in the control group. The analysis of each sensory processing in that same group showed a significant difference in oral sensory processing ($U = 69.5, p = .05$) as well as a significant trend in tactile processing ($U = 74.5, p = .080$).

Conclusions:

Future research should focus on examining sensory evaluation at an objective behavioral level to accumulate more findings. The ITSP evaluation method measures highs and lows with an emphasis on averages; therefore, analysis should incorporate both quantitative and qualitative methods. Further studies are needed to explore the effects of very early intervention with ESDM on sensory problems and to compare these effects with other measures.

414.241 An Expert Panel to Identify Essential Support Strategies to Promote Autistic Preschoolers' Language Skills

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Background: Previous research has identified several barriers for practitioners implementing evidence-based practices (EBPs) with autistic students. These barriers include practitioners reporting that existing EBPs are too complicated, not clearly defined or described, and lack feasibility within the real-world context (Barry et al., 2020). Thus, we must identify, define, and guide early childhood educational teams on essential support strategies they should adopt and deliver to promote language outcomes for autistic preschoolers (Damschroder et al., 2009). Essential support strategies—called core components or active ingredients—are the observable, discrete, indispensable elements, strategies, and intervention mechanisms essential for change that may stand alone or be present within established EBPs (Blase & Fixsen, 2013). To date, however, no systematic investigations have sought to identify these essential support strategies for promoting language in autistic preschoolers.

Objectives: Our investigation aims to identify a simplified, preliminary set of essential support strategies that promote the language of autistic preschoolers using an electronic Delphi Method (McMillan et al., 2016).

Methods: We are engaging an expert panel in multiple rounds of information gathering to narrow the field of support strategies and reach a consensus on those deemed most essential. Our 28 panelists are early childhood researchers ($n=13$) and practitioners ($n=15$); three identify as autistic. All panelists have expertise and at least five years of experience in early language development, autism, and implementing evidence-based language practices for autistic preschoolers in the classroom. Our research team represents researchers and practitioners with expertise in researching and implementing EBPs with autistic preschoolers; two identify as autistic.

There are three rounds of asynchronous data collection, with data analysis by our team between each round (see Figure 1). For Round 1, we created an online survey in which experts generated an exhaustive list of essential support strategies, defined them, and provided examples. Our experts generated 376 essential support strategies, which our team coded using conventional content analysis procedures (Hsieh & Shannon, 2005). We narrowed the list to 96 unique support strategies that anonymously reflect all experts' suggestions and integrated definitions from the literature when available.

For Round 2, we created another online survey and asked panelists to review the consolidated list of 96 support strategies and their definitions. They reviewed a table with the frequency with which the strategy occurred (e.g., experts mentioned *visual supports* 55 times). Table 1 provides a sample of the strategies, definitions, and frequency. Panelists then rated and ranked the support strategies to narrow the field to those most essential.

Results: Our panelists completed Round 2. We are analyzing and summarizing the data in preparation for Round 3, where we will ask panelists to narrow down the strategies and definitions in another online survey. We expect the third and final round of data analysis in January 2025; we will present the full E-Delphi results at INSAR.

Conclusions: Educational teams must know which strategies are essential to use in the classroom to promote the language of autistic preschoolers. To facilitate this process, we will share our panel's final recommendations and facilitate a conversation with attendees.



414.242 Association between Parent-Child Joint-Engagement States and Parents' Implementation of Incredible Years® (IY-ASLD) Strategies

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Background:

Autism Spectrum Disorder is categorized by differences in social communication and reciprocity and repetitive and/or restrictive behaviors and interests. The Incredible Years® Parent Program is a group-based parenting curriculum that was developed to reduce parental stress and improve wellbeing, foster parents' use of developmentally appropriate strategies and improve children's social-emotional development for children with disruptive behaviors (Webster-Stratton et al., 2001). A new version of this program (Incredible Years-ASLD®; Webster-Stratton et al., 2018) was adapted for parents of children with ASD and/or language delay. Given that IY-ASLD strategies are designed to sustain positive parent-child interactions, an important question is whether these strategies are temporally related to the parent-child dyad's joint engagement states.

Objectives:

Little research has assessed whether parent-child engagement states are related to parents' implementation of IY-ASLD® behavioral strategies. This study aims to investigate the relationship between parents' use of IY-ASLD behavioral strategies and joint engagement states of the dyad. These findings will help elucidate discrete strategies that may help sustain the interactions of parents and their autistic children.

Methods:

Parents (n=17) of preschool aged children who met criteria for ASD (Child Autism Rating Scale-2) and/or language delay (e.g., IEP or IFSP with speech services) were included in the study. Parents attended the 12 week Incredible Years-ASLD® telehealth intervention. Parent-child interactions were recorded for 12 minutes while they played together in structured play (5min), free play (5min), and clean up (2min) at baseline. Play interactions were coded in 15-second intervals to assess parents' use of strategies taught in the program and the dyad's level of joint engagement in the same interval (see Tables). Analyses explored the total number of strategies used by the parent within each interval as well parents' use of individual strategies at the interval level.

Results:

There was no significant correlation between the dyad's overall level of joint engagement and the *total number* of different IY strategies the parent used in a 15-second interval, $r(765) = .053, p = .143$. However, when individual strategies were examined, a significant negative correlation emerged between JE level and parents' use of active ignoring $r(765) = -.158, p < .001$ and redirection of attention $r(765) = -.144, p < .001$. Additionally, there was a significant positive correlation between JE level and use of descriptive comments $r(765) = 0.078, p = .031$.

Conclusions:

The results suggest that the effectiveness of strategies in supporting a state of JE may not be dependent on the total number, but rather on the quality of specific strategy implementation. Active ignoring and redirection of attention were both negatively associated with JE. This may be because these strategies tend to coincide with children's negative behaviors. In contrast, descriptive comments is a strategy that entails following of the child's lead, suggesting that descriptive commenting usage could help promote a JE state. Through understanding the relationships between JE and IY-ASLD strategies, clinicians may better prepare parents for the application of curriculum to real-life interactions with their children.

**414.243 Building Bridges! Children with Autism Spectrum Disorder and Their Transition from Kindergarten to School**

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Background:

It is well documented that transitioning to school supposes an immense and stressful change for children with Autism Spectrum Disorder. Adapting to a new setting, with new rules, new challenges and demands can be both physically and mentally exhausting for the child, his/her family and the school staff.

Objectives:

The goal of this study was to map the research on the transition from kindergarten to school for children with autism spectrum disorder (ASD). Further, the goal was to identify the elements influencing the transition process as well as the variables that would promote a smooth and positive transition experience for the children in question. The study also aimed to identify knowledge gaps on the subject and the current practice in the field.

Methods:

The study is a scoping review that includes peer reviewed articles from the databases ERIC, Google scholar, PsycINFO and Web of Science and the search was restricted to articles in English from 2019-2024. The search terms used were autism spectrum disorder, autism, transition, preschool, ECEC, inclusion, education intervention, early childhood, early education and kindergarten. After identifying and screening current articles from the databases, the articles were ascertained for relevance in three stages. In phase one, the title was considered. Phase two consisted of reviewing the abstract, and the final stage was to review the full text. At each stage, articles that did not prove relevant to the goal of the study were excluded. This left us with thirteen articles for inclusion in this article.

Results:

In the selected articles the following elements are necessary for children with autism to have a positive transition from kindergarten to school: 1) School readiness skills and school inclusiveness, 2) Comparable educational opportunities and psychological support, 3) Collaboration and professional competence, 4) A balance to ensure a better transition, and 5) Inclusion and support and 6) Children's perspectives.

Conclusions:

The research gaps identified were: 1) that few studies take the child's perspective into account, and 2) that there is an overemphasis on subjective experiences of effectiveness, and a lack of focus on measurable effects within studies on transition and inclusive education.

414.244 Caregivers Skills Training in Brazil: A Follow-up Analysis

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Background:

Caregivers Skills Training (CST) is a World Health Organization program developed to assist caregivers of children with developmental delays and teach them to stimulate the development of children's skills. The program is implemented in more than thirty countries and evidence points to an improvement in both training objectives. In Brazil, the CST was adapted and validated, and is being disseminated in the public health context. However, despite the positive results of the program at the end of the training, we need more data from the impacts of the CST after training.

Objectives:

This research aimed to evaluate and compare the perception of the impacts of the CST 6, 12 and 18 months after completing the training.

Methods:

Thirteen caregivers participated from three different CST family groups (two online and one in-person training courses). The groups had different periods elapsed since they completed the training (6, 12 or 18 months) from when data was collected. A focus group with each group was conducted, these were recorded, transcribed, and analyzed using Content Analysis.

Results:

The results from the Content Analysis indicate that caregivers from all groups cited as positive impacts of the program: the development of the child's new skills; a greater empowerment by the caregiver; a better management of problem behaviors; a more organized of the environment and routine; healthier family relationships; and establishment of a positive support network. Some caregivers commented that they got back to the print guides to review the materials and suggested friends, or other family members, read them to deal with some problem.

The differences found between the groups can be associated with the modality of training (online or in-person). The group with in-person training cited a more established relationship than the online ones, this relationship extrapolated the CST sessions to frequent conversations and mutual support. As for the online groups, a reminder of the caregivers and child's names before the focus groups was needed at the beginning of the session. In the focus group session with the in-person trained group there were more parallel conversations and discussions about non-related topics.

The caregivers also made suggestions for the CST such as including at least one moment to talking about toilet training and food selectivity; holding meetings after the end of the CST to review the topics and strengthen their support network; and that some materials for easy access with key messages and tips would be useful as a reminder strategy.

Conclusions:

These findings suggest that the main goals of the CST were maintained even months after the end of the training, that the strategies taught during the training were useful for the families on many occasions and that the families benefited from the online training, even though there were some drawbacks that can be related to this training modality. The sample size from this study is small, so other research with similar objectives and different methodologies are essential for further comprehension of the CST impacts.

414.245 Characterizing Federally Mandated Early Intervention for Children with Social Communication Delays: A Mixed Methods Analysis

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Background: The most common way for toddlers with social communication delays to receive intervention is through Part C early intervention (EI). However, little research has characterized the structure, content, or quality of interventions. Available studies focus on caregiver coaching and reveal discrepancies between provider-reported and observed levels of caregiver coaching during EI (Arranbarri et al., 2021; Lee et al., 2022; Pellecchia et al., 2023).

Objectives: Utilizing a mixed methods approach, our team characterized provider practices during EI sessions with children with social communication delays across four United States. Specifically, we (1) described caregiver coaching based on (a) provider report and (b) observations of EI sessions, and (2) characterized the structure and content of EI sessions.

Methods: Participants were drawn from an ongoing multi-site clinical trial examining the effectiveness of Reciprocal Imitation Training (RIT). EI providers randomized to the treatment-as-usual condition, who enrolled at least one family into the larger study by January 2024 ($n = 33$; 32 females; 26-61 years old) were included. Providers completed the Provider Services Questionnaire (PSQ) at baseline, which asked about their frequency of caregiver coaching practices during typical EI sessions, and recorded three EI sessions with each family enrolled in the larger study. One session per provider was randomly selected for coding by raters masked to group. Sessions were coded for quality and quantity of evidence-based caregiver coaching strategies using the Parent Empowerment and Coaching in Early Intervention (PEACE) caregiver coaching fidelity tool (Pellecchia et al., 2023). The PSQ and PEACE use a 5-point Likert scale (0 = Never, 5 = Always). Additionally, an adapted Rapid Qualitative Coding approach (Hamilton & Finley, 2018; Nevedal et al., 2021; Vindrola-Padros & Johnson 2020) was used to summarize the content of sessions and other intervention strategies (beyond parent coaching) that were used during session.

Results: Providers self-reported greater use of caregiver coaching, relative to video coding by researchers (see Table 1). Rapid coding revealed that providers consistently use developmental strategies (e.g., child-led play, labeling, modeling) and behavioral strategies (e.g., prompting, reinforcement). Notably, although certain behavioral strategies were frequently used, the coding team rarely observed effective use of sequenced behavioral teaching approaches. For example, providers often cued children to say or do something, but did not provide support or follow-through (e.g., repeated prompts, scaffolding) if the child did not respond. Similarly, providers maintained a positive attitude and frequently praised children, but praise was general rather than specific, and positive reinforcement was not consistently contingent upon children's actions. Additionally, there was substantial variation in observed session duration, structure, and caregiver and child engagement.

Conclusions: This study replicates previous findings that EI providers report greater use of caregiver coaching than is observed, and provides information about other types of interventions delivered to children with social communication delays in Part C. It highlights that providers are already utilizing many evidence-based strategies to support children's development. However, opportunities remain to further enhance and standardize practices to ensure the provision of the most efficacious interventions during a time of heightened brain plasticity.



414.246 Determinants of Improved Outcomes One Year Post-Initiation of Applied Behavioral Analysis in a Sample of Turkish Autistic Children

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Background: Applied behavior analysis (ABA) is a leading evidence-based intervention for autism spectrum disorder (ASD), yet it is often out of reach for families in low- and middle-income countries (LMICs). Recent research has explored the relationship between the age at which early interventions are initiated and their impact on outcomes for children with ASD. These studies emphasize the importance of examining multiple predictor variables to fully understand treatment outcomes.

Objectives: The study aims to build on this by examining pre-treatment factors influencing ABA treatment outcomes.

Methods: The records of 223 individuals receiving ABA therapy at a special education center in Istanbul, Türkiye were reviewed. From this population, 64 children diagnosed with ASD who had completed at least 12 months of ABA therapy were initially selected for the study. After excluding children without pre-therapy assessment data, the final sample comprised 50 children (45 males, 5 females) with a mean age of 6.1 years ($SD = 2.0$). Sociodemographic and clinical history, including information on medication use and psychological test results, were obtained for all participants. The Gilliam Autism Rating Scale-2 (GARS-2) was administered to assess the initial symptom severity of the participants. Additionally, the Psychoeducational Profile-Revised (PEP-R) was employed to evaluate developmental functioning at baseline (T0) and after one year (T1) of ABA therapy.

Results: The sociodemographic characteristics and scale results are presented on Table-1. The weekly session number was 5.18 ± 3.39 , the use of any regular medication was 44% ($n=22$) and psychotropic medication was 22% ($n=11$). Among the variables age of the participant ($r=-0.308, p=0.026$), GARS-2 autism index score ($r=-0.309, p=0.037$) and GARS-2 stereotyped behaviors score ($r=-0.373, p=0.019$) had negative low correlation with the difference in total PEP-R scores. GARS-2 autism index score was negatively correlated with difference in PEP-R imitation ($r=-0.343, p=0.024$), perception ($r=-0.414, p=0.005$), cognitive performance ($r=-0.365, p=0.015$) and cognitive verbal scores ($r=-0.357, p=0.045$). GARS-2 stereotyped behaviors score was negatively correlated with difference in PEP-R imitation ($r=-0.347, p=0.038$), perception ($r=-0.374, p=0.023$), cognitive performance ($r=-0.524, p<0.001$) and cognitive verbal scores ($r=-0.391, p=0.048$). In multiple regression analyses, younger age of the participant, lower GARS-2 autism index score and lower GARS-2 stereotyped behaviors score at the initiation of the treatment predicted better outcomes following a year of ABA treatment in autistic children ($f(3,35)=4.342, p=0.011, R^2=0.271$).

Conclusions: The findings highlight that the effectiveness of ABA therapy for autistic children is influenced by several factors, including the age of the child and the severity of symptoms as measured by the GARS-2 autism index and stereotyped behaviors. Our findings indicate that younger children with lower autism severity at the start of treatment show better developmental improvements over a year of therapy even in low intensity settings. It is important to note that the average weekly session frequency in our sample was significantly below the optimal level of 20 sessions per week, which is recommended for maximizing ABA's efficacy. This underscores a critical gap in service provision, especially in LMICs, where access to the recommended level of therapy may be limited. Future research should aim to explore the impact of achieving optimal session frequency on treatment outcomes and address the barriers to accessing adequate levels of ABA therapy in these settings.



414.247 Development and Usability Testing of a W.H.O. Caregiver Skills Training Smartphone Application (Kica)

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Background: Mobile-health approaches to parent-mediated interventions (PMIs) hold great potential for implementation scale-up. However, essential phases of an application development cycle, such as stakeholders consultations for needs assessment and usability testing, are often overlooked. Findings of a previous consultation with professionals and caregivers about a to-be-developed mobile application based on the WHO Caregiver Skills Training (CST) indicated that it should be suitable for parental self-directed use regardless of previous exposure to PMIs and employ easy-to-use, engaging and customizable activities to: 1) provide psychoeducation; 2) support home practice and 3) promote psychological well-being.

Objectives: To report on the development process of Kica, a novel mobile application based on CST (Phase 1), and to explore caregivers' views on the prototype's design, content, and usability (Phase 2).

Methods:

[Phase 1] The app was designed with a user-centered approach, tailored to stakeholders' needs. It adapts CST contents and learning activities into 6 lessons covering engagement, communication, and routines. Each lesson includes a Learning Mode for psychoeducation, a Practice Mode with guidance on interaction strategies with children, and Wellbeing Mode for self-care (Figure 1, part A). Gamification elements were added to enhance engagement and motivation, including quizzes, self-assessment graphs for tracking strategy use, micro-learning videos, and skills demo-clips.

[Phase 2] Participants in the usability tests were 19 parents (with at least intermediate proficiency in Italian; 84% mothers) of 2–6-year-old autistic children ($M=53$ months, $SD=14$), recruited from public health services in Northern Italy. On their first interaction with the prototype, participants either received the Cognitive Walkthrough (CW; Polson et al., 1992; $n=11$), which assesses success rates (success; partial success; failure) on 18 app navigation tasks and self-reported difficulty (7-point scale), or the Think-Aloud task (TA; Charters, 2003; $n=8$), providing feedback in design, content, and usability. The two groups were balanced on background characteristics (gender, nationality, education, income, all $ps > .05$). All participants were then asked to rate the overall usability on the 10-item, 5-point-scale System Usability Scale (SUS; Brooke, 1996).

Results: The average task success rates in the CW was 85% ($SD=19$), with significant differences by Italian proficiency in the 3 tasks with suboptimal ($<60\%$) success rates (all $ps < .05$; Table 1). Task difficulty ratings were in the 'low' range ($M=2.44$, $SD=1.84$). Thematic analysis (Brown & Clarke, 2012) of TA transcripts supported these findings: participants appreciated the videos and visual aids, the scheduling features for daily activities, and the focus on routines to promote relationship with the child and communication. Suggestions for improvement included enhancing progress tracking and feedback, and personalized features based on child's needs. Usability issues mainly concerned poor graphic contrast and navigation difficulties. Total SUS ratings ($M=81.44$, $SD=14.89$) indicated overall acceptable usability.

Conclusions: Usability testing highlighted strengths and areas for improvement. Adjustments to the prototype included simplifying and minimizing language, redesigning the home screen, enhancing visual cues for progress and activity tracking, and clarifying previously hidden or misleading functionalities (Figure 1, part B). Overall, the findings indicate good acceptability and support formal testing of feasibility and preliminary clinical efficacy through pilot testing.

**414.248** Development of Telehealth Parent-Mediated Intervention for Young Children with ASD in Taiwan: A RCT Study

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Background: Due to the COVID-19 public health crisis, in-person interventions became largely infeasible from 2020 to 2022 in Taiwan. As a result, it is crucial to develop an evidence-based, telehealth, parent-mediated intervention for young children with autism spectrum disorder (ASD) that includes cultural adaptation.

Objectives: This study aimed to examine the intervention effects on children's outcomes between self-directed and coach-assisted groups.

Methods: A randomized controlled trial (RCT) was conducted with 36 parents and their children with ASD (aged 20 to 47 months), recruited between 2020 and 2023, and randomized into coach-assisted and self-directed groups. The intervention lasted 13 weeks, with online courses adapted primarily from the Early Start Denver Model (ESDM) parent manual. Parents in both groups were asked to complete weekly online courses, while parents in the coach-assisted group also received an additional 1-hour coaching session via videoconference. Assessments were conducted at baseline, immediately post-intervention, and three months post-intervention. Outcome measures included parental knowledge of intervention strategies, ESDM fidelity, and children's spontaneous functional communication and joint engagement.

Results: The results indicated the following: (1) Both groups of parents improved their knowledge of intervention strategies post-intervention. However, only parents in the coach-assisted group showed significant improvement in ESDM fidelity, with the benefits sustained three months post-intervention. (2) Regarding child outcomes, only children in the coach-assisted group demonstrated a significant increase in the variety of communication functions, and this effect was maintained three months post-intervention. Additionally, both groups of children exhibited a significant increase in the proportion of high-level joint engagement during the intervention period, although this effect was not sustained three months post-intervention.

Conclusions: The results revealed that the online coaching program for parents can enhance the quality of parent-child interaction and improve children's communication abilities at home. Moreover, both the self-directed and coach-assisted groups showed potential for improving the social communication skills of children with ASD.

414.249 Differential Response to Early Intervention between Autism Subtypes Defined Based on Non-Core Language, Intellectual, Motor, and Adaptive Functioning Features.

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Background:

While difficulties in social-communication and restricted repetitive behaviors hallmark core features of autism, they do not capture other important features that distinguish young autistic children. Non-core features such as language, intellectual, motor, and adaptive functioning (LIMA) separate autism into a type I versus type II distinction. These subtypes separate autism into types with relatively high (type II) compared to low (type I) levels of LIMA scores. The subtypes are also meaningful for predicting differential early developmental trajectories and functional and structural neuroimaging phenotypes (Mandelli, Severino et al., 2024). However, it is unclear whether they also point to a distinction that is relevant for understanding who benefits most from early intervention.

Objectives:

In this work we aim to test whether type I versus type II autism subtypes will differentially respond to early intervention. Specifically, we examine whether the Early Start Denver Model (ESDM) or community-based treatment-as-usual (TAU/COM) intervention programs show differential responses as a function of subtype.

Methods:

We pool data from 7 studies on early intervention in autistic children, collected over 8 sites internationally (USA, Switzerland, Israel, Australia) and comprising $n=361$ (female $n=77$) participants (age = 11-60 months). Participants received from 6 to 27 months of intervention, with variable levels of intensity, and were enrolled in either ESDM ($n=170$) or TAU/COM ($n=191$) interventions. Longitudinal data common to most datasets included Mullen Early Scales of Learning (MSEL), Vineland Adaptive Behavior Scales (VABS), and ADOS. Subtypes were predicted using pre-treatment MSEL and VABS data in a subtype prediction model validated in prior work (Mandelli, Severino et al., 2024). Linear mixed effect models were used to predict trajectories of MSEL age-equivalent scores, VABS domain standardized scores, or ADOS calibrated severity scores, with random effects of dataset and age grouped by subject, fixed effects of treatment type, subtype, age, and their interactions, and other covariates such as treatment intensity, sex, age at treatment start, and pre-treatment developmental quotient. Control for multiple comparisons was achieved using FDR $q<0.05$. Follow-up analyses tested for the effect of treatment type within each subtype separately using the same mixed effect modeling framework.

Results:

After controlling for several covariates (e.g., sex, treatment intensity, age at treatment start, pre-treatment developmental quotient), we observed age-related interactions with subtype on all MSEL subscales and on VABS communication and motor domains, as well as with treatment type on MSEL receptive and expressive language and VABS communication scales. Explaining the age*subtype interactions, we find that type II individuals generally have faster growth trajectories compared to type I. To explain the age*treatment type interaction, we find that expressive and receptive language growth is facilitated more by ESDM than COM/TAU specifically in the type I subtype ($p = 0.02$), but not in type II ($p = 0.47$).

Conclusions:

This work suggests that in addition to being developmentally sensitive, LIMA-defined early autism subtypes may be treatment-relevant. Both ESDM and COM/TAU tend to work similarly on both subtypes. However, there is a subtle facilitative effect for ESDM on expressive and receptive language in type I individuals.

414.250 Does Baseline Expressive Language Ability Predict Early Intervention Outcomes? Evidence from the Social ABCs

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Background:

The Social ABCs is a caregiver-mediated early intervention for toddlers showing social-communication challenges that may be signs of autism spectrum disorder (ASD). With a large research evidence base and widely offered community-based services, children with varying language skills are accessing the program. In clinical application of this work, whether children with lower baseline language abilities benefit from caregiver-mediated early interventions that focus on vocal communication targets remains a question.

Objectives:

To support clinicians who refer children to caregiver-mediated early interventions, this study aims to determine whether children with lower expressive language skills benefit from programs such as the Social ABCs.

Methods:

67 families (62 mothers, 4 fathers and 1 grandmother) participated in a randomized control trial of the Social ABCs. Before starting the program all toddlers (52 boys, 15 girls; mean age: 25.95 months; range: 18-32 months) were assessed using the Mullen Scales of Early Learning. Expressive Language scale age- equivalent (AE) scores were categorized into three AE bands: 0-11 months, 12-17 months, and 18-36 months. Video-coded data were used to calculate child responsivity, child initiations, orienting to caregiver, shared smiling, and caregiver implementation fidelity before and after intervention, and change scores for these target skills were examined.

Results:

An ANOVA of change scores showed gains across all toddler variables for all age bands with no significant differences. Caregiver implementation fidelity showed a significant effect between groups ($F(2,47) = 5.11, p = .010$). All groups gained in implementation fidelity; post hoc analysis showed a significant difference ($p = .008$) in caregiver fidelity for toddlers in the 12–17-month AE band ($M = 44.03$) compared to the 18+ AE band ($M = 28.34$). These findings suggest that the Social ABCs is beneficial regardless of baseline expressive language abilities.

Conclusions:

These findings contribute to a larger understanding of which toddlers and families benefit most from participating in early intervention programs. Toddlers with very low expressive language skills at baseline can still benefit from early caregiver-mediated interventions such as the Social ABCs. Regardless of baseline expressive skills, all children in this study had an equal opportunity to make gains in the areas of responsivity, child initiations, orienting to caregiver and shared smiling. Caregiver implementation fidelity increased for all groups, with a notably larger increase for the 12–17-month AE group. One possibility is that caregivers of toddlers who have relatively lower language abilities at baseline may be uniquely motivated to learn the intervention strategies. We will explore this in further analyses. This information may be helpful in informing clinical triage decisions.

414.251 Early Child-Clinician Patterns of Acoustic Synchrony Predict Outcome of Autism Intervention

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Background: Patient-therapist dynamics is a core component of psychotherapy. However, the way it contributes to outcomes remains largely unknown. Fine-grained research on mechanisms of action in psychotherapy is time-consuming and labor-intensive because of human data annotation, and it suffers from poor quantification. This is also the case for developmental approaches in the context of neurodevelopmental conditions like autism, where research is stressing the role of the interpersonal interplay as an active element, e.g., of Naturalistic Developmental Behavioral models of Intervention (NDBIs). **Objectives:** In this study, we evaluated whether changes in the child-clinician acoustic synchrony dynamics during the first few months of autism NDBI predicted the outcome at one year with a computational approach. **Methods:** We followed 25 autistic preschool children and 17 therapists during recommended developmental intervention over one year and video-recorded two 60-min sessions for each child: one at baseline and one at three months, for a total of 50 videos. We developed a fully automated pipeline based on deep learning and affective computing to automatically segment and annotate children's and therapists' voices and to quantitatively model child-clinician acoustic synchrony in order to predict intervention outcome (developmental learning rates) at one year through logistic regression. We modeled synchrony at different levels of sophistication, including a complex dynamical system perspective by means of Recurrence Quantification Analysis. We employed a rigorous pipeline to perform feature selection, model development and model evaluation through nested leave-one-out cross-validation and machine learning algorithms. We further included a data augmentation analysis to test result generalization. **Results:** We found that early changes in child-clinician acoustic synchrony accurately predicted the clinical response (Bal accuracy=0.96; F1=0.96, sensitivity=1; specificity=0.92; precision=0.92; MCC=0.92; AUCROC=0.99; PRROC=0.99). Specifically, a better response trajectory was predicted by (i) patterns of synchrony concurrently displaying increased variability, predictability, and organization of their internal structure; and (ii) acoustic features mainly related to emotional engagement. Interestingly, non-responders showed complementary patterns with respect to the evolution of these variables. **Conclusions:** We conclude that our non-invasive system is accurate and applicable to large amounts of naturalistic data. It can also be flexibly adapted to different developmental clinical settings. For autistic children, it supports the role of interpersonal synchrony and emotional engagement as key elements to promote intervention efficacy, as well as the pivotal role of the early months for intervention efficacy. Implications include the possibility to develop a "therapeutic feedback", implement systematic treatment monitor, and the disclosure of interaction features that may allow for efficacy maximization and treatment individualization .



414.252 Effectiveness of a Caregiver-Involved Group-Based Ndbi Program for Autistic Preschoolers: Preliminary Analysis of a Pilot Randomized Controlled Trial

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Background:

Naturalistic Developmental Behavioral Interventions (NDBIs) are highly effective in enhancing cognitive and social communication skills in autistic children. Caregiver involvement in these interventions further amplifies their effectiveness. Additionally, some specific NDBI models delivered in group-based contexts suggest that such settings can foster autistic children's development and may be more practical for community-based implementation, facilitating the translation of early intervention research into real-world practice. However, most existing evidence is derived from one-on-one NDBI programs, which require certified therapists and maintain a high staff-to-child ratio. Therefore, developing and evaluating the effectiveness of group-based programs that adhere to open-access NDBI fidelity guidelines, involve caregivers, and operate with a lower staff-to-child ratio is necessary to provide a more feasible model for clinical practice.

Objectives:

This study aims to evaluate the effectiveness of a caregiver-involved group-based NDBI program for autistic preschoolers in improving (1) development, (2) social communication, and (3) adaptive functioning.

Methods:

We recruited autistic children aged 2-4 years and randomly assigned them to either (1) a group-based NDBI program (experimental group) where one therapist led five caregiver-child dyads or (2) a one-on-one NDBI program (active control group). Both interventions were delivered twice a week, with each session lasting 1 hour, for 12 weeks. Intervention fidelity was maintained using the NDBI-Fi for the one-on-one program and an adapted group-based NDBI-Fi for the group program. All children were assessed using the Autism Diagnostic Observation Schedule (ADOS) and clinically diagnosed by a child psychiatrist. Outcome measures included assessor-blinded Individual Growth and Development Indicators (Early Communication Indicators and Early Social Indicators), the Mullen Scales of Early Learning (MSEL), and the caregiver-reported Vineland Adaptive Behavior Scales, Third Edition (VABS-3). Repeated measures ANOVA was used to compare time effects and time-by-group interactions.

Results:

Five children (four boys and one girl), aged 27 to 46 months (mean = 38.8 months, SD = 7.4), were assigned to the group-based NDBI program, while five children (three boys and two girls), aged 29 to 44 months (mean = 38.8 months, SD = 5.9), were assigned to the one-on-one NDBI program. There were no significant differences between the groups at baseline regarding age, sex, ADOS Calibrated Severity Score, or developmental quotient (DQ). In the MSEL, a significant time effect was found for verbal DQ ($F = 12.55, p = 0.008$) and overall DQ ($F = 19.24, p = 0.002$), with a significant time-by-group interaction for overall DQ ($F = 6.25, p = 0.037$). A significant time effect was observed for Early Social Indicators ($F = 8.80, p = 0.018$), though no time-by-group interaction was found. No significant time or time-by-group effects were found for Early Communication Indicators or the VABS-3.

Conclusions:

Preliminary findings suggest that the caregiver-involved group-based NDBI program yields benefits similar to those of individual interventions in verbal development and early social functioning for autistic preschoolers. The integration of caregivers, adherence to open-access NDBI fidelity, and a lower staff-to-child ratio suggest that this program is feasible for clinical implementation while maintaining its therapeutic effectiveness.



414.253 Effectiveness of a Early Intervention Model for Children with Autism and Family Outcomes: A Repeated Measurement Study

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Background: Early intervention has been shown to improve outcomes for children with autism, particularly in areas such as language development, social skills, and adaptive behavior (Dawson et al., 2010; Reichow et al., 2012). However, evaluating the long-term effectiveness of these interventions presents unique challenges. A repeated measurement study design, which includes multiple time points, is essential for capturing the dynamic nature of intervention effects on both children with ASD and their families.

Objectives: The purpose of this study was to evaluate the effects of an early intervention model based on the principles of Naturalistic Developmental Behavioral Intervention (NDBI) on young children with autism spectrum disorder (ASD) and family outcomes in China.

Methods: We used quasi-experimental design for two groups and conduct repeated measurement at baseline, post, and 8-week follow up. The sample ($N = 60$) mean age was 4.8 years old ($SD = 1.1$) in this study. Children in the treatment group received the culturally adapted intervention 3 hours per day, 15 hour per week. Children in the control group received public-funded intervention services for 3 hours per day, 15 hours per week for a total of 8 weeks. To assess changes over time and differences between groups at the follow-up stages, we used mixed effect models to fixed effects.

Results: Findings demonstrated a significant decrease in autism symptoms and improved severity categorization for children in the intervention group, compared with the control group in both post and the follow up phrase. The treatment group showed a greater improvement ($b [SE] = 0.31[0.05], t = 36.3, p < .001, d = 0.65$) based on the overall ATEC score and CARS score ($b [SE] = 0.83[0.05], t = 2.87, p = .011, d = 0.37$). Also, there were positive changes for the treatment group's parental stress and anxiety levels. In the pre-post comparison, there was a significant improvement in the treatment group ($b [SE] = 0.16[0.05], t = 9.5, p = .002, d = 0.73$) for the SAS overall score. The largest effect was seen in the PSI overall score, where the treatment group showed a significant coefficient of 1.62 ($SE = 0.12, t = 17.3, p = .001, d = 0.49$). In the follow up comparison, there was a significant improvement in the treatment group ($b [SE] = 0.21[0.04], t = 12.3, p < .001, d = 0.78$) for the SAS overall score. The largest effect was seen in the PSI overall score, where the treatment group showed a significant coefficient of 1.95 ($SE = 0.21, t = 13.4, p < .001, d = 0.51$).

Conclusions: This study contributes to the growing body of evidence that early intervention is critical for improving outcomes in young children with autism. The improvements observed in communication, sociability, and sensory awareness, along with the sustained long-term benefits and positive impacts on parental stress, underscore the importance of early, targeted interventions. It also highlights the broader family benefits, emphasizing the need for a holistic approach to autism care that supports both the child and the parents.

414.254 Engaging Stakeholders to Adapt Ndbi Parent Coaching Interventions for Use in Early Childhood Education Settings

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Background: Naturalistic Developmental Behavioral Interventions (NDBIs) provide a promising framework for early autism intervention research. Researchers have begun to specify and measure essential elements of evidence-based NDBI parent coaching interventions, both at the clinician-parent (Edmunds et al., 2022) and at the parent-child level (Frost et al., 2020). Many of these strategies align broadly with Developmentally Appropriate Practice guidelines published by the National Association of the Education of Young Children (NAEYC), which emphasize the importance of fostering reciprocal partnerships with families in preschool settings (Siller et al., 2023).

Objectives: To gather input from multi-setting and multi-level stakeholders to adapt NDBI parent coaching interventions for use in authentic ECE settings.

Methods: Participants were $N=34$ stakeholders, including ECE system leaders ($n=6$), program directors or principals ($n=6$), teachers ($n=11$), and parents ($n=11$). Ninety one percent (91%) of participants were female and ranged in age from 21 to 65 years ($M=42.5$, $SD=11.4$). Ethnic and racial diversity included 85% White, 15% Hispanic or Latino, 9% Asian, and 6% Black or African American. Stakeholders represented multiple ECE systems, including public school-based ECE (43%), Head Start (22%), and private ECE centers (48%). Following an initial survey, $n=31$ participants (91%) completed structured interviews, probing for experiences, opportunities, and barriers related to engaging parents of children with social-communication challenges in ECE settings. Interviews were transcribed and coded by two doctoral students using qualitative content analysis.

Results: Qualitative analyses revealed four content domains: (1) target population, (2) parent education format, (3) parent education content, and (4) feasibility and barriers. Interviews reveal that ECE settings educate children with a broad range of social-communication challenges, including children with high likelihood of autism. In terms of parent education format, stakeholders emphasized the potential of in-person opportunities for learning, practice, and coaching (e.g., literacy night), compared to didactic workshops (online or in-person). When questioned about learning content, stakeholders prioritized a broad range of strategies for promoting engagement (e.g., focus on the child, responding to and expanding children's communication), over more structured teaching strategies (e.g., prompting hierarchies, reinforcement analysis). Finally, the main barrier reported by preschool staff and parents was time, emphasizing that parent engagement opportunities in ECE should be limited in frequency and duration.

Conclusions: Stakeholder input was used to adapt NDBI parent coaching strategies for use in authentic ECE settings to develop Family-School Partnership Intervention (FSPI). Key components of FSPI include (1) opportunities for practice and coaching are embedded in a playgroup format where teachers guide parents through a small number of familiar routines shared at home and at school (e.g. book reading, chore, play, and snack); (2) program intensity is limited to three 90-minute playgroups scheduled over the course of a school year; (3) the intervention content focuses on six engagement strategies to promote children's investment, independence, and initiations; and (4) the program is implemented by preschool staff and targets children with a variety of social-communication challenges. A feasibility trial of FSPI is currently underway.

414.255 Estimating Individualized Intervention Effects of a Parent-Implemented Social Communication Intervention in Autistic Preschoolers: A Randomized Controlled Trial

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Background:

Autistic individuals show significant variability in social communication skills, and parent-implemented interventions have demonstrated positive developmental impacts. However, such interventions often lead to heterogeneous effects across individuals. While randomized controlled trials (RCTs) traditionally focus on group-level outcomes, individual variability in response to interventions may be obscured, especially when group-level effects are driven by a subset of highly responsive individuals. Understanding individualized effects is essential for tailoring interventions to those most likely to benefit.

Objectives:

This study aimed to estimate the individualized intervention effects of a parent-implemented social communication intervention in autistic preschoolers. We sought to identify child- and parent-related characteristics that predict better outcomes, moving beyond average treatment effects (ATE).

Methods:

A total of 112 minimally verbal autistic children aged 2-5 years from Mainland China participated. Children with listening or visual impairments or neurological/psychiatric conditions were excluded. One of their parents participated in a randomized controlled trial, with families randomly allocated to either the SLT (speech-language therapist) -Led or the Self-Study Group using a minimization method (see Table 1). In the SLT-Led Group, parents participated in 20 weeks of online lessons led by an SLT, during which they learned seven key communication strategies and received feedback on weekly video submissions of interactions with their children. In the Self-Study Group, parents received bi-weekly reading materials on the same communication strategies over 20 weeks but did not submit videos or receive therapist feedback. Outcomes were measured using ADOS-2 and Vineland-3 Communication scores in 12 months.

Results:***Predicted Individual Intervention Effects***

Machine learning models (T-Learner and X-Learner) were used to estimate individualized intervention effects. While no significant group-level effects were found, individualized effects revealed higher intervention benefits for the SLT-Led group compared to the Self-Study group (**ADOS CSS**: ATE = -0.10, 95% CI [-2.03-1.83] in T-Learner, ATE = -0.11, 95% CI [-1.69-1.47] in X-Learner; **Communication Score**: ATE = 1.36, 95% CI [-17.45-20.17] in T-Learner, ATE = 1.63, 95% CI [-12.70-15.95] in X-Learner).

Child- and Parent-Related Characteristics Associated with Individualized Effects

Among child- and parent-related characteristics in Table 1, parental BAPQ scores, child age, PSS, Child SCQ and parental sex were the most important characteristics influencing the individualized intervention effects on the ADOS CSS. For the communication, parental BAPQ scores, PSS, child age, household income levels, and POSC were most important characteristics. Notably, these relationships were not linear as suggested by previous studies. For example, as shown in Figure 1, the association between parental BAPQ and ADOS CSS was a U shape, suggesting scores ranged between 3-3.5 took more benefit from the SLT-Led course.

Conclusions:

Our findings highlight the importance of individualized analyses in intervention research. While average effects may be negligible, individual responses vary significantly, with specific child- and parent-related characteristics predicting better outcomes. These insights can help inform personalized intervention strategies, ultimately enhancing intervention scalability and effectiveness for a wider range of autistic children.



414.256 Evaluating the Effectiveness of Telehealth-Delivered Parent-Implemented Esdm on Developmental Outcomes and Maternal Anxiety in Young Autistic Children.

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Background:

Early intervention for autistic children increasingly emphasizes the importance of embedding learning opportunities within everyday routines and naturalistic environments. By actively involving parents in the intervention process, parent-mediated approaches create unique opportunities to integrate skills and strategies into daily life. Research has demonstrated that these interventions positively impact children's communication, social interaction, and behavior (Cheng et al., 2023), while also empowering parents by boosting their sense of efficacy and helping them manage stress and anxiety (Pacia et al., 2022). Moreover, the use of telehealth modalities for delivering parent coaching enhances accessibility and flexibility, reducing barriers such as travel and scheduling, and providing real-time support and feedback directly within the family's natural environment (Pan et al., 2023).

Objectives:

Building on this evidence, our study aims to compare the effects of a parent-implemented Early Start Denver Model (PESDM) and Therapy As Usual (TAU) on child developmental outcomes and maternal anxiety, exploring how different intervention modalities delivered with similar low intensity influence both child and caregiver well-being.

Methods:

Participants were young children diagnosed with autism according to DSM-5 criteria. The PESDM group included 52 children (39 males), aged 16–37 months (mean=26.48; SD=4.7), while the TAU group comprised 27 children (26 males), aged 19–39 months (mean=30.92; SD=5.3). TAU children received three 1-hour one-on-one therapy sessions per week through public services. The PESDM group received a mixed-modality intervention: two 1.5-hour one-on-one ESDM sessions at CNR-IRIB facilities and one remote parent coaching session using video feedback. Child development was assessed with the Griffiths Mental Development Scales (GMDS), and maternal anxiety with the State-Trait Anxiety Inventory (STAI). A linear mixed-effects model analyzed developmental trajectories, controlling for age and developmental quotient at intervention start.

Results:

The findings revealed a significant effect of intervention modality on the overall score and all developmental domains assessed by the GMDS (General: $F(1,152)=10.83$, $p=0.001$; Locomotor: $F(1,152)=12.67$, $p<0.001$; Personal-Social: $F(1,152)=10.75$, $p=0.001$; Hearing-Language: $F(1,152)=4.25$, $p=0.04$; Eye-Hand Coordination: $F(1,152)=5.58$, $p=0.01$; Performance: $F(1,152)=5.06$, $p=0.02$), with children in the PESDM group showing greater developmental gains compared to the TAU group (Fig. 1). Additionally, mothers in the PESDM group demonstrated a reduction in anxiety levels after the 6-month intervention period, approaching significance (STAI: $F(1,112)=4$, $p=0.048$) (Fig. 2).

Conclusions:

This study underscores the efficacy of a parent-implemented ESDM intervention delivered via tele-health using a video-feedback approach, demonstrating significant enhancements in early developmental outcomes for children and reductions in maternal anxiety. These findings suggest that mixed-modality, parent-focused interventions can effectively improve developmental trajectories in young children with autism while supporting parental well-being, ensuring that autistic children receive support that is aligned with their natural experiences and environments.



414.257 Examining Parent Fidelity in Reciprocal Imitation Teaching: Challenges and Gaps in Implementation

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Background: Parent fidelity in implementing Naturalistic Developmental Behavioral Interventions (NDBIs) is essential because it ensures that intervention strategies are delivered as designed, which directly impacts child progress (Roberts et al., 2019). Consistent and accurate use of these techniques by parents has been linked to better outcomes in areas such as social communication, imitation, and language development (Ouyang et al., 2024). Without high fidelity, the effectiveness of NDBIs may be compromised, limiting potential benefits for children.

Objectives: The objective of this study is to examine parent fidelity of a specific NDBI, Reciprocal Imitation Teaching (RIT), following caregiver coaching from a Part C Early Intervention provider. Specifically, this study aims to understand which components of RIT are not being completed in a subsample of caregivers who had low fidelity.

Methods: This project stems from a larger RCT examining a brief, inexpensive training in RIT, compared to an active control condition, on EI providers' implementation of RIT and downstream child outcomes. Specifically, this study examined behaviorally coded fidelity data from caregivers who received training in RIT at two timepoints (T2: 3 months after training and T3: 6 months after training). Fidelity was coded via a 6-minute observational sample in which caregivers were instructed to use strategies they were learning with their EI provider. Caregivers were rated on their use of the various components of RIT "None of the time" (0), "Some of the time" (1), or "Most of the time" (2) over the 6 minutes. RIT fidelity components were: (1) Imitates child's play or gestures; (2) Models new actions for the child; (3) Physically prompts the child to imitate; and (4) Praises the child's imitation. The number of full RIT cycles caregivers used (defined as using all components in succession) was also coded. Repeated measures ANOVAs were utilized to determine if caregivers were completing certain fidelity components more frequently than others.

Results: Nineteen caregivers were trained in RIT. Eighteen completed a fidelity assessment at T2 and fifteen completed a fidelity assessment at T3. At T2 78% of caregivers were classified as having low fidelity (defined as not completing at least one RIT cycle during the observation). At T3, 67% of caregivers were classified as having low fidelity. Results of the ANOVA showed a significant effect of fidelity component type on frequency of caregiver use at T2 (See Figure 1). Post hoc comparisons revealed that at T2, parents with low fidelity were more frequently modeling new actions, and less consistently imitating, physically prompting, and praising. Results did not show a significant effect of fidelity component type on frequency of caregiver use at T3 (See Figure 2).

Conclusions: Results suggest that certain components of RIT are consistently more challenging for caregivers to implement. However, this study had a low sample size. Future work in this area should aim to determine if additional coaching or practice for caregivers in specific areas can improve fidelity in a larger implementation study. Future research could also serve to determine if additional coaching leads to downstream effects on child outcomes.



414.259 Examining the Effect of Parental Involvement on Child and Parent Outcomes in the PEERS for Preschoolers (P4P) Social Skills Intervention: A Randomized Controlled Trial

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Background:

Involving parents in social-skills training for autistic children is known to improve intervention effectiveness (DeRosier et al., 2011), since parents facilitate social learning opportunities for their children, and improve the maintenance and generalization of treatment gains (Siller et al., 2018). Parents may also benefit themselves from participating in these interventions (Solomon et al. 2008). The Program for the Education and Enrichment of Relational Skills for Preschoolers (PEERS for Preschoolers; P4P, Laugeson et al., 2024) is a 16-week research-supported, parent-assisted social-skills training program for young autistic children. In P4P, parents attend parallel sessions to their children, learning strategies to support skill practice and facilitate peer-interactions. Previous studies of P4P have demonstrated concurrent improvements in social and caregiving skills (Factor et al., 2022), which were maintained at follow-up (Antezana et al., 2022).

Objectives:

To conduct an Israeli randomized controlled trial, comparing the effects of the parent-supported P4P program to those of a P4P program with minimal parent involvement (P4P-MPI) on children's social-skills and on skills' generalization to school settings.

Methods:

Sixty-nine participants (9 females) aged 4-7 ($M=5.29$, $SD=0.98$), diagnosed with ASD without intellectual disability, were randomly assigned to the standard P4P intervention ($n=34$) or the P4P-MPI ($n=35$). In the P4P-MPI condition, parents received handouts summarizing didactic lessons instead of attending parent sessions. Each intervention group included up to 10 children. Conditions were comparable on age, sex, cognitive abilities, and ADOS-2 scores. Parents and teachers reported pre- and post-intervention on the Social Skills Improvement System (SSIS; Gresham & Elliott, 2008) and the Social Responsiveness Scale, 2nd ed. (SRS-2; Constantino & Gruber, 2012). Parents also completed the Quality of Play Questionnaire (QPQ; Frankel & Mintz, 2011) and the Parenting Stress Index (PSI; Abidin, 2006).

Results:

In the P4P condition, but not in the P4P-MPI, parents reported on improved social-skills, self-control, and empathy and of reduced ASD symptoms of their children on the SSIS. Parents reported no significant changes on the SRS-2. In addition, parents in both groups reported elevated stress across all three PSI subscales (Parental Distress, Difficult Child, and Parent-Child Dysfunctional Interaction), but these increases were statistically significant only in the P4P-MPI condition.

Teachers reported on significant intervention effects for all SSIS subscales, but the P4P condition showed significant improvements on children's communication, responsibility, and engagement, while the P4P-MPI condition showed improvements on children's empathy and self-control. On the SRS-2, teachers of children in the P4P condition reported improvements on the SRS-2 total score and on the Social Communication and Interaction index, and the Social Awareness, and Social Cognition subscales, whereas teachers of children in the P4P-MPI condition reported improvements on the Social Communication and Restricted Interests and Repetitive Behavior subscales.

Conclusions:

Results support the cross-cultural efficacy of P4P and highlight the importance of parental involvement in social-skills interventions for autistic children. Results also indicate that participation in social-skills interventions increases parental stress, but that this stress is moderated when parents participate in the intervention. Moreover, parental involvement appears to enhance the generalization of some learned skills to school settings.

**414.262** Exploring the Intersection of Emotion Dysregulation and Intervention Use in Autistic Children

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Background: Emotion dysregulation (ED) is common in children on the autism spectrum, and can present in a variety of ways in early childhood. Despite the prevalence of ED in autistic children, it is often not the target of early interventions—in fact, none of the most commonly-used interventions are designed to target ED (Beck et al., 2020). That said, ED may have an impact on access to interventions, and existing interventions may already impact ED in a positive or negative way. Understanding the association between ED and receipt of various types of interventions in young autistic children is a first step towards delineating these possible processes.

Objectives: This study aimed to describe receipt of various interventions in a large, diverse sample of autistic preschoolers, and examine associations between intervention use and ED severity.

Methods: The data for this study came from an online, national sample of parents of children ages 2- to 5-years with autism (N=853; Mean age = 4.6, SD= 1.1; 24% female). ED was measured using the Emotion Dysregulation Inventory-Young Child (EDI-YC), a parent report measure characterizing the severity of dysregulation across two dimensions: reactivity (fast, intense emotional reactions) and dysphoria (low positive affect, sadness, unease).

Parents answered questions about the intervention services their child currently receives and any services they have received in the past. They also completed questionnaires regarding child demographics, speaking ability, and autism symptoms.

We calculated the percent of the sample receiving each type of intervention, both in the past and currently. ANOVAs determined whether EDI scores differed between children who were or were not receiving each service type (currently or in the past). Finally, a regression analysis examined unique predictors of EDI scores, including all significant service types, while controlling for variables that were known to be associated with either ED or service use (i.e., income, autism symptoms, parental education, speaking ability).

Results: Speech (77% currently enrolled), occupational (64% currently enrolled), and behavioral (55% currently enrolled) therapy were the three most common therapies, while counseling interventions were uncommon (~5% currently enrolled; see Figure 1). There were several associations between specific interventions and EDI scores (see Figure 2). Children who received behavioral or physical therapy in the past, but not currently, had higher reactivity scores. Children currently receiving counseling services or social skills interventions had higher reactivity and dysphoria. On the other hand, children who received speech therapy, either currently or in the past, had lower reactivity and dysphoria.

Conclusions: Results suggest associations between ED and various intervention types, even when ED is not a direct target. Speech therapy—the most common intervention type—was associated with lower ED, even when controlling for speaking ability. Other intervention types, such as counseling interventions and social skills groups, were associated with increased ED. Although the current study cannot speak to directionality or causality of effects, it is a first step towards understanding the ways ED intersects with early intervention. Future prospective and longitudinal research is needed to continue to better understand these associations.



414.263 Exploring the Relation between Fidelity and Adaptation: Implementing an Ndbi within a Hybrid Type I RCT across Four Public Early Intervention Systems

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Background: Providers often modify evidence-based practices (EBPs) when implementing them in community practice. Modifications to EBPs can be characterized as “fidelity-consistent” and “fidelity-inconsistent” (Wiltsey-Stirman et al., 2019). However, few studies exist to validate this way of thinking, and the true relation between fidelity and modification may be more complex. For example, while implementing core components of an EBP to fidelity may be essential for effectiveness, insisting on fidelity to the adaptable periphery may stifle innovation critical for personalizing care to individuals’ and families’ diverse identities and achieving successful community implementation. This study explores whether different types of modifications complement or detract from fidelity, which will inform future hybrid effectiveness-implementation trials and ultimately help providers make useful modifications.

Objectives: The objective of this study was to assess the relation between ratings of providers’ fidelity of caregiver-implemented reciprocal imitation teaching (CI-RIT) coaching and the amount and type of modifications they made. Does modifying an EBP always affect fidelity? Is our trial’s measurement of modifications capturing our intended construct, or simply measuring low fidelity?

Methods: Within a hybrid type 1 effectiveness-implementation trial (“RISE”), early intervention (EI) providers in the Washington, Michigan, Illinois, and Massachusetts public EI systems were trained in and provided CI-RIT as part of their regular practice. Providers’ ($n=47$) CI-RIT coaching fidelity and modifications were coded from families’ ($n=83$) EI session videos by trained observers. Providers completed surveys on the types of modifications (informed by the FRAME and MADI adaptation frameworks) they made for each family. Providers rated the extent to which they modified CI-RIT on a Likert scale from 1 (“never”) to 5 (“always”). We calculated an overall sum, and sums for items reporting “augmenting” and “reducing” modifications (Lau et al., 2017). Data collection is ongoing.

Results: Providers’ fidelity in CI-RIT coaching was negatively correlated with the overall amount of modification they reported making for that family, $r=-.331$, $p=.008$, such that those who were rated as having high fidelity reported making fewer modifications. While providers’ CI-RIT coaching fidelity was not significantly correlated with their augmenting modifications, $r=-.084$, $p=.510$, it remained negatively correlated with reducing modifications, $r=-.343$, $p=.006$.

Conclusions: Researchers are only recently exploring how to recognize and react to distinct types of modifications that providers regularly make when implementing EBPs in real-world settings (Yu et al., 2021), which has far-reaching implications for EBP effectiveness. Overall coaching fidelity was significantly associated with low modification. This suggests that, as measured in this study, fidelity and modification—especially modifications in which providers remove or reduce CI-RIT coaching elements—are on the same continuum rather than two unique constructs. However, the lack of association between coaching fidelity and modifications in which providers *added* elements to their CI-RIT coaching suggests that augmenting modifications may be somewhat separable from fidelity. Future work for this INSAR presentation will examine additional data on observed (rather than self-report) modifications. We will discuss whether the utility of modifications may vary based on which EBP component is modified, and whether augmenting modifications may enhance CI-RIT effectiveness or implementation within the EI system.

414.264 Facilitating Joint Attention in Young Children with Autism: A Parent-Mediated Intervention Approach **M. Garcia, G. M. Garcia and A. Mastergeorge, Human Development and Family Sciences, Texas Tech University, Lubbock, TX**

Background: Autism Spectrum Disorder (ASD) is a neurodevelopmental condition characterized by deficits in social skills, communication, cognitive abilities, and behavioral competencies, with particular difficulties in developing joint attention (JA). JA is a pivotal skill that emerges in infancy, with the ability to share focus on an object or event with others. It plays a foundational role in early communication development. When JA fails to develop, infants encounter difficulties in communication and social interaction, which can have long-term consequences for developmental trajectories. Since JA activities occur in everyday interactions, parent-mediated interventions often focus on enhancing these skills through everyday parent-child contexts.

Objectives: This study aims to examine the effects a play-based parent-mediated JA-based intervention has on parent verbalization frequency during parent-child social interactions, and to examine possible differences across types of verbalizations and play activities.

Methods: This 16-week parent-mediated intervention study focused on 12 parent-child dyads. The study included two distinct JA play activities: (1) constructing a face on a Mr. Potato Head toy with parent scaffolding the child in a problem-solving activity, and (2) playing with a dump truck, which included activities such as dumping objects in and out and rolling the truck back and forth to encourage turn-taking skills. The Dyadic Parent-Child Interaction Coding System (DPICS) was utilized to assess parent-child social interactions, with a focus on parental verbalizations. These verbalizations included: Acknowledgment, Total Praise, Total Descriptions, Total Questions, and Total Commands. Implementing multiple Wilcoxon Signed-Rank tests, the frequencies of each parent verbalization category were compared across time for the two play activities. Coder inter-rater reliability was conducted on reviewed videos segments based on DPICS criteria and Cohen’s Kappa was 80% for rater agreement. For the purposes of this study, pre-intervention frequencies were compared to the last four weeks of the scaffolding problem-solving activity, the last four weeks of the turn-taking activity, and post-intervention scores. This allowed for an analysis of changes in parent verbalizations within the two activities over the intervention period.

Results: Wilcoxon Signed-Rank test analyses of pre-intervention and post-intervention scores indicated no significant changes in any parent verbalization frequency. However, comparison of pre-intervention and the last four weeks of the scaffolding problem-solving activity scores indicated that Acknowledgment was significantly more prevalent ($z=-2.536$; $p=0.011$) while Total Descriptions ($z=-2.394$; $p=0.017$), Questions ($z=-2.516$; $p=0.012$), and Commands ($z=-2.041$; $p=0.041$) were significantly higher during the pre-intervention phase. Comparison of pre-intervention and turn-taking activity scores indicated that Total Descriptions ($z=-2.810$; $p=0.005$), Questions ($z=-2.703$; $p=0.007$), and Commands ($z=-2.675$; $p=0.007$) were significantly higher during the pre-intervention phase. Total Praise was not significantly different between pre-intervention and activity periods.

Conclusions: While unexpected, the overall decrease in parent verbalizations may be an indicator of increased child verbalizations and dyadic engagement. This highlights the importance of utilizing alternative analytical methods to examine JA and dyadic engagement within parent-mediated interventions. Furthermore, the decreases in parental descriptions, questions, and commands may suggest parental adaptations to increases in child verbal social cues and responses, resulting in fewer prompts and promoting dyadic synchrony.

414.265 Preschool Children with Autism Are More Likely to be Placed in Special Education If They Exhibit Low Cognitive Abilities and Aberrant Behaviors

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Background: In many western countries autistic children can be placed in either special or mainstream preschool educational settings. These settings often differ dramatically in their cost, exposure to typically developing children, expertise and size of the educational staff, and their ability to incorporate structured autism intervention. Surprisingly little research has examined how placement decisions are made or what child characteristics predict placement in one setting versus the other. Previous studies have reported that children with lower cognitive abilities were more likely to be placed in special rather than mainstream preschool settings.

Objectives: To identify the strongest predictors of first year preschool educational placement in special versus mainstream education in Israel.

Methods: We recruited 165 children with autism as they entered their first year of kindergarten, at an average age of 37.86 (SD=4.4) months (i.e., 3-4-years-old). Of these children, 120 (73%) were placed in special education and 45 (27%) in mainstream education. All children completed the Autism Diagnostic Observation Schedule (ADOS-2), and most completed assessment of cognitive abilities with the Bayley or Mullen (n = 114), adaptive behaviors with the Adaptive Behavior Rating Scale 3rd edition (ABAS-3) (n = 113), and aberrant behaviors with the Aberrant Behavior Checklist (ABC) (n = 126). We used t-tests to compare children placed in mainstream versus special education settings and multiple logistic regression to determine the relative contribution of assessment scores in predicting educational placement. We also performed the same comparison across educational settings only with children without intellectual disability (NID, cognitive scores > 80).

Results: Children placed in special education exhibited significantly lower cognitive scores [80.8 vs 68.7; p=0.014], were diagnosed at an earlier age [33.8 vs 30.2; p=0.014] and their mothers had fewer years of education [14.7 vs 13.6; p=0.04]. There were no significant differences across settings in ADOS-2 Calibrated Severity Scores (CSS), ADOS-2 social affect (SA) CSS, ADOS-2 restricted and repetitive behaviors (RRB) CSS, ABAS-3 general score and all 5 subscales of the ABC. However, when isolating the analysis to NID children, those placed in special education exhibited significantly higher ABC: Irritability scores [7.29 vs 14.2; p=0.012]. A logistic regression analysis revealed that ADOS RRB-CSS (OR = 10.98, p = 0.009) and ABC: Irritability scores (OR = 7.01, p = 0.013) were both significant predictors of placement.

Conclusions: These findings suggest that early placement decisions for children with ASD entering kindergarten are primarily influenced by cognitive abilities. However, for children without intellectual disability, severity of repetitive behaviors and irritability are predictors of placement. In contrast the severity of core autism social symptoms does not seem to be a significant factor in placement decisions.

414.266 Assessing Geographic Provider Access By Therapist Type for Children with Autism in Missouri

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Background:

Children diagnosed with Autism Spectrum Disorder (ASD) may require specialized therapy or care not as widely available as other forms of care. Limited numbers of therapists can hinder access, especially in rural areas, or with marginalized communities. Understanding where different types of therapists are in relation to such communities is critical for gaining insight into where targeted support can be provided for improving access to specialized healthcare services for autistic children.

Objectives:

This study's objective was to analyze the distribution of four different types of healthcare services supporting children diagnosed with Autism Spectrum Disorder (ASD) throughout the state of Missouri: applied behavior analysts (ABA), occupational therapists (OT), physical therapists (PT), speech language pathologists (SLP), in relation to children with an IEP code for ASD by their local school district, in the year 2020. We hypothesized a clear need for all 4 types of healthcare providers throughout the state of Missouri, with concentrations in underserved rural areas and densely populated urban areas.

Methods:

By examining the amount of this population group with ASD in Missouri in relation to these four therapy types, a needs assessment can be performed to find health care gaps. This project is modeled from previous geographic needs assessments done in rural communities around care distribution (Carson et al 2021). An additional layer added to this analysis is the inclusion of multiple therapist types by all counties in Missouri. The count of each therapist by county was identified using the Summarize Within tool in ArcGIS Pro, and then compared to the number of children identified in the county listed having ASD, with the number of hours a child with ASD is recommended to spend with each therapist.

Results:

All counties required at least 1 ABA therapist to adequately service the number of students with an IEP for Autism (Figures 1 & 2). OTs (Figures 3 & 4) were needed in the rural northern and southern regions of Missouri and the need for more OTs was clearly relegated primarily to these rural northern and southern areas, with a band of adequate numbers stemming through the middle of the state from St. Louis to Kansas City. PTs (Figures 5 & 6) were clearly needed in rural areas, despite a broader distribution of at least one county retaining a PT, only in the urban areas of the state are there more than enough PT options. For SLPs (Figures 7 & 8) need is concentrated in the urban areas.

Conclusions:

While need for a range of services is clearly an issue throughout the state, there is a clear urban-rural divide dependent on the type of service. St. Louis, Kansas City, Columbia, and Springfield – state population centers – lack ABA and SLPs, with adequate PT and OTs. Although ABA therapists are most starkly needed in urban areas. Understanding access to care requires a spatio-temporal perspective recognizing the tensions between distance, time, and need. Future research will investigate these spatial patterns with more advanced methods, such as the 2-Step Floating Catchment Method.

Poster Session**415 - Interventions - Social, Cognitive, Behavioral and Educational - School-Age, Adolescent, Adult I**

May 1st, 2025, 5:30 PM - 6:30 PM - Hall 4A

415.267 "It Fostered a Greater Appreciation for My Little Corner of the World": A Feasibility Study of a Therapeutic Photography Intervention for the Well-Being of Autistic Youth

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Background: There is a shortage of interventions addressing the promotion of positive emotional (hedonic) and psychological (eudaimonic) states for autistic youth. Therapeutic photography (TP), referring to self-initiated photo-taking paired with mindful reflections of the photographs, has the potential to provide an accessible and scalable approach to promote positive mental health for autistic people.

Objectives: The current study employed a mixed methods approach to evaluate the feasibility of a novel TP intervention aimed at increasing hedonic and eudaimonic well-being among autistic youth.

Methods: Forty-one autistic youth 16 to 25 years of age ($M_{age} = 20.87$; 39% cis-female; 56.1% White; 97.6% with a professional diagnosis of autism) completed a four-week TP intervention. Each week, participants photographed and reflected on a different aspect of positive well-being. Intervention feasibility was determined according to intervention demand, implementation, acceptability, practicality, and preliminary effects (Bowen et al., 2009). Demand and implementation were assessed according to recruitment numbers, participant adherence, and engagement in TP. Practicality was determined according to two items from the Implementation Acceptability Scale (Lee et al., 2022). Acceptability was assessed using the 4-item Acceptability of Intervention Measure (AIM; Weiner et al., 2017), the 4-item Intervention Appropriateness Measure (IAM; Weiner et al., 2017), and the 20-item Negative Effects Questionnaire (NEQ; Rozental et al., 2019). Changes in hedonic and eudaimonic well-being were captured using the 20-item EPOCH Measure of Adolescent Well-being (Kern et al., 2016), the 4-item Meaning and Purpose Scale (PROMIS-MP; Salsman et al., 2020), the Generalized Anxiety Disorder 7-item Scale (GAD-7; Spitzer et al., 2006), and Patient Health Questionnaire 9-item Scale (PHQ-9; Kroenke et al., 2001). Qualitative findings were gathered using semi-structured interviews surveying the benefits, challenges, and possible adaptations for the intervention.

Results: Recruitment efforts were successful and intervention adherence and engagement were high (Figure 1). Participants indicated high levels of acceptability on the AIM ($M = 4.06$, $SD = .80$) and the IAM ($M = 3.86$, $SD = .90$). Fifteen participants (41.7%) attributed at least one negative effect to TP on the NEQ; however, the average negative impact of these effects was very low ($M = 0.67$, $SD = 1.43$). On the IAS, 94.4% of participants noted that they did not have to give up resources to participate in TP and 80.6% found the amount of effort required for TP to be acceptable. In terms of preliminary effects, repeated measures ANCOVAs, controlling for FSIQ, indicated significant improvements in full scale EPOCH scores ($F(1,34) = 10.17$, $p = .003$, $\eta^2 = .23$). Paired samples t -tests revealed significant improvements in experiences of meaning and purpose (i.e., PROMIS-MP; $t(35) = 2.71$, $p = .01$, $d = .45$) and no significant differences between pre- and post-intervention in anxiety and depressive symptoms ($p > .05$). Qualitative reports provided valuable insights regarding benefits, challenges, and future adaptations for TP (Figure 2).

Conclusions: Therapeutic photography is a promising and feasible novel intervention for the promotion of well-being for autistic youth. Future research efforts should be invested in examining the feasibility of an RCT and exploring mechanisms of change related to TP.



415.268 A 12-Month Reading Intervention for Autistic Students That Require Augmentative and Alternative Communication: A Multiple Single-Case Design

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Background: For autistic children, requiring augmentative and alternative communication (AAC) reading skills are key to achieve higher levels of communication, for example from AAC systems that use graphic symbols to orthography (Caron et al., 2018), and to independently express themselves (Light & McNaughton, 2020). For this population there may be many barriers to developing reading skills, and previous research has mainly focused on those with verbal communication skills (Westerveld et al., 2017).

Objectives: This study investigated effects of a reading skills intervention for autistic students who require AAC. The research questions were: Is there a functional relationship between the use of the reading material "Reading for all" and increased accuracy of a) sound blending, b) letter sound correspondence, c) phoneme segmentation, d) improved acquisition of recognition of sight words, and e) decoding.

Methods: This study was conducted with a multiple single-case design with multiple randomized baselines. A total of 26 students (6-13 years, 21 boys, 5 girls) diagnosed with autism (13 with intellectual disability) and requiring ACC were included in the present analysis. The majority of the sample was minimally verbal. Both parents and teachers consented to participation. The reading material "Reading for all" is based on the research of Accessible Literacy Learning (ALL) (Light & McNaughton, 2011). The intervention targeted phonological awareness skills, letter-sound correspondence, shared reading, recognition of sight words and word decoding for 12 months. Oral responses were not required for the students. Direct and systematic instruction, explicit instruction, scaffolding, immediate and corrective feedback, cumulative review and practice were emphasized. Primary outcomes were assessed 12 times in equidistant time points across the 12 months. All the tests were developed by the researchers (described in Ulriksen et al., 2023). The students were assessed in letter sound correspondence, sound blending, and phoneme segmentation each month (12 times), and assessed in sight words and decoding in months 1 and 12. Baselines were randomized using PASS23 via Wei's urn algorithm that minimizes unbalanced groups (Wei & Lachin, 1988). This is an open-label study, hence not possible to mask intervention start (baseline) for the students. However, two assessors coded outcomes independently.

Results: The data indicates that many students have achieved early literacy skills, such as phonological awareness and letter sound skills, which is necessary for later reading skills. Several students have also demonstrated reading skills, phonologically. Analyses of effect-change will be presented at INSAR. The results are presented in graphs that demonstrate each student's development.

Conclusions: Due to lack of competence, evidence-based reading programs and expectations, it is crucial to emphasize the importance of such reading interventions. To raise awareness and expectations that students with limited or missing speech ability can acquire functional reading skills is essential, and can change the individual's opportunities in many areas.



415.269 Pilot Study of a Brief Inclusive Peer Intervention in Middle School: Staff and Student Perspectives on Inclusion

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Background: Peer relationships are essential to every child, yet students with neurodevelopmental disabilities (SWDs) are frequently isolated due to limited opportunities for SWDs to interact with peers in general, including in extracurricular activities, and few school staff taking responsibility to facilitate or plan these opportunities. Educating classroom peers about disabilities and facilitating interactions between SWDs and their classroom peers can improve peer perceptions of disability and the social lives of SWDs. However, there is a scarcity in these interventions in middle school and high school despite evidence that shows that older students tend to hold more negative attitudes towards SWDs.

Objectives: This pilot study explored experiences with and the effects of a brief peer-focused intervention in a middle school. The intervention incorporated (1) education to peers (and educators) about disability and strategies to engage with SWDs, and (2) facilitated opportunities for social interactions between peers and SWDs through activity-based recess clubs. Specific research objectives were: (1) to explore the effects of the intervention on peer attitudes towards SWDs and (2) to understand SWDs, classroom peers, and staff perspectives of the intervention on understanding, acceptance, and social in/exclusion of SWDs.

Methods: A mixed-methods, convergent parallel design was used. Participants were three SWDs (two in one classroom, one in another), and their classroom peers and teachers. Peer attitudes towards SWDs were measured using the Revised Chedoke-McMaster Attitudes Towards Children with Handicaps Questionnaire (CATCH-R) pre and post the educational intervention. Wilcoxon test was used to analyze pre-post differences overall (all students combined) and the Mann-Whitney test was used to analyze pre-post differences by class and for students who did and did not choose to participate in the recess club. Rank biserial correlation was calculated as the effect size for the Mann-Whitney test. Thematic analysis of data from semi-structured interviews with SWDs, peers, and school staff following the recess clubs explored perceived impacts of the multi-component intervention on inclusion.

Results: CATCH-R scores indicated a significant difference in peer attitudes towards SWDs post-educational intervention between students who did ($n = 13$) and did not ($n = 21$) choose to participate in the recess club ($U = 197.500$, $N1 = 13$, $N2 = 21$, $p = .029$). Interviews (2 SWDs, 8 peers, 2 school staff) generated three themes: (1) *Increased knowledge and understanding about SWDs*, (2) *Structured activity increased interaction between SWDs and peers*, (3) *More in-depth class education and recess club sessions are needed to influence inclusion*.

Conclusions: This intervention was novel in that it included both the class-wide intervention and the small-group intervention, that it was targeted to middle school, and that it was done during the school day (a real-life context) and led by school staff. Overall, findings indicate that a brief peer-focused intervention that includes class-wide educational and facilitated social interaction components can support social inclusion for SWDs in middle school. This has important implications for planning interventions to support social inclusion for SWDs in middle school in the future.

415.270 Enhancing Caregiver Wellbeing: A Scoping Review of Group-Based Mental Health Interventions for Parents of Autistic Children

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Background: The mental health of caregivers of children on the autism spectrum is often overlooked, despite research showing elevated levels of stress, anxiety, and depression among these caregivers. Interventionists and therapists typically focus on the needs of the child, neglecting the crucial role caregivers play in supporting the child's wellbeing.

Objectives: This scoping review aims to explore group-based mental health interventions for caregivers of children on the autism spectrum to identify strategies that reduce caregiver stress, anxiety, and depression while improving their overall quality of life.

Methods: The review was conducted following the Preferred Reporting Items for Scoping Reviews (PRISMA) guidelines and included articles in English that examined randomized control trials (RCTs), controlled clinical trials (CCTs), cohort studies, and qualitative studies with caregiver interventions in group settings. Two reviewers independently screened titles, abstracts, and full texts in Covidence. The inclusion criteria focused on studies involving caregivers of children over 10 years old on the autism spectrum and interventions aimed at improving caregiver mental health. Articles were sourced from PubMed, CINAHL, and PsycINFO, with searches conducted in August 2024.

Results: A total of 24 studies were included in this review. Various themes emerged from a thorough analysis of the articles including mindful movement, parent to parent interventions, mindfulness-based parenting, and cognitive change. Mindfulness-based interventions, involving both parents and children, were the most effective in reducing caregiver stress and improving wellbeing. Interventions focused on peer support also showed positive mental health outcomes but had mixed results in reducing stress.

Conclusions: The findings suggest that group-based interventions, particularly those focusing on mindfulness and peer support, can significantly improve the mental health of caregivers of children on the autism spectrum. However, the evidence regarding the reduction of parenting stress remains mixed across studies. Future research should further investigate the most effective group intervention components and the potential role of OTPs in supporting caregiver mental health, to enhance family wellbeing.

415.271 A Preliminary Look at Unique and Shared Influences on the Implementation of Two Middle School Programs for Autism

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Background: Schools play a critical role in caring for autistic youth, often serving as the primary setting where services are delivered. As the number of autistic students in schools continues to grow, ensuring that schools are equipped to deliver effective, evidence-based services is essential. This is especially crucial during the middle school years when many autistic students, particularly those accessing the general curriculum, increasingly experience social communication and executive functioning challenges that hinder academic performance, peer relationships, and overall functioning. This underscores the importance of schools implementing programs that address these specific areas of need. However, the range of social skills and executive functioning programs available—particularly those relevant for and effective in middle schools—remains limited. Research examining these programs in real-world school settings, particularly with a focus on factors that influence successful implementation, is needed to inform ongoing and future efforts to enhance school services for autistic students.

Objectives: The current study aims to examine the unique and shared factors (i.e., barriers and facilitators) influencing the implementation of the *Program for the Education and Enrichment of Relational Skills (PEERS)* social skills and *Unstuck and On Target (Unstuck)* executive function programs in public middle schools.

Methods: Data are drawn from a larger multisite cluster randomized control trial of *PEERS* and *Unstuck* in public middle schools. Qualitative interviews with school-based implementers (n=23, 96% female, 48% Non-Hispanic White, 61% special educators and 17% speech language pathologists) who received training in and delivered *PEERS* or *Unstuck* with participating autistic students were conducted. Interviews gathered perspectives regarding implementers' experiences delivering *PEERS* and *Unstuck* and factors that influenced their delivery. Data were analyzed using a rapid qualitative assessment process (Hamilton, 2020) that yielded themes regarding barriers and facilitators of implementation.

Results: Results indicated several shared facilitators of implementation for both *PEERS* and *Unstuck*, including the manualized nature of the program and availability of corresponding materials (e.g., PowerPoints, videos) that aided ease of delivery as well as a focus on skill areas extremely relevant for autistic students. Shared implementation barriers included the repeated focus on certain skill areas across lessons that made it challenging to maintain student engagement. For *PEERS*, unique barriers included challenges implementing the motivational system and homework extensions specified in the curriculum while the specified behavioral rehearsals activities specified facilitated implementation. For *Unstuck*, the number and varying nature of prespecified activities were often challenging, representing an implementation barrier, while the multimodal approach and scripted vocabulary integrated across lessons facilitated delivery.

Conclusions: Findings highlight key shared and unique influences of program implementation in middle schools. Findings from this study have the potential to significantly inform ongoing and future efforts to translate evidence-based programs into schools on a broader scale and address issues of feasibility. By identifying the factors supporting or hindering program implementation, researchers and educators can better ensure that autistic students receive the high-quality, targeted support they need. In the long term, this research could lead to more effective strategies for delivering evidence-based practices in schools, ultimately improving outcomes for autistic youth across the country.

415.272 A Qualitative Exploration of Autistic Perspectives: Experiences with Mathematics Education

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Background: While previous research has examined challenges autistic students experience in mathematics education, studies examining mathematics challenges from the perspectives of autistic youth are scarce. Thus, we conducted a study to highlight the unique perspectives and experiences of autistic young adults in K-12 mathematics education to raise awareness, promote inclusive and effective teaching practices.

Objectives: The aim of this study was to qualitatively explore the experiences of autistic youth in k-12 mathematics education in the US. Specifically, we examined the supports autistic youth received and challenges they experienced during their mathematics education.

Methods: In this exploratory study, we employed semi-structured in-depth interviews with 11 autistic young adults (ages 18-28). Participants were recruited through snowball sampling via online networks, including disability advocacy groups and social media platforms. The eligibility criteria included both, self-identified and formally diagnosed autistic individuals. Data collection took place through Zoom interviews, which were recorded, and then transcribed for coding and analysis. The data was analyzed using inductive thematic analysis.

Results: The findings from the interviews revealed several key themes related to their experiences in K-12 mathematics education. Participants reported that their challenges in math often stemmed from difficulties with processing abstract mathematical concepts, and inconsistencies in teacher support. Many expressed that traditional teaching methods, which heavily rely on verbal explanations and abstract reasoning, were difficult to follow. Instead, they found visual aids, step-by-step instructions, and hands-on activities to be more effective in enhancing their understanding. Additionally, they appreciated the use of interactive technologies such as math apps or digital manipulatives, which allowed them to work at their own pace and revisit concepts as needed. Social interactions in the classroom also presented a challenge. Participants mentioned that group work or having to explain their reasoning in front of the class heightened their anxiety. Overall, participants expressed a desire for teachers to be more aware of and responsive to their needs, offering accommodations that reduce stress and allow for better focus and engagement.

Conclusions: The results of this study contribute valuable insights into the experiences of autistic youth in K-12 mathematics education. By identifying key challenges and supports, this research will help inform the development of more inclusive mathematics curricula and teaching practices. Moreover, the study highlights the importance of incorporating the perspectives of neurodiverse individuals when designing educational interventions, particularly in mathematics, where autistic students do not feel supported.

415.274 A Special Educator-Mediated Training Program Improves the Ability to Recognize Basic Emotion in Adolescents with Autism: Results from a Pilot Study

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Background:

Emotions are vital indicators of the psycho-physiological state of humans and can greatly help in improving intelligent healthcare services. In children with autism there is significant impairment in recognizing and understanding basic facial emotions and prototypical feelings. This "Emotional misunderstanding" directly affects social interaction.

Objectives:

The aim of the study is to investigate three emotion-related constructs in children with ASD, namely: emotion recognition, emotional regulation and understanding of emotions, and to carry out training aimed at increasing knowledge of emotions and learning useful techniques for controlling negative feelings such as fear, anger and anxiety.

Methods:

Eighteen subjects (15 males and 3 females) aged between 13 and 18 years participated in the research (mean age = 15.2; ds = 1.44) with severe (No.9) or moderate (No.9) disability at Developmental Disability Child Global Assessment Scale (DD-CGAS).

The special training program educator mediated, consisted in twenty weekly sessions each lasting approximately two hours, conducted using two protocols inspired by Rational Emotional Therapy of Albert Ellis: "Exploring Feelings", and "The ABC of my emotions: socio-affective literacy program".

The training aimed at enhancing the knowledge of the main emotions and learning effective cognitive strategies to overcome and manage negative thoughts and moods, aiming to increase pleasant ones in everyday life.

The Test of Emotion Comprehension (TEC) was applied before and after the training program.

Results:

The training program was associated to a significant improvement of the Total score of TEC, which increased from (mean(SD)) 4.27(2.21) to 5.33 (2.40); $p < 0.001$; with an effect size of 0.45. Most participants (15 out of 18) showed a positive change in the TEC total score. The magnitude of score change was higher in the severe disability group with a 47.6% improvement (from 2.33 to 3.44) in comparison with moderate disability group, with a 16% improvement (from 6.22 to 7.22).

Conclusions:

An intensive training educator mediated based on Rational Emotional Therapy seems effective in improving emotion comprehension in adolescent with autism, especially in those with severe disability. These evidences support the planning of a randomized study.

415.275 Identifying Challenging Environments: Designing a Virtual Reality Intervention for Adolescents with Autism Spectrum Disorder through Their Perspective

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Background:

Individuals with autism spectrum disorder (ASD) face significant challenges in social skills and executive functions, affecting daily functioning and quality of life. Existing interventions often show limited effectiveness with poor generalization to real-life scenarios. There is a pressing need for interventions tailored to adolescents with ASD, incorporating training in realistic environments that include their input.

Objectives: 1) To explore adolescents with ASD's perspectives on social skills and executive function challenges by mapping challenging environments, difficulties, and needs. 2. To compare these perspectives with those of parents and therapists. These insights will inform the design of a Virtual Reality (VR) intervention.

Methods: Participants included 40 adolescents with ASD (34 boys, six girls; mean age 15.3), 36 parents (20 men, 15 women, 1 non-binary; mean age 47.07), and 36 health/education professionals. All completed a specially designed questionnaire assessing challenging environments, their characteristics, and associated difficulties.

Results:

A mixed two-factor ANOVA with repeated measures examined the functional importance of environments for adolescents with ASD from the perspectives of three groups of evaluators (adolescents, parents, and caregivers). Significant main effects were found for group [$F(2,109) = 12.06$, $p < .001$, $\eta^2p = 0.18$], environment type [$F(8,872) = 16.61$, $p < .001$, $\eta^2p = 0.13$], and a significant group x environment interaction [$F(16,872) = 3.91$, $p < .001$, $\eta^2p = 0.67$]. Adolescents consistently rated environments less important than parents and caregivers, with social media, school, and shopping malls ranked highest. In contrast, parents and caregivers rated public transportation and supermarkets as significantly more important ($p < .01$) than adolescents. Adolescents identified schoolyards during recess, mall food courts, and cashier interactions as most challenging. Their greatest difficulties included self-explanation, initiating contact, or responding to unfamiliar people, with sensory stimuli such as noise, crowding, and large groups as most disturbing. Parents prioritized youth movement as an important and preferred VR training environment, while therapists emphasized supermarkets and rated difficulties the highest across all areas. Both parents and therapists emphasized public transportation as important. Despite the differences between evaluators, agreement was found in several key environments, including the school cafeteria, social media, and shopping malls, as well as on key challenges (coping with new situations) and disturbing sensory stimuli (noise and overcrowding).

Conclusions:

The findings reveal a discrepancy between evaluators, with adolescents rating their challenges as less severe and prioritizing training environments lower than parents and therapists. This highlights adolescents' distinct perspectives and the need to integrate their unique viewpoints into intervention designs. Despite differences, there was agreement on key environments such as schools and shopping malls and consensus on challenges, such as sustainable peer interaction, which provide a foundation for designing VR environments that target social skills and executive functions, incorporating sensory stimuli to enhance real-world generalization. Recommendations include developing a VR environment centered on school settings (recess, classrooms, cafeterias), where skills training focuses on self-explanation, coping with new situations, and managing sensory stimuli such as noise and crowding.

415.276 A Systematic Review of Oral Care Interventions for Autistic Individuals across the Lifespan

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Background:

Oral health is important to both physical and psychological health. Certain populations, such as autistic individuals, experience greater oral care disparities as compared to typically developing individuals, suggesting that innovative and efficacious interventions to facilitate care are needed. However, little research currently exists examining oral interventions for autistic individuals.

Objectives:

The primary research question that guided this systematic review was: What are the impacts of non-pharmacological oral care interventions for autistic individuals? In addition, we asked: What is the methodological strength of the research reported in each study?

Methods:

Systematic review methodology as outlined in the Cochrane Handbook for Systematic Reviews of Interventions was used for this paper. Six electronic databases were searched, including: PubMed, CINAHL, Web of Science, Clinical Trials, COCHRANE, and PsycINFO using the keywords “oral/dental health/care,” “intervention,” and “autism.” Inclusion criteria for article selection included: (1) implementation and investigation of a home and/or dental office intervention to impact oral care health and/or experiences, (2) participants diagnosed as autistic, (3) published in a peer-reviewed journal, and (4) published in English, Spanish and/or Portuguese. No restrictions were placed on year of publication or level of evidence, but pharmacological interventions were excluded. Two reviewers independently screened all articles for inclusion. Of the articles included, three reviewers independently extracted data. Methodological quality of studies was assessed by two reviewers using Reichow, Volkmar, & Cicchetti’s Evaluative Method for Determining Evidence Based Practice (EBP) in Autism; disagreements were resolved by a third reviewer to reach consensus.

Results:

The search produced 545 articles, with 36 studies meeting all inclusion criteria. Using the EBP guidelines, methodological quality of the articles were assessed as “strong” (n=5), “adequate” (n = 8), or “weak” (n = 23). The studies focused on improving home-based oral care skills and routines, and reducing fear, anxiety, and/or negative behaviors in the dental clinic. Studies incorporated preparatory interventions to support home-based hygiene activities or improve an approaching dental encounter (n = 29), most often using visual aids, and/or strategies to manage behavioral difficulties exhibited in the dental office (n = 17). Some studies used both approaches (n = 10), combining visual aids prior to a visit with behavior management in the dental office. Only one study purposefully recruited autistic adults and no studies included intervention elements tailored to race/ethnicity, culture, and/or socioeconomic status with the others focused solely on pediatric autistic populations.

Conclusions:

Findings provide preliminary support for preparatory homebased visual interventions to improve toothbrushing and/or ready patients for dental visits, and distraction or sensory reducing interventions to improve experiences in the dental clinic. Only one study purposefully recruited autistic adults and no studies included intervention elements tailored to race/ethnicity, culture, and/or socioeconomic status. This review highlights the need for high-quality studies investigating the impact of oral care-related interventions for autistic individuals and identifies a gap in interventions for autistic adults and those from minoritized populations.

415.277 ADAPT: A Mixed-Methods Pilot Test of an Intervention to Address Substance Use Disorders Among Autistic Adults

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Background:

Unhealthy substance use is a public health problem with serious implications for relationships, education prospects, employment and health. Substance use disorders (SUDs) may be just as prevalent, or even more prevalent, among autistic adults versus non-autistic adults. For example, a population-based case-control study ($n=29,986$) found that autistic people had double the risk of alcohol use disorder compared to neurotypical family members. Studies suggest that some autistic people use substances to cope with co-occurring mental health conditions, perceived social difficulties, and sensory sensitivities, and using alcohol to cope is a risk factor for unhealthy use.

There are no evidence-based SUD interventions established to be effective for autistic people. The Alcohol and Drug Choices for People on the Autism Spectrum (ADAPT) workshop is an online, group-based intervention comprising six 90-minute weekly sessions for autistic people who want more control over their substance use. ADAPT was developed in collaboration with an autistic advisory board, and all ADAPT sessions are facilitated by an autistic substance use expert.

Objectives:

To test the feasibility, acceptability, and preliminary efficacy of ADAPT.

Methods:

We recruited 40 adults (Mean age=34, SD=10) with formal (65%) or self-diagnosis (35%) of autism to participate in a waitlist-controlled trial evaluation of ADAPT, delivered via Zoom in April-August 2023. Participants signed up for their desired timeframe and were therefore considered active treatment (April, June) or waitlist control (May, August). Each group (three total) consisted of 15-20 participants. Facilitators presented didactic content on substance use norms, creating personal goals, strengthening motivation, social support, coping with cravings, healthy lifestyles, and setbacks/relapse strategies.

We collected data from autistic participants on ADAPT feasibility and acceptability. We also collected self-report data to assess primary (e.g., coping with cravings) and secondary outcomes (e.g., social isolation, depression).

Data from participants in the active treatment condition were compared to waitlist control data using appropriate statistical analyses (e.g., chi square, t-test), placing emphasis on effect size versus p-values using Hedge's g within group effect size metric (0.2=small, 0.5=medium, 0.8=large).

Results:

Overall, 40 of 64 screened individuals enrolled (Table 1). Of these, 88.2% ($n=35$) completed 5-6 sessions and were included in analyses. There were no statistically significant differences in demographics or outcome measures at baseline for active treatment versus waitlist control groups. Participants rated the workshop overall 8 out of 10 (with 10 being more positive). 90% said it helped them get in touch with motivation to change, 87% that it helped increase motivation to change and helped them create goals for substance use, and 74% that it helped improve their ability to cope with cravings. Preliminary tests of efficacy suggest that the active treatment group experienced improvements in use of coping strategies for cravings ($g=1.05$), social isolation ($g=0.54$), and depression symptoms ($g=0.50$). Participants in the active treatment group improved on depression symptoms compared to waitlist controls, and results were statistically significant ($p=.042$; Table 2).

Conclusions:

ADAPT is a promising treatment for substance use problems among autistic adults. Additional research that uses more rigorous methods, such as RCT, is a logical next step.



415.278 ADEPT-2 Randomised Controlled Trial of a Low-Intensity Psychological Intervention for Autistic People Experiencing Depression: A Qualitative Evaluation

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Background: Autistic adults frequently report high rates of depression. The differences in social communication, neurocognition, and emotional awareness within autistic individuals underscores the need to adapt psychosocial treatments. Studies consistently show that healthcare clinicians often possess limited knowledge about autism, while autistic individuals face significant barriers in accessing mental healthcare. Consequently, there is a clear need for an empirically supported psychological intervention specifically tailored to address depression in autistic adults. The multi-centre Autism Depression Trial (ADEPT-2) was a randomised controlled trial (RCT) designed to evaluate an adapted low-intensity psychological intervention (Guided Self-Help) for depression in autistic adults.

Objectives: This qualitative evaluation aimed to investigate the views and experiences of the ADEPT-2 RCT and the guided self-help intervention.

Methods: Autistic adults experiencing depression (PHQ-9 score ≥ 10)—were randomly assigned to either Guided Self-Help (GSH), a low-intensity psychological intervention based on Behavioural Activation adapted for autistic adults, or NHS Treatment as Usual (TAU). A total of 37 trial participants (23 in GSH, 14 in TAU) and 12 low-intensity psychological therapists (or "coaches") were interviewed, with their transcripts analysed thematically.

Results: Participants and coaches both expressed positive attitudes towards the research, acknowledging the importance of an intervention for depression tailored to autistic adults. Online processes and clear communication with the research teams helped facilitate their participation in the trial. Participants in the TAU arm reported difficulties in accessing mental health services, as well as inconsistencies in healthcare professionals' awareness of autism. Conversely, GSH arm participants valued the sessions with coaches who demonstrated a strong understanding of autism and made adjustments to meet their needs. Many GSH participants continued using the skills they had learned to manage their depressive symptoms and reported feeling better equipped to cope with challenges after completing the intervention. Coaches indicated that the training and supervision provided were comprehensive, and they were able to maintain fidelity to treatment principles within the trial protocol. Suggestions for improvement included offering more flexibility in pacing (adapting session speed to individual needs), splitting sessions when necessary, and providing optional follow-up sessions.

Conclusions: The qualitative assessment demonstrated that it is feasible to deliver an RCT to evaluate the effectiveness of a new low-intensity psychological intervention for depression in autistic adults. Further adaptations outside the constraints of a trial protocol could enhance the accessibility of GSH to a broader and more diverse range of autistic individuals. If the trial demonstrates that GSH is effective, the GSH materials could be implemented by mental healthcare providers.

415.279 AI-Based Auditory Intervention for Autistic Individuals with Decreased Sound Tolerance: Improved Comfort in Virtual Reality and Community Settings

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Background: Decreased sound tolerance (DST) is a common sensory sensitivity in autism, where everyday noises can be overwhelming and upsetting for those affected (Williams et al., 2021). DST causes significant emotional discomfort and limits engagement in daily activities (Scheerer et al., 2022). Consequently, creating interventions to improve comfort and auditory accessibility for autistic individuals experiencing DST is crucial.

Objectives: The aim of this study was to investigate the effectiveness of an AI-based auditory intervention on comfort levels in autistic youth and adults with DST.

Methods: The current study evaluated an auditory intervention across two phases. For Study 1, 20 autistic participants with DST (9 male, 8 female, 3 agender/nonbinary), ages 12 to 47 years old ($M=19.45$, $SD=10.82$) were exposed to a series of auditory trials within virtual reality (VR) environments. Participants rated their comfort with these trials using a five-point scale (1=Very Comfortable, 3=Neutral, 5=Very Uncomfortable). These trials included exposure to aversive sounds presented unaltered, with a masking sound, with active noise cancellation (ANC) or filtered out using the technology. Filtration, masking, and ANC either occurred throughout the trial or were activated only once the software detected the aversive sound.

For Study 2, 10 autistic participants with DST (3 male, 3 female, 4 agender/nonbinary) ages 14 to 52 years old ($M=23.50$, $SD=11.12$) participated in a field-testing session to test the sound management technology in the community. Participants accessed the technology on a mobile app, where they set their preferred sound management method. When the software detected an aversive sound, participants could choose to have it respond by automatically turning on ANC, a masking sound, or both. Participants rated their comfort with listening to prerecorded aversive sounds and with naturally occurring aversive sounds while using the mobile app.

Results: For Study 1, participants' comfort ratings varied significantly across intervention types, $F(6,114)=11.54$, $p<.001$. Specifically, participants reported greater comfort listening to aversive sounds when the software detected and responded to the aversive sound by turning on filtration, masking, or ANC, compared to listening to aversive sounds unaltered. Similarly, in Study 2, participants reported greater comfort listening to prerecorded aversive sounds while using the sound management technology ($M=2.64$) compared to when listening to the sounds unaltered ($M=3.56$) while in a public community setting, $t(9)=4.12$, $p=.003$. Qualitative feedback gathered from both studies support the utility of this technology (e.g., "takes away the piece about having to predict what is going to happen") and provides directions for further development (e.g., "more masking sounds and more kinds of sounds it blocks").

Conclusions: This study evaluated the effectiveness of an AI-based auditory intervention at increasing comfort for autistic individuals with DST when exposed to aversive sounds. In Study 1, the sound management technology improved comfort levels during virtual reality trials in the lab. In Study 2, the sound management technology improved comfort in a noisy community setting, providing support for the intervention's practical application in everyday environments. These findings support the effectiveness of an AI-based auditory intervention for improving comfort in autistic individuals with DST.

**415.280** Adaptability and Efficacy of LEGO Therapy in Italy: A Randomized Controlled Trial

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Background: Interventions aimed at enhancing social skills are critical for improving the quality of life in individuals with Autism Spectrum Disorder (ASD), especially during adolescence, a period marked by increased social demands. LEGO Therapy, a play-based intervention using LEGO building activities, has emerged as a promising approach to foster social skills in children with ASD. While preliminary evidence supports its effectiveness, rigorous RCT are necessary to validate these findings.

Objectives: The primary objective of this study was to evaluate the efficacy of LEGO Therapy in improving social communication and interaction skills in adolescents with ASD aged 11 to 13. Specifically, the study aimed to compare the social outcomes of boys who participated in LEGO Therapy to those who received no such intervention. Secondary objectives included evaluating the intervention's acceptability and feasibility, as well as understanding the impact of therapy on the severity of social symptoms, as measured by standardized autism diagnostic tools.

Methods: This randomized controlled trial included 48 boys diagnosed with ASD, aged between 11 and 13, divided into an experimental group (n=24) and a control group (n=24). The experimental group participated in LEGO Therapy sessions, while the control group received no specific intervention. The two groups were matched for autism severity, intellectual functioning, and age and no significant differences were showed. The intervention consisted of 12 weekly 60-minute sessions over three months, with four groups of six children. Each group was conducted by two specialized educators, and one LEGO brick model builder facilitating each session. Outcome measures were assessed at baseline (T0) and post-intervention (T1, after three months) using the ADOS-BOSCC/FP2 (provided by WPS for the sole purpose of this study) and other standardized tests such as: Social Responsiveness Scale; Stanford Social Dimensions Scale (SSDS); This study was registered at ClinicalTrials.gov (registration number: NCT06641583).

Results: Attendance was high, with 18 children attending all sessions and 6 children missing only 2 sessions. The LEGO Therapy group demonstrated significant improvements in social communication behaviors compared to the control group. Specifically, the experimental group showed a marked improvements in attention skills, turn-taking, and cooperative play behaviors. The control group, by contrast, exhibited no significant changes in these domains over the study period. Attendance and engagement in the sessions were high, supporting the feasibility of LEGO Therapy as a group intervention. No significant adverse events were reported, and feedback from parents and educators indicated a high level of satisfaction with the intervention.

Conclusions: This randomized controlled trial provides evidence supporting the efficacy of LEGO Therapy in enhancing social skills in boys with ASD. The intervention led to significant improvements in social communication and interaction, as reflected in standardized outcome measures. The high level of participant engagement and positive feedback from educators and parents further support the feasibility and acceptability of LEGO Therapy as a social skills 'Naturalistic Developmental Behavior Intervention' for children with ASD. Future research should explore long-term outcomes and the potential for scaling this intervention to other age groups and settings.

415.281 Adapting Evidence-Based PTSD Interventions for Individuals with Neurodevelopmental Disabilities: Exploratory Findings on a Social Story Framework for Post-Disaster Recovery

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Background:

The August 8, 2023 wildfires in Maui exposed critical gaps in disaster recovery for individuals with autism and other neurodevelopmental disabilities (NDD). Traditional post-traumatic stress disorder (PTSD) interventions often lack accessibility for this population, highlighting the need for adapted, trauma-specific tools that integrate both mental health and disability support needs. This research explores the adaptation of evidence-based PTSD interventions for individuals with NDD, utilizing a social story framework and approach grounded in Dissemination & Implementation (D&I) science to ensure scalability and real-world impact.

Objectives:

This exploratory research aims to:

1. Adapt elements of evidence-based PTSD interventions to meet the specific needs of individuals with NDD.
2. Develop and implement a social story workbook as a trauma support tool for use by individuals with NDD, families, support staff, and mental health clinicians.
3. Assess initial effectiveness and satisfaction with the adapted intervention.

Methods:

A toolkit was developed through a collaboration between the University of Hawai'i Center on Disability Studies (CDS) and the Department of Health Developmental Disabilities Division (DDD). It incorporates "active ingredients" from evidence-based PTSD practices into a social story format to enhance accessibility. The toolkit includes separate workbooks for children and teens/adults, along with supplementary materials for caregivers and support staff.

Workshops utilizing the toolkit were conducted at adult day health programs, such as Easterseals Hawaii and Arc of Maui, with 60 individuals with NDD and their support staff participating. Additionally, webinars targeting a broader audience of 146 participants, including families, individuals, support staff, and clinicians, were conducted. Data were collected via post-session satisfaction surveys and qualitative feedback from participants, focusing on usability, content adaptation, and perceived benefits.

Results:

Preliminary results show high levels of satisfaction with the social story workbooks across both workshops and webinars. Participants found the format accessible, clear, and relevant in responding to traumatic stress. Qualitative feedback from individuals with NDD and their families emphasized the workbook's ease of use and ability to foster a sense of control during recovery. Support staff noted improvements in communication and engagement during trauma recovery discussions with their clients.

Although quantitative data on long-term impacts are still being gathered, these initial findings suggest that the workbook intervention has strong potential as a scalable and accessible resource for individuals with NDD in post-disaster recovery.

Conclusions:

This exploratory research demonstrates the feasibility of adapting evidence-based PTSD interventions for individuals with NDD through a social story framework. High levels of satisfaction and positive feedback from participants suggest the promise of this approach. Further research, including longitudinal studies, is needed to evaluate the toolkit's long-term effectiveness and its broader applicability to other traumatic contexts. Expanding the toolkit's dissemination through webinars and community outreach represents a scalable model for disaster recovery support tailored to individuals with NDD.

415.282 Adapting Universal Design for Learning to the Informal Learning Environment with Autistic Teens and Museum Educators
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Background:

While Universal Design for Learning (UDL) has become prevalent in formal learning environments, little research has been conducted on how UDL can be expanded into the informal learning sector, where many challenges prevent its implementation. Instead of designing museum exhibits and experiences with autistic learners in mind, many museums offer select times where sensory triggers are reduced, and where supports are provided to create an inclusive learning experience. While this can be beneficial to some, it can also isolate autistic individuals from their neurotypical peers, and prevent individuals who may not have a diagnosis (or who are not comfortable with disclosing diagnosis) from accessing the supports they need.

Objectives:

The objective of this project is for researchers and museum educators to collaborate with autistic teens to create a set of UDL guidelines and training materials for informal learning environments that support belongingness for autistic learners. In Year 1, three museum sites across the US hired a cohort of 5-14 paid autistic teens to serve as codesigners. The codesigners examined existing engineering-design activities at each museum site, and provided feedback, redesigns, and suggestions to make the experience more inclusive. Combined with interview findings and discussion questions focused on learning differences and belonging, the codesign team created a set of suggestions for inclusive program design. In Year 2, these suggestions will be incorporated into activities in each museum site, which will undergo several testing and iteration cycles.

Methods:

Interviews with children and caregivers about museum experiences (n=12)

Interviews with codesigners about the belongingness in museums and ideas about activity design and UDL (n=24)

Museum staff reflections documented after each co-design session

Results:

Through family and codesigner interviews and reflections on the codesign process, we have identified preliminary themes needed to create a universally-designed informal learning experience.

- Make the environment easier to understand and embed intuitive wayfinding in each activity space
- Design activities where visitors have freedom to work at their own pace
- Be clear (but flexible) about learning goals
- Leverage and guide social interactions, allowing visitors to choose social and solo experiences
- Provide opportunities for independent exploration and choice
- Make goals and instructions more clear by breaking them down into steps and including visuals
- Embed visitor interest and encourage them to connect activities to personal experiences
- Provide multiple modalities for engaging with content
- Consider creative ways to display examples and celebrate visitor work
- Re-consider capacity and limit the amount of individuals at a workstation
- Provide time to increase familiarity with the space, activities, facilitation
- Provide smaller and intimate spaces with lighting that isn't too bright
- Be clear about who and how to ask for help

Conclusions:

While there are many challenges that prevent informal learning environments from being inclusive to autistic individuals, there is also a lot of flexibility and freedom in program design that doesn't exist in most formal learning environments. By utilizing findings created in collaboration with autistic youth and embedding UDL principles, informal learning environments can support belonging and learning for autistic museum visitors.

415.283 Addressing Social Skills and Anxiety in Autistic Adolescents: A Systematic Review of Interventions.

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Background: The prevalence of autism spectrum disorder (ASD) continues to rise in the U.S. (Maenner et al., 2021). Social skills deficits are a key characteristic of ASD, and autistic individuals also experience higher levels of anxiety compared to their neurotypical peers (Croen et al., 2015; Russel et al., 2016; Roux et al., 2017; Mazurek & Handen, 2019). Adolescence is a crucial period for developing social relationships, which can have long-term effects on individual outcomes (Shattuck et al., 2012). Autistic adolescents are at increased risk of bullying (Sterzing et al., 2012; Zablotsky et al., 2014), which is associated with elevated anxiety (Weiss et al., 2015). To address these issues, this systematic review will examine existing interventions that target both social skills and anxiety in adolescents with ASD. Prior research highlights the importance of addressing these areas, given the close relationship between mental health—particularly anxiety—and social skills performance in this population (Briot et al., 2020; Pickard et al., 2017; Factor et al., 2022; Fuselier et al., 2024).

Objectives: The aim of this systematic review is to synthesize evidence on the effectiveness of interventions that address both social skills and anxiety in adolescents with autism spectrum disorder (ASD) and to outline implications for practice.

Methods: A systematic search was conducted to identify peer-reviewed, English-language publications from 2013 to 2024. Inclusion criteria required participants to be adolescents (ages 10-19) diagnosed with autism spectrum disorder (ASD) or eligible for special education under Autism. The interventions needed to target both social skills and anxiety, with outcome measures reporting on both. Databases searched included ERIC, Academic Search Elite, Academic Search Premier, APA PsycArticles, APA PsycInfo, CINAHL, Education Full Text (H.W. Wilson), and MEDLINE. The initial search, conducted between July 22nd and August 2nd, 2024, yielded 1070 articles. After removing duplicates, 659 articles remained. Abstracts of these 659 articles were scanned, and 59 studies were selected for full-text review. Of these, 25 met the inclusion criteria. An ancestral search added six more articles, resulting in 31 articles included in the final analysis. A second observer coded 20% of the studies at each stage, with inter-observer agreement (IOA) ranging from 98% to 100%.

Results: The review synthesizes and describes key features of the interventions: intervention method, agent, tools, setting, duration, research methodology, and key findings. The studies included varied in methodology, intervention types, countries and represent a culturally diverse sample of participants. Out of the 31 studies included in the final analysis, the majority demonstrated a positive impact of interventions on both social skills and anxiety in autistic adolescents. However, fewer studies addressed the generalizability of the interventions, emphasizing the need for future research to explore this area more thoroughly.

Conclusions:

This systematic review highlights the potential of integrated interventions addressing both social skills and anxiety for autistic adolescents. While several interventions showed promise, there remains a need for more comprehensive and long-term studies to determine lasting outcomes.

415.284 An Exploratory Study into the Utility of Toca Boca's Creative Play Model for Autistic Children

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Background:

Autistic children often exhibit differences in social skill development and creative play compared to their typically developing peers. Technology-based interventions have been proposed as a potential way to address these developmental gaps. There are over 455,000 "educational" apps available in various app stores, but very few are properly evaluated for their effectiveness, particularly for autistic children. Ultimately, a well-designed app, informed by developmental science could offer significant benefits compared to other screen media by providing convenient, passive support for social skill development.

Toca Boca World (TBW), a creative play app with over 100 million downloads, has shown promise in promoting active learning, engagement, and social interaction, aligning with Meyer et al.'s (2021) four pillars of learning framework. However, few studies have examined its effectiveness in fostering social or creative play skills, particularly in autistic children. This study aims to explore the utility of TBW as a tool to support these skills in autistic youth.

Objectives:

The primary objective of this study is to determine whether participation in a TBW intervention improves social skills in autistic children aged 4-13. The secondary objective is to assess the participants' enjoyment of the app. A third objective is to explore improvements in creative play skills across the intervention sessions.

Methods:

We recruited 95 autistic children aged 4-13 and their primary caregivers. Pre- and post-intervention social skills were measured using the Social Skills Rating System (SSRS) and a Social Skills Observation form (via playground observations). The intervention consisted of eight TBW play sessions, each lasting 5-10 minutes over four weeks. Enjoyment after each session was measured using a five-point Likert-type scale, where higher ratings indicated greater enjoyment, comfort, and desire for future play. Paired samples t-tests were used to analyze pre/post changes in social skills and enjoyment.

Results:

Preliminary results from four children who have completed the intervention indicate significant improvements in overall social skills, particularly in cooperation ($t(3) = -4.33, p < .05$), assertion ($t(3) = -4.04, p < .05$), and self-control ($t(3) = -3.66, p < .05$), as measured by the SSRS. The children also consistently reported high levels of enjoyment during the sessions. They expressed happiness ($M = 4.34, SD = 0.77$), comfort ($M = 4.20, SD = 0.90$), and a strong desire to continue playing TBW ($M = 4.23, SD = 0.97$).

Conclusions:

Although data collection is ongoing, preliminary findings suggest that TBW may be a valuable tool for enhancing social skills in autistic children, particularly in cooperation, assertion, and self-control. If these trends hold as more participants complete the intervention, TBW could represent an effective, accessible means of supporting social development in this population. Moreover, the high levels of enjoyment reported by participants highlight the potential for sustained engagement, making it a promising tool for further research and potential use in developmental and educational settings. These findings have important implications for future work exploring TBW and its potential role in social skills development for autistic children.

415.285 An Implementation Process Evaluation of a Treatment Comparison Efficacy Trial: Establishing the Implementation Variable

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Background: Although RCTs are thought to be the gold standard in efficacy research of autism interventions, they may not tell the whole story. Increasingly in other fields (such as education science in the UK) researchers are using implementation process evaluations (IPEs) to understand the dynamic associations of factors affecting implementation of complex interventions in complex settings. IPEs, however, are used sparingly in autism intervention research. The current IPE study is being conducted in parallel with a multisite CRCT designed to assess the efficacy of two intervention programs [PEERS-focusing on social relationships and Unstruck and On Target (UoT)-focusing on executive functioning]. These programs were structurally similar (group based, similar number of lessons), which allowed them to serve as contact controls, but they addressed different high needs areas for autistic middle schoolers. This IPE began with the identification of research questions, which then lead to an initial conceptual map highlighting possible factors, or interactions of factors, possibly associated with implementation. To conduct such an analysis, however, one must establish the variable(s) that would constitute the implementation construct, which is the anchor of the IPE analysis. **Objectives:** To determine the key variable(s) that would represent the implementation construct in an IPE study of a CRCT intervention comparison.

Methods: To date, researchers have randomly assigned 12 schools to the PEERS condition and 9 schools to the UoT condition. Schools were located in Southern California and North Carolina, and 4-8 autistic students per school participated. Two primary implementation variables were examined. The first was the proportion of the intervention lessons completed by the end of the year (a content variable). The second variable was a quality rating from a scale consisting of 13 items in a 0-2 Likert-type format. On five occasions, intervention coaches completed the scale after observing implementer's lesson delivery, their mean rating was calculated, and the proportion high possible score (2.0) was calculated. Inter-rater agreement was conducted on more than 25% of the ratings with agreement about the 80% criterion. In addition, a composite score was calculated by multiplying the quantity X quality ratings.

Results: Table 1 lists the proportion of lessons covered, quality metric (the mean rating divided by 2.0 to establish a metric comparable to the content variable), and the implementation composite metric. The composite metric was then used to rank the schools on level of implementation. For UoT, a clear difference on the composite metric allowed ranking four schools as higher implementers and five schools as lower implementers. For PEERS the composite scores were more continuous so the top six schools were identified as higher implementers and the lower six schools were identified as lower implementers

Conclusions:

Establishing the implementation variable is an essential first step in conducting this IPE. It will now allow examination of process variables that could be associated with high and low implementation and similarities/differences between the two intervention programs. This is the next step in the full mixed-method IPE.

**415.286** Analysis of Effective Intervention Strategies within a Play-Based Intervention for Children with Developmental Disorders

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Background: Pretend play interventions hold preliminary efficacy for improving cognitive and affective skills in children with Prader-Willi Syndrome (PWS) and autism spectrum disorder (ASD; Dimitropoulos et al., 2021, 2023; Doernberg et al., 2021; Lifter, Mason, & Barton, 2011). However, it is unknown what components of these play-based interventions truly contribute to growth and development, as children with developmental disabilities respond differentially to various facilitation strategies, such as modeling, prompts, or praise. Previous studies have analyzed moment-to-moment interactions of children with developmental disabilities in response to adult facilitators, suggesting that adults who match the level of support needed provide effective care (Gordon et al., 2023; Hoffmann, 2016; Trawick-Smith & Dziurgot, 2011).

Objectives: As such, the present study uses a method of moment-to-moment analysis in which child and interventionist interactions were recorded, transcribed, and coded based on level of support and skills targeted.

Methods: Participants included 28 children ages 6-12 with PWS who completed a remotely delivered pretend play intervention for 6-8 weeks.

Participants demonstrated clinically significant impairments in social, cognitive, and adaptive skills, including overlapping ASD symptoms. Four sessions per child were transcribed and coded for type, level, and frequency of interventionist facilitation strategies (prompt, question, modeling, reflection/behavioral description, praise, or watching) and child play behaviors (pretend play, affect in play, imagination in play, and non-play).

Analyses of Variance (ANOVA) examined moment-to-moment responses of the child to the interventionist. Pearson's correlations and Hierarchical Linear Modeling (HLM) examined patterns of strategy and child target behaviors across the course of the intervention program.

Results: Findings supported the utility of the Interventionist-Child Dyadic Coding System and this method of analyzing moment-to-moment and between-session patterns of dyadic behavior. Results revealed that reflection and behavioral description (for example, commenting, "the girl is crying because she's sad," or "now he's driving the car"), and modeling strategies (such as, "this block can be the table"), most often preceded child's pretend play and may predict increases in these skills over time (75.74% and 75.03% of the time, respectively, $p < .01$). Prompts demonstrated mixed utility and were most effective when eliciting affect in play (50.82% of the time), while questioning was related to non-play ($p < .001$). Results did not vary for children with greater ASD symptomatology as indicated by the Social Communication Questionnaire.

Conclusions: This method represents a novel and efficacious mode of identifying how children respond to various adult intervention strategies, informing the mechanisms by which evidence-based interventions successfully scaffold child skill growth. The present study illuminates how non-directive strategies, such as modeling and reflection or behavioral description, may be essential facilitation techniques that help children with developmental disabilities improve their pretend play. Further, this method of analysis identifies how play and social cognitive skills may most effectively be scaffolded over the course of an intervention program. Future efforts to engage and support the PWS and ASD populations can be enhanced by capitalizing on these digital analysis methods and subsequently harnessing identified evidence-based techniques to refine interventions and provide more sensitive care.

415.287 Applying a User-Centered Approach to Inclusive Education Teacher Training: Teach Input from the U.S. and Netherlands
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Background:

Teachers globally receive insufficient training to teach autistic students in inclusive classrooms, leading to limited use of evidence-based practices for inclusion (EBI) and an inability to meet student needs. Teacher trainings to augment knowledge of autism and EBIs are essential and must be designed to align with teacher-reported needs to increase training engagement. Implementation science supports that trainings have a higher likelihood of changing behavior when stakeholders (i.e., teachers) participate in user-centered intervention design (Byrne, 2019; Pérez Jolles et al., 2022). As this is a global need, trainings developed with the input of international teachers can ensure cross-cultural feasibility and acceptability at the development stage.

Objectives:

To employ user-centered development of an intervention to globally support general education teachers, the current study sought teacher perspectives from the US and Netherlands on preferences for EBI content and training modalities.

Methods:

10 US and 17 Dutch current or preservice teachers completed a qualitative interview. Coded themes assessed inclusive teacher experiences and training needs/preferences. All participants also completed Likert questions (scale 0-10) assessing knowledge and attitudes toward *EBI training content* derived from the literature from multiple orientations and on different *instructional modalities* (e.g., decisional flow charts, vignettes, video modeling). Training preferences were ordered from most to least familiar (knowledge) and acceptable (attitudes) and were compared across the two countries.

Results:

Given several non-normal variables, a Wilcoxon Sign test was used to show the relative positioning of all 11 topics in terms of attitudes (M_{att}) and knowledge (M_k) compared to a neutral median Likert of 5. For EBI content, all teachers had negative opinions about self-regulation ($M_{att} = 4.67$; $M_k = 4.00$). The most preferred content included TEACCH strategies ($M_{att} = 7.67$; $M_k = 7.00$) and behavioral rewarding ($M_{att} = 7.67$; $M_k = 7.50$). In terms of modality preferences, teachers had low rankings for a behavioral flow chart ($M_{att} = 4.0$; $M_k = 3.50$) and motivational interviewing ($M_{att} = 4.67$; $M_k = 2.50$), and high rankings for diagnostic vignettes ($M_{att} = 7.67$; $M_k = 7.00$). Next, we compared mean attitude scores on the normally distributed variables between countries. Analyses revealed that Dutch teachers had more negative attitudes than US teachers on behaviorism $t = 1.77, p < .05$ and a behavioral flow chart $t = 1.72, p < .05$. Qualitative themes revealed most teachers had negative experiences with autistic students (22/27). This was higher among reporting US teachers. With equal distribution across countries, most teachers described using TEACCH strategies (22/27) and approximately half of teachers described using strategies consistent with NDBI (16/27), but very few had used peer interventions (3/27). Almost all teachers expressed the desire to learn more about autism (24/27) but less expressed the need to learn differentiated instructional strategies (12/27).

Conclusions:

Dutch and US teacher input about training content and modality preferences were closely aligned. However, data will be collected from additional countries (Malaysia & South Africa) to ensure we have international teacher opinions to shape the development of an EBI intervention that considers teachers needs and incorporates strategies identified as feasible and acceptable.



415.288 Are the Outcomes of PEERS for Adolescents Equivalent across Modality? an Examination of in-Person and Telehealth Intervention

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Background: During the Covid-19 pandemic, many healthcare services transitioned to telehealth, and some caregivers were concerned if telehealth services were efficacious (White et al., 2021). There is a growing body of literature supporting the effectiveness of in-person social skills interventions, however research on telehealth administration of social skills intervention is more limited. The research team associated with the PEERS® creators published data indicating similar social outcomes across treatment modality (Estabillo et al., 2022), and our research team published pilot data demonstrating similar social changes across telehealth groups (Adler et al., 2022). This study serves as the first independent replication of telehealth PEERS® to not only look at social changes across treatment modality but extend to the mental health and family impact.

Objectives: This study evaluated if the telehealth version of PEERS® has equivalent effects for autistic adolescents as the originally developed in-person modality. Change in social, familial, and emotional-behavioral factors over the course of intervention and across delivery method was analyzed via adolescent- and caregiver-reported measures. Additional factors not previously addressed in the literature, including intolerance of uncertainty and perceived treatment acceptability, were explored within telehealth groups.

Methods: 181 adolescents aged 11-17 ($M=13.49$, $SD=1.58$) and their families were included in the current analysis. Participants were enrolled based on documentation of autism diagnosis, $IQ \geq 70$, and other inclusion criteria (for full details, Schohl et al., 2014; Adler et al., 2022). Participants completed PEERS® for Adolescents via in-person or telehealth modalities ($n_{telehealth}=53$, $n_{in-person}=66$, $n_{waitlist}=62$). Questionnaires were completed by adolescents and their caregivers before and after PEERS® provision (Table 1 & 2). Using SPSS 28.0, 2x3 mixed model ANCOVAs, controlling for age, examined change across time (pre, post) and group (in-person, in-person waitlist, telehealth) for social (get-togethers, social knowledge and competency, social responsiveness, social problems), familial (environmental stress/disorder, parenting stress, parenting self-efficacy), and emotional-behavioral (anxiety, depression) factors. For telehealth only, paired samples t-tests examined intolerance of uncertainty change across intervention and descriptive statistics explored treatment acceptability.

Results: Findings indicated successful replication of positive improvements over the course of in-person and telehealth PEERS®, including get-togethers, social skills knowledge and competency, social responsiveness, social problems, parenting stress, and anxiety and depression symptoms; improvement in environmental stress/disorder was only observed in telehealth groups (Table 1). Furthermore, the changes in social skills knowledge, social competency, social responsiveness, get-togethers, social problems, and withdrawn/depressive symptoms were deemed statistically equivalent across modality, based on post hoc equivalency testing. Results examining only telehealth groups suggested improvements in caregiver-reported adolescent intolerance of uncertainty following PEERS® (Table 2), and families found telehealth PEERS® to be an acceptable intervention.

Conclusions: Overall, this study suggested that families will receive similar, if not equivalent, social, familial, and emotional-behavioral benefits from participating in either in-person or telehealth modalities of PEERS® for Adolescents. Additionally, caregivers reported a perceived improvement in adolescent intolerance of uncertainty following telehealth PEERS®. Importantly, families perceived the telehealth format of PEERS® to be acceptable. These findings may encourage healthcare providers to expand access to evidence-based intervention by offering telehealth services to the wider autism community.



415.289 Association between Improvements in Executive Functioning and Depression Among Autistic Adolescents Who Completed a Mindfulness-Based Intervention

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Background:

Many autistic adolescents experience challenges with executive functioning (EF) and mood symptoms (Camillone & Cragin, 2022). Mindfulness-based interventions (MBI) may yield improvements in both areas in autistic adults and non-ASD samples (e.g., Bockmann & Yu, 2023; Pagni et al., 2023), but less is known about autistic adolescents. Initial findings from our pilot randomized controlled trial (RCT) of a novel 8-week MBI for autistic teens and their parents demonstrated significant improvements in adolescent depression and a composite measure of EF in the treatment group (Matthews et al., under review). The current study examines treatment-related improvements in specific EF domains and potential associations among improvements in EF domains and depression. A better understanding of the relationship between improvements in EF and depression will provide insight into the mechanism by which these key areas may benefit from mindfulness training.

Objectives:

1. Compare change in EF domains between adolescents who completed an 8-week MBI and a delayed treatment control (DTC) group.
2. Examine associations among treatment-related improvements in EF domains and depression.

Methods:

Data were drawn from a pilot RCT of an 8-week telehealth MBI for autistic adolescents and their parents. Participants were 39 adolescent-parent dyads who were randomly assigned to the MBI ($n = 19$; adolescent M age = 15.32, 1.60; 68.4% male) or a DTC group ($n = 20$; adolescent M age = 15.10, $SD = 1.55$; 60% male) and completed data collection at both time points. Treatment group dyads attended weekly group meetings for 8 weeks to learn mindfulness and habit formation strategies. Participants were asked to practice mindfulness outside of group sessions using a mindfulness meditation app. Parents completed the Behavior Rating Inventory of Executive Function, Second Edition (BRIEF-2; Gioia et al., 2015) and the Children's Depression Inventory, Second Edition (CDI-2; Helsel & Matson, 2024) at baseline and program exit.

Results:

The treatment group demonstrated significant improvements on the BRIEF-2 inhibition ($t(37) = -2.71, p = .01$) and emotional control (Mann-Whitney: $z = 2.18, p = .03$) clinical scales relative to DTC. Group comparisons on the other clinical scales were not significant. Reported in Table 1, there were positive and statistically significant associations between improvements in inhibition and emotional control and improvements in depression in the treatment group.

Conclusions:

Findings suggest that treatment-related improvements in overall EF were driven by improvements in inhibition and emotional control. These findings are consistent with previous research in other populations indicating associations between mindfulness and inhibitory control (Pozuelos et al., 2019) and mindfulness and emotion regulation (Kral et al., 2018). Program strategies related to focused attention, acceptance of moment-to-moment experience, and the STOP (Stop, Take a breath, Observe, Proceed) Method likely facilitated these improvements. Improvements in inhibition and emotional control had moderate and strong associations, respectively, with improvements in depression in the treatment group. This suggests potential mechanisms by which mindfulness may improve mood symptoms in autistic adolescents. Future research with a larger sample size should examine whether improvements in inhibition and/or emotional control mediate improvement in depression symptoms or vice versa.



415.290 Autism Transition to Adulthood Groups (ATAG): Feasibility RCT of a New Peer-Group Intervention to Promote Successful Transition to Adulthood for Autistic Young People

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Background: Autistic individuals without intellectual disabilities often face barriers to positive adult outcomes and are at high risk for poor health, including mental health issues, which could be mitigated by improving well-being. Autistic individuals who receive a diagnosis of autism in childhood do not always receive formal support to learn about autism. Young people should receive support to increase their well-being during the transition to adulthood, when social and family support often reduces.

Objectives: We conducted a feasibility randomised controlled trial (RCT) of an online peer-group intervention, "Understanding You, Discovering You" (UYDY), which aimed to support autistic young people during the transition to adulthood.

Objectives included assessing (1) recruitment and retention rates; (2) the acceptability of randomisation and outcome measurement procedures; (3) Care as Usual (CAU) accessed by participants; (4) acceptability of the interventions; (5) clinical outcome measure variances.

Methods: This 2-arm parallel feasibility RCT included a nested qualitative evaluation. Seventy participants aged 16-25 years old with a clinical autism diagnosis were randomised on a 1:1 basis to UYDY or CAU. Exclusion criteria included risk of harm to self or others, receipt of post-diagnostic support in the past 12 months, and literacy levels such that the written session materials were not accessible. Participants were recruited from England and Wales via charities and NHS services.

UYDY, a six-week co-designed online peer-group intervention, covered topics such as understanding autism, problem-solving, and accessing services, and was facilitated by an autistic person and social care professionals. Clinical outcomes were measured at baseline, and 8-, 16-, and 24-weeks post-randomisation. The primary clinical outcome was well-being, assessed using the Warwick Edinburgh Mental Wellbeing Scale (WEMWBS). Secondary clinical outcomes included autism social identification, quality of life, social support, and loneliness. Adverse events were monitored and reported. Carer impact was also measured. Qualitative interviews were conducted to explore the acceptability of trial participation including randomisation and the interventions.

Results: A total of 314 potential participants expressed interest in the study, and 80 (25%) of these attended a baseline appointment, with 70 (22%) taking part. We therefore recruited the full target sample. Seventy-four percent of participants randomised to UYDY attended at least three of the six sessions. Initial qualitative interviews (n=19) indicated that participants generally had positive experiences of the UYDY groups. Two preliminary themes were (1) *a new perspective*; some participants felt their self-understanding improved through learning about autism, while others felt they benefitted by building useful practical skills such as problem solving. Theme (2), *collective support*, focused on positive experiences of being in a group with other autistic young people, and with autistic facilitators, and that this could improve well-being and self-acceptance.

Conclusions: Preliminary analyses indicate that a full trial of UYDY is feasible, and that the trial design is acceptable to participants. Data collection is ongoing and will be complete in early 2025. Results will inform the design of a full RCT.

415.291 Autistic-to-Autistic Peer Mentoring: Using Double Empathy to Foster Relationships, Self-Advocacy, and Identity Development

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Background: Recent studies report an increase in autism diagnoses among individuals aged 14 to 17, a crucial time for college preparation (Bakker et al., 2023). This trend highlights the urgent need for effective support systems to help autistic students transition to adulthood. Only 39% of autistic students complete a college degree within eight years of finishing high school, compared to 52.4% of their non-autistic peers (Newman et al., 2024). This gap emphasizes the unique challenges autistic students face in higher education. Peer mentoring is a promising approach to support autistic college students (Siew et al., 2017). With transitional programs and self-advocacy skills, autistic students can achieve similar success rates to non-autistic peers (Bublitz et al., 2015). The Double Empathy Theory (DET) suggests that communication difficulties between autistic and non-autistic individuals result from differences in perception (Milton, 2012). These challenges decrease when autistic individuals communicate with each other, improving information exchange (Crompton et al., 2020; Chen et al., 2021). Self-Determination Theory (SDT) emphasizes fostering autonomy, competence, and relatedness (Deci and Ryan, 1980). The Making Mentor program integrates DET and SDT to foster supportive, neurodiversity-affirming relationships. Autistic college students mentor autistic high school students. The program trains autistic college students, primarily STEAM majors, to mentor autistic high school students by sharing knowledge on self-advocacy and preparing for the transition to higher education. Mentors receive training from an autistic consultant on effective mentoring techniques and boundary setting.

Objectives: 1) Investigate self-advocacy outcomes within the context of the mentoring program. 2) Examine the experiences and perspectives of autistic participants using a mixed-methods approach.

Methods: This mixed-methods pre/post study included 6 autistic mentees and 10 autistic mentors from large urban universities and public schools; mentors and mentees were matched based on shared interests. Quantitative data were collected through surveys using the Self-Determination Inventory (SDI) (Shogren et al., 2017) for mentors/mentees and the Disability Identity Development Scale for mentors (DIDS, Forber-Pratt et al., 2022). Qualitative data were collected through interviews and analyzed using thematic analysis.

Results: Quantitative Analysis: Mentee Outcomes: The surveys revealed a large effect size in self-advocacy ("Advocate") ($d=0.82$), demonstrating a strong program impact. Moderate improvements were noted in "Strength" and "Interest" ($d=0.65$), while "Accommodations" showed modest gains ($d=0.38$). The combined effect size for Advocacy, Interest, and Strength was large ($d=0.91$), suggesting a meaningful impact despite the p-value not reaching significance. **Mentor Outcomes:** Mentor surveys showed slight improvements in "Interest" and "Strength" ($d=0.30$) but small declines in "Advocate" ($d=-0.25$) and "Accommodations" ($d=-0.27$), suggesting a decrease in self-advocacy and perception of accommodations. Improvement in the DIDS scores were noted. **Qualitative Analysis:** Four key themes emerged: (1) mutual understanding, (2) self-advocacy, (3) knowledge acquisition, and (4) self-identity (see Figure 1 for exemplars).

Community Engagement: The project includes autistic advisory board to guide program development and ensure content aligns with autistic needs and perspectives. Autistic mentors create resources and share their experiences at conferences, demonstrating meaningful community engagement.

Conclusions: The mentoring program demonstrated positive outcomes in self-advocacy and identity, with mentors and mentees benefiting from the program.



415.292 Behavior on Performance-Based Tasks of Pragmatic Language and Safety for Digital Romantic Encounters Is Related to Autism Features

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Background: A growing literature investigating the sexual health and romantic relationships of autistic adults, including the emergence of interventions in this domain, highlight the need for robust assessment. A previous study determined autistic adults have impaired pragmatic language skill compared to their counterparts and a lower number of partner experiences (Kohn 2022). To look further, we developed a novel set of performance-based tasks. These assessments include a pragmatic language task with text exchanges to potential intimate partners and a task assessing the safety of dating app profiles.

Objectives: To explore the relation between features of autism and performance on two novel assessments of performance in the context of romantic and sexual relationships.

Methods: To date, 77 adults (18 autistic) have completed the battery as part of an ongoing study. Groups did not differ in age or cognitive ability, although the non-autistic group had a higher proportion of women. All participants completed the Autism Quotient (AQ) to assess self-report of autistic features; scores were significantly higher for the autistic group ($M = 32.8$) than the non-autistic group ($M = 16.2$). Participants completed two novel tasks: (1) the Texting Pragmatics Task that assesses pragmatic language in the context of text exchanges with potential partners via 10 multiple choice and 10 free response items; and (2) the Trustworthiness Task assesses judgment about the safety of potential partners on 20 dating app profiles. We analyzed bi-variate correlations between the AQ and performance on the tasks to understand whether higher levels of autism features corresponded with different social behaviors.

Results: On the Texting Pragmatics Task, the AQ corresponded with performance on the free response items, $r(69) = -.27, p = .025$, but not the multiple choice items, $r(74) = -.08, p = .52$. Adults with higher levels of autism features demonstrated less effective pragmatic skills in the context of texting a partner when they were required to generate a free response but not when asked to select the best multiple-choice response. On the Trustworthiness Task, the AQ corresponded with safety ratings, $r(24) = -.46, p = .019$. Adults with higher levels of autism features rated the dating app profiles as being generally less trustworthy than adults with lower levels of autism features.

Conclusions: Two novel assessments of performance in the context of romantic and sexual relationships were sensitive to differences in the level of autism features, suggesting that the tasks may be useful in detecting individual differences that could be supported by dating and sexual health interventions for autistic adults. The tasks suggest that in the context of digital exchanges with romantic and sexual partners, adults who identify as having higher levels of autism features are less able to generate pragmatically effective responses to text exchanges and may be less trusting of potential partners. These differences provide useful information about the specific needs of autistic adults related to social aspects of intimate relationships and provide the possibility of more objective and inclusive assessments of these needs.

415.293 Building Connections: Peer-Mediated Instruction to Enhance Social Communication for Students with Autism in General Classrooms

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Background: For many individuals with autism, social impairment is one of the most challenging characteristics of their diagnosis. For school-students with autism in Australia, social impairments commonly limit the extent to which they participate in general education schools and classrooms. Due to the growth in the proportion of students with autism entering general education, it is becoming increasingly challenging for general educators to address the unique and diverse needs of the students in their care. Unfortunately, there remains a separation between empirical research and teacher practice, with many teachers finding it difficult to sacrifice class time for social and emotional interventions.

Objectives: Primarily, this study aimed to determine the effect of peer-mediated time-delay instruction, embedded within typical academic learning tasks, as support for the social communication development of students with autism. In addition, this study aimed to investigate other potential impacts as a result of the peer-mediated intervention, including impacts on academic progress and their general enjoyment of the intervention.

Methods: Three single-case designs, each involving a multiple-baseline-across-behaviours design for a target participant with autism, were used to investigate the effect of the peer-mediated intervention on both the frequency and quality of targeted social communication behaviours. The peer-mediated time-delay instruction was embedded by same-age peers without disability during teacher-led learning sessions. Partial-interval recording procedures were used to collect observational data. Visual data analysis and IQR_Md quantification processes were used to analyse observational data of the target students. A fidelity checklist was used to monitor the intervention's implementation by peers throughout this investigation.

Results: Data show that the intervention had some positive effects on several of the social communication behaviours targeted during the study. However, due to small-scale intervention effects, variable data patterns, and inconsistent effect replication, a functional relationship between the intervention and the targeted social communication behaviours could not always be established. Implementation fidelity data demonstrated that trained peers accurately delivered the intervention, with an increase in accuracy over time. Academic monitoring showed that there was no regression in academic outcomes for any participating student. At the completion of the intervention, participants' self-reports revealed that their experience was positive, resulting in improved social communication skills and confidence.

Conclusions: In conclusion, the peer-mediated intervention demonstrated some positive effects on social communication behaviours among students with autism. The fidelity of implementation by trained peers improved over time, and no adverse effects on academic outcomes were observed for any participants. Additionally, the intervention was positively received by both students with autism and their peers, suggesting that integrating social communication strategies into academic learning can offer meaningful social benefits without compromising academic progress.

415.294 Capturing Autistic Students' Anxiety: Application of the PARS-ASD in a School-Based Comparative Effectiveness Trial.

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Background: Anxiety is common in autistic children (Salazar et al., 2015) and may negatively impact school functioning (Reyes et al., 2021). The SCARED (Birmaher et al., 1999) is often used to measure anxiety in school-aged children, including autistic youth (Stern et al. 2014) but was not designed specifically for autistic youth. The recently developed PARS-ASD (Maddox et al., 2020) is a brief caregiver interview designed to assess anxiety in autistic children that may be both useful and feasible in research contexts compared with lengthier semi-structured interviews (e.g., ADIS-ASA; Kerns et al. 2014) or objective measures alone. This study explores the application of the PARS-ASD in a school-based comparative effectiveness trial.

Objectives:

- 1) Examine the feasibility and utility of the PARS-ASD with autistic students.
- 2) Examine relations between the PARS-ASD and teacher (SAS; Lyneham et al., 2008), caregiver (SCARED), and child (SCARED) rating scales. It was hypothesized that the PARS-ASD would be (1) feasible due to its brevity and will have good utility, given the autism-specific items and range of anxiety symptoms assessed; and (2) positively correlated with the caregiver SCARED, but not correlated with reports from other informants.

Methods: Participants were 127 autistic children with anxiety aged 8-15 years ($M=10.9$, $SD=1.7$), their caregivers, and teachers. Participants were diverse across gender and racial and ethnic identities (see Table 1). Participants were recruited through an ongoing multi-site, cluster randomized comparative effectiveness trial examining Zones of Regulation (Kuyper, 2011) and Facing Your Fears in School (Reaven & Blakeley-Smith, 2024) for autistic students. Caregiver, teacher, and child report measures of anxiety were collected at baseline. For Aim 1, PARS-ASD subscale endorsements, administration time, and anxiety domains measures across instruments were obtained. For Aim 2, correlations of total scores for each measure were conducted.

Results: PARS-ASD mean administration time was 24 minutes, 13 seconds ($SD=7:38$) and 91% of participants completed the PARS-ASD at baseline. The administration time paired with unique anxiety symptom domains promotes the utility of the PARS-ASD. Descriptives in this school-based sample ($M=11.3$; $SD=5.5$) were very similar to clinical samples (Maddox et al., 2020). See Table 2 for PARS-ASD, SCARED, and SAS administration modality, measured anxiety constructs, and sample items. Of the anxiety domains unique to the PARS-ASD, 75.6% of caregivers endorsed specific phobia(s), 52.8% endorsed anxiety symptom(s) related to health and the body, and 88.2% endorsed anxiety surrounding need for sameness/routine. Bivariate Pearson correlations revealed that the PARS-ASD total score was significantly correlated with caregiver SCARED Total Score ($r=.61$, $p<.001$), but not child SCARED or teacher SAS (Table 3).

Conclusions: Results suggested that the PARS-ASD is time efficient, had a high completion rate in this trial, and captures anxiety symptom domains not assessed by some other common measures (Specific Phobia(s), Health and the Body, and Sameness/Need for Routine). The PARS-ASD was only significantly correlated with the caregiver SCARED measure, though the caregiver SCARED was significantly correlated with all other measures. These results highlight the potential unique benefits of PARS-ASD utilization within school-based anxiety research. Limitations and future directions will be discussed.



415.295 Caregiver Perspectives on an Adapted CBT Intervention for Autistic Adolescents with Intellectual Developmental Disability: Facing Your Fears-IDD

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Background: Autistic adolescents with intellectual developmental disability (IDD) are an underserved population at high risk for anxiety. However, they tend to have limited treatment options (Skwerer et al., 2019), and they are frequently excluded from treatment trials (Rosen, Connell, & Kerns, 2016). Adapting Cognitive Behavior Therapy (CBT) approaches for the full spectrum of autistic youth reflects a key step in enhancing mental health treatment options. Caregivers' perspectives may inform what CBT components are most and least effective and what adaptations and refinement are needed for this population.

Objectives: Caregivers were interviewed to gauge information about their experiences after participating in Randomized Controlled Trial (Facing Your Fears: Intellectual Developmental Disability (FYF:IDD, Blakeley-Smith et al., under review). FYF:IDD is a CBT based intervention designed to address anxiety symptoms in autistic youth with IDD. Thus, this qualitative investigation aimed to understand caregiver perceptions of a CBT based group intervention.

Methods: One family per FYF:IDD group ($n=16$ families; 21.9% of sample) was randomly selected to participate in a 30 minute "Exit interview" 6 months after completing FYF:IDD. This semi-structured exit interview was conducted with caregivers to examine their perceptions about FYF:IDD, including aspects such as CBT components, caregiver involvement, and treatment modality. Exit interview questions were developed in line with other treatment adaptations (e.g., Reaven et al., 2023). Interviews were recorded and transcribed. Transcripts were analyzed using rapid qualitative analysis to determine themes about perceptions of FYF:IDD.

Results: Analyses yielded four overarching themes: (1) "*Intervention required practice beyond group sessions*" - Caregivers reported that after participating in FYF:IDD, they needed practice outside group to increase teens' use of the strategies learned. (2) "*Importance of individualizing strategies*" - Caregivers stated that FYF:IDD needed to individualize strategies for their teens. (3) "*Caregiver involvement to enhance accessibility and generalization*" - Caregivers mentioned that they often needed to be highly involved to increase accessibility and generalization. (4) "*Weighing the pros and cons of a group modality*" - Caregivers reported benefits and challenges of a group modality for them and their teens.

Conclusions: When trying to expand evidence-based anxiety interventions to support autistic teens with IDD and their families, it is critical to understand caregiver perspectives of the intervention. Results from this study suggest that when using CBT approaches, repetition and long-term practice of skills is pivotal, adaptations of CBT strategies may be needed to match the unique needs of each teen, caregiver involvement is necessary, and group modality may be the best fit for some families, but not others. In the future, thoughtful tailoring of both CBT strategies and group constellation is necessary for families to experience belonging and to support accessibility and generalization of treatment components. This study reflects an important step in further adaptations and refinement of FYF:IDD. Future directions and recommendations will be discussed.

415.296 Changes in Heart Rate Variability in Autistic Youth Following a Therapeutic Photography Intervention

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Background: Research indicates that autistic youth are disproportionately impacted by a lack of access to evidence-based supports while also experiencing many health conditions and social challenges. These challenges can also be compounded by intersecting identities that can place an individual at even greater risk of marginalization (e.g., identifying as LGBTQ2S). Consultations with the autistic community reveal a desire to prioritize research and supports that focus on mental health. Within this context, we evaluated the potential of an easily-implemented intervention for autistic youth, therapeutic photography (TP) to improve well-being.

Objectives: To determine if autistic youth (age 16-25 years) show differences in their physiological experience of well-being after participating in a therapeutic photography intervention.

Methods: Forty-one autistic youth were recruited from a variety of sources including community organizations, online advertising, and social media. Thirty-four participants visited the lab before and after completing the 4-week TP intervention, where they took photographs of contexts that were associated with happiness, connectedness, optimism, and engagement/perseverance and completed the physiological measurement. Gender identity varied considerably, with 57% identifying as cis-gender and 43% as gender diverse (i.e., transgender, non-binary, agender, and genderqueer). Well-being was measured through vagal tone as operationalized by heart rate variability (HRV). During lab visits, HRV was measured at rest and during mild stress (i.e., a computerized version of the Mirror Tracing Task) using electrocardiogram data collected via electrodes placed on participants wrists and ankle. HRV was operationalized using the root mean square of successive differences (RMSSD) of the intervals between heartbeats.

Results: In the overall sample, there was no significant change in baseline HRV before and after the intervention ($p = .45$). When change in baseline HRV was examined by gender group, cis-gender participants showed no significant difference ($p = .78$), while participants who did not identify as cis-gender showed an increase in baseline HRV after the intervention that approached significance ($p = .05$).

Conclusions: Results may suggest that gender identity had an important association with how responsive participants were to the intervention at a physiological level, and also may have different resting state HRV in general. Potential interpretations of the results and implications for informing interventions and supports for autistic youth will be discussed. It is important to consider gender differences beyond looking at cis-male and cis-female distinctions when considering gender in autistic research.

415.297 Changes of Brain Connectivity after Social Skills Training in Autistic Adults

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Background: Autistic adults suffered from social communication difficulties. Evidence-based social skills training may significantly improve social function impairment, reduce social interaction anxiety, stimulate motivation for social interaction, and acquire social skills knowledge. Whether the social skills training change the structural connectivity of the brain is largely unknown.

Objectives: This study aims to investigate the changes of white matter integrity by diffusion tensor imaging (DSI) after social skills training in autistic adults.

Methods: This study recruited 28 autistic adults, who completed 16-week The Program for the Education and Enrichment of Relational Skills® social skills training. DSI images was collected before and after the training in each participant. Repeated measure analysis of variance was performed to compare the DSI parameters (including generalized fractional anisotropy [GFA], fractional anisotropy [FA], radial diffusivity [RD], axial diffusivity [AD] and mean diffusivity [MD]) before and after the training.

Results: Preliminary analysis revealed that the DSI parameters of several tracts may change after the training, including left thalamic radiation of ventrolateral prefrontal cortex (GFA), right thalamic radiation of dorsolateral prefrontal cortex (AD), and right perpendicular fasciculus (AD and MD). However, most findings did not pass multiple test comparison. Of note, several non-gaussianity parameters changed after the social skills training. The statistical power may be limited by smaller sample size.

Conclusions: Preliminary findings revealed that social skills training may change white matter integrity in autistic adults. However, most findings did not survive multiple test correction. These initial findings warrant further investigation by novel methods. Besides, other brain structural parameters such as cortical/subcortical volumes may be worth investigation.

415.299 Community-Partnered Development and Feasibility Testing of a Brief Motivational Interviewing Intervention to Support Autistic Young Adults with Motivation to Complete Daily Living Skills

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Background: Many autistic adults demonstrate a notable gap between their cognitive skills and consistent completion of daily living skills (DLS) needed to live independently. (Kraepel et al., 2017). Under-developed DLS may arise from problems with either *capacity* (skill acquisition) or *consistency* (skill execution). Diminished motivation to complete DLS may drive poor consistency, but no existing DLS treatments for autistic young adults addresses DLS consistency. Motivational Interviewing (MI) is an evidenced-based therapeutic style that honors autonomy and personal values and aims to promote behavior change. MI has been used successfully to promote change across a range of health behaviors in young adults (Cushing et al., 2014). Thus, MI is a theoretical framework that may be well suited to support autistic young adults with their DLS consistency.

Objectives: 1) Use a community-partnered research approach to develop an MI-based intervention for improving consistency with DLS; 2) Assess feasibility and acceptability of the new intervention

Methods: We developed a 5-session intervention, Motivational Interviewing for Daily Living Skills (MI-DLS) based on a brief motivational enhancement therapy for alcohol abuse program (Miller et al., 1999). Core tenets of MI-DLS include exercises to identify values, explore ambivalence about change, and provide autonomy support around DLS selection and execution. We then conducted individual semi-structured interviews with an advisory board of nine transition-age autistic youth, caregivers, and service providers to garner feedback content, and the perceived utility and accessibility of the intervention. Advisor feedback was integrated into a revised treatment manual. We piloted MI-DLS with 10 autistic young adults (17-21 years) to evaluate its acceptability and satisfaction. Acceptability was measured through session attendance. Satisfaction was rated on a 1 to 7 scale through self-report and caregiver-report.

Results: Manual Development – Community consultants requested revisions related to: (1) addressing sensory and executive functioning challenges that influence motivation to conduct DLS, (2) clarifying ambiguous language, (3) ensuring that autistic young adults are present in the room for all conversations with caregivers. These revisions were integrated into the MI-DLS manual. **Feasibility**– 10/10 participants completed all five MI-DLS sessions. Participants took an average of 5.9 weeks to complete the 5 sessions due to participant scheduling conflicts. **Acceptability** – Across sessions, autistic youth (N=10) and caregivers (N=7) reported high levels of satisfaction and perceived helpfulness. Both autistic youth and caregivers also reported high likelihood of consistently using MI-DLS strategies to complete their target DLS as well as other DLS (see Table 1 for all ratings). Autistic youth additionally reported high levels of empowerment in sessions.

Conclusions: To our knowledge, our study is the first to employ an intervention rooted in MI principles for autistic people. Community-partners optimized the utility and accessibility of our intervention by identifying the need for accommodations for executive function and to minimize sensory discomfort. Preliminary data suggests MI-DLS is feasible with high levels of acceptability and satisfaction. Future research will pilot MI-DLS in a larger sample to evaluate preliminary treatment efficacy.



415.300 Comparing Sensitivity of Social Communication Measures Following a Trial of PRT

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Background:

Pivotal Response Treatment (PRT) is an evidence-based behavioral intervention aimed to improve social communication skills in autistic children. While social skills may improve with intervention, quantifying these changes may be challenging due to limitations in existing assessment tools (Bishop et al., 2019). The Vineland Adaptive Behavior Scales, Third Edition (Vineland-3) and the Social Responsiveness Scale, Second Edition (SRS-2) are widely used standardized parent-report questionnaires for assessing social communication improvements. Although the validity and reliability of these measures have been studied, there is continued need to evaluate their sensitivity in detecting changes in social communication skills following PRT.

Objectives:

This study aimed to compare the sensitivity of the Vineland-3 and SRS-2 in detecting change in social communication skills following a trial of PRT.

Methods:

This study included 51 children aged 4-9 years old with an ASD diagnosis confirmed by the ADOS. Families participated in a 16-week trial of PRT. Sessions were 6 hours weekly and consisted of direct work with the child and parent guidance. Parents completed the Vineland-3 and SRS-2 at baseline and at the end of treatment.

Results:

Following PRT, improvements were seen in Vineland-3 domain standard scores (Communication: $p = 0.004$, $t(39) = -3.039$; Socialization: $p = 0.006$, $t(39) = -2.889$) and subdomain age equivalents (Receptive Communication: $p = 0.028$, $t(39) = -2.278$; Play and Leisure: $p < 0.001$, $t(39) = -5.271$). Improvements were also seen in SRS-2 domain raw scores (Awareness: $p = 0.005$, $t(48) = 2.979$; Cognition: $p = 0.032$, $t(48) = 2.214$, Communication: $p < 0.001$, $t(48) = 4.198$; Motivation: $p = 0.029$, $t(48) = 2.248$), and T-scores (Communication: $p < 0.001$, $t(48) = 5.464$, Motivation: $p = 0.001$, $t(48) = 3.408$). There were no differences observed between changes in Vineland-3 standard scores and SRS-2 T-scores. The magnitude of change in Vineland-3 age equivalent scores across social communicative subdomains (Receptive Communication, Expressive Communication, Interpersonal Relationships, Play and Leisure) were greater than the changes observed in SRS-2 raw domain scores (Social Awareness, Social Communication, Social Cognition, Social Motivation), $p < 0.001$.

Conclusions:

The Vineland-3 and SRS-2 both measured improvements in social communication skills of autistic children following a trial of PRT. Change was detected across Vineland-3 domain raw scores and subdomain age equivalent scores as well as SRS-2 raw domain scores and T-scores. The Vineland-3 age equivalent scores demonstrated the greatest magnitude of change. This provides evidence that the Vineland-3 age equivalent scores may be of increased sensitivity to change. This could be due to how the Vineland-3 is a clinician administered interview, where the clinician is able to probe for changes even of small magnitude. Overall, although the greatest magnitude of change was detected in the Vineland-3 age equivalent scores, the Vineland-3 standard scores and SRS-2 domain-level raw and T-Scores also detected change in this sample. It is critical to continue investigating outcome measures such as the SRS-2 and Vineland-3 to further refine outcomes and determine which are the most fit for a given trial.

415.301 Concept Structuring Analyzing Task (ConSAT) - a Methodological New Tool for Revealing Interviewees' Perceptions about Educational Inclusion of Students with ASD

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Background:

All over the world, educational inclusion has become an established philosophy and a common placement practice for students with ASD in elementary schools. While the philosophy of inclusion is advanced by clinicians, parents and educators, very little is known about the implementation of its principles by educational teams who take part in this complex process. Previous studies used questionnaires and interviews with direct questions on the subject. In the present study the ConSAT methodology was utilized for the investigation of interviewees' perceptions about the inclusion of students with ASD in their classrooms, and how they perceive their roles in it.

Objectives:

To explore the perceptions of various educational team members: 1) school principals, 2) teachers and 3) paraprofessional aids about their role in the inclusion process in which they take part.

Methods:

39 educational educators: 10 school principals, 11 teachers and 18 paraprofessional aids, participated in the study. ConSAT interviews were conducted with each of them. Each participant was asked to create a visual map that represents its ideas about the inclusion of students with ASD in regular classrooms. In addition, each participant was asked to define 19 concepts that appeared in their own map (attached an example of one map)

Results:

Findings revealed that the school principals, the teachers and the paraprofessional aids did not share views on the inclusion process, and their respective tasks. Differences were identified with respect to the role of the included student, the relationships among the educational team members, and the functions of the paraprofessional aides. Our results shed light on how the educational teams defined all the stakeholders that are involved in the inclusion process, and how they viewed the various activities that are required for the inclusion to succeed.

Conclusions:

1. The ConSAT methodology significantly advance our understanding of the complexity of the inclusion process
2. This is a useful methodology for capturing interviewees' perceptions about inclusion without leaning on direct questioning.
3. Our results point to the need to define the distribution of responsibilities within the school and ensure that the philosophy of inclusion is familiar and shared by those who take part in it.
4. We suggest to expand the training programs of educational teams to include theory and practice about successful inclusion of students with ASD in regular school systems.



415.302 Coping with Uncertainty in Everyday Situations (CUES©): The First U.S. Trial

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Background: Approximately 40% of autistic youth are diagnosed with at least one DSM-5 anxiety disorder (van Steensel et al., 2011). The presence of anxiety often amplifies the social and functional difficulties faced by autistic youth, exacerbating poor outcomes. Intolerance of uncertainty (IU) has been identified as a key mechanism to the development and maintenance of anxiety in both neurotypical and autistic populations (Jenkinson et al., 2020; Osmanağaoğlu et al., 2018). Of note, autistic youth demonstrate higher rates of IU compared to their neurotypical counterparts (Boulter et al., 2014; Chamberlain et al., 2013; Neil et al., 2016). As such, autistic youth who experience anxiety may benefit from interventions that specifically target IU. Coping with Uncertainty in Everyday Situations (CUES©; Rodgers et al., 2017) is the first intervention for autistic youth that treats anxiety via IU. Preliminary data show decreased child IU and anxiety as well as increased parental self-efficacy following participation in CUES© (Rodgers et al., 2022). However, these data have yet to be replicated. Further, CUES© has yet to be implemented in the U.S.

Objectives: The objective of the present study is to (1) implement minor content adaptations while still maintaining the integrity of the CUES© treatment, (2) assess whether U.S. families find CUES© to be an acceptable intervention, and (3) determine whether treatment outcomes from the CUES© origin site can be replicated in the U.S.

Methods: The CUES© parent-facing didactic content was adapted for U.S. populations through group consensus with a certified CUES© provider. Three groups with approximately 8 participants each will take place: one in the fall of 2024 and two in the spring of 2025. Assessment measures will be used at baseline to confirm autism diagnoses (BOSA; Lord et al., 2020), evaluate cognitive function (KBIT-2, Revised; Kaufman & Kaufman, 2022), and screen for comorbid anxiety (ADIS-ASD; Kerns et al., 2024). Outcome measures will be implemented pre- and post-treatment to examine changes in parent-reported IU (IUS-P; Comer et al., 2009) and parent-reported anxiety (ASC-ASD; Rodgers et al., 2016). Intervention acceptability will be assessed post-treatment (CEQ; Devilly & Borkovec, 2000).

Results: Adaptations ($N = 164$) primarily addressed differences in phrasing (51.23%) as well as differences in spelling (26.83%) between British English and American English. For example, changing "Why not have a go" to "Give it a try" or "Mum" to "Mom". Images were also changed to better match the racial-ethnic demographics of the midsized midwestern city where groups will be held. The first CUES© cohort is currently underway, which includes the parents of 8 autistic children and adolescents aged 7-17 ($M = 12.13$; 87.5% male). On the ADIS-ASD, 40% met criteria for 2-3 clinical modules and 40% met criteria for 4 or more clinical modules.

Conclusions: Complete pre- and post-treatment data for the IUS and ASC-ASD will be available for approximately 24 participants at conference time along with data for the CEQ. Analyses and descriptives will indicate whether U.S. families find the intervention to be acceptable and whether it had an impact on parent-reported IU or anxiety.

415.303 Correlates of Attrition Status in a 12-Week Non-Inferiority Trial Comparing Telehealth Versus in-Person Parent-Mediated Intervention for Autistic Toddlers

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Background:

Randomized controlled trials offer families of autistic children free access to evidence-based interventions, which have been associated with improved outcomes. However, dropout occurs, particularly for low-income populations (Carr & Lord, 2016). In an ongoing federally-funded autism early intervention clinical trial providing in-home parent coaching for 12 weeks, we have observed unexpectedly high attrition. The trial's design, where all families receive the intervention, allows us to examine a myriad of factors associated with attrition. Identifying these correlates may help inform the development of family-centered supports to maximize participation, and ultimately, child outcomes.

Objectives:

To define associations among child-, parent-, and family-level factors and attrition status in an ongoing non-inferiority trial comparing a telehealth versus in-person parent-mediated intervention for autistic toddlers.

Methods:

Participants included 113 autistic toddler-parent dyads (autistic toddler age range: 24–36 months; male: 93, 71.5%; female: 37, 28.5%). At baseline, parents completed family and child questionnaires, and research-reliable examiners conducted Autism Diagnostic Observation Schedule (ADOS) and Mullen Scales of Early Learning assessments. Participants were categorized into one of four attrition status groups: attended no intervention sessions ($n = 15$), attrition after 1-2 sessions ($n = 17$), attrition after 3+ sessions ($n = 17$), or no attrition (completed intervention) ($n = 64$). Chi-square tests assessed associations between attrition and categorical variables (e.g., intervention modality, sex assigned at birth, race, family income, mother/father education, mother/father work status, child co-residence with mother/father), while ANOVAs examined differences in continuous variables (e.g., Mullen and ADOS scores, parent motivation, child behavior).

Results: Attrition was significantly associated with intervention modality ($p = 0.012$), with higher attrition rates observed prior to intervention onset in the telehealth (66.7%) compared to the in-person intervention arm. Reasons for attrition varied by attrition status ($p = 0.002$): families citing obstacles/life stressors were more likely to attrit after 1-2 sessions (58.8%) or 3+ sessions (47.1%), while families with attrition before completing any sessions were mostly passive (66.7%), providing no reason for leaving the study. Family income ($p = 0.004$), father's education ($p = 0.013$), and child co-residence with father ($p = 0.034$) were significant correlates of attrition status, with lower income and lower father education, and child not co-residing with father being associated with higher attrition. Parents in the completion group had greater coach-coded motivation compared to attrition groups ($p < 0.001$). While ADOS CSS and Mullen scores showed no group differences, children with attrition without receiving any sessions exhibited more repetitive behaviors ($p = 0.035$).

Conclusions:

These findings highlight the need to tailor supports, particularly for telehealth interventions, and to consider family dynamics and socioeconomic context to reduce attrition. Despite significant correlates, child-level factors (ADOS, Mullen) scores were not significantly associated with attrition status, suggesting that family-level factors may play a more substantial role in trial participation. Providing targeted engagement strategies for low-resourced families may support retention and child intervention access in similar trials.

415.304 Development and Evaluation of a Training Course Using Embodied Virtual Reality for University Staff to Make Universities More Inclusive for Autistic Students

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Background: University education is a crucial means for autistic adults to achieve social participation. However, France lags behind in the education of autistic adults, even though it is a national priority. Evidence from the literature has shown the positive effect of specialized training on teachers' attitudes toward the inclusion of students with disabilities. However, it also points to the need for practices that emphasize experimentation. It has also been shown that embodied virtual reality (EVR) is a more effective method of eliciting awareness than traditional perspective-taking.

Objectives: We have developed a training course in autism for university teachers and staff, combining a classic learning environment with theoretical presentations and a learning environment using EVR, and we propose to test its effects in terms of improving awareness, via pre/post-test and comparison conditions protocols. To meet this objective, our project includes 3 studies. This paper will present the results of study 1 and the methodology of studies 2 and 3.

Methods: The methodology is based on the ORBIT model of intervention development and evaluation (Czajkowski et al., 2015). The first study aims to develop the training course. To identify the needs of university teachers and staff and define the content of the training course, individual research interviews with 15 autistic student-experts enrolled in 5 French universities, and 26 university teachers and disability service staff from 14 universities, have been carried out. Collaborative workshops to produce EVR content were planned with autistic students (they took part in creating the scenarios and were actors in the films). The second and third studies aim to test its impact. Study 2 aims to conduct a preliminary evaluation via a pilot study using a pre/post-test protocol on 30 participants. The protocol will include different evaluations: self-reported questionnaires (knowledge about autism and inclusive practices, beliefs and attitudes towards autism and school inclusion, empathy, and social desirability), implicit association testing (measuring implicit bias), problem-solving exercises regarding academic inclusion, and research interviews (exploring satisfaction with the training course format and content). Fidelity implementation will also be assessed. Study 3 is a randomized controlled trial on a larger population. The protocol will be the same as that of the pilot study but will include two comparison conditions.

Results: The results of the interviews highlighted the various difficulties encountered by French autistic students, particularly in their interactions with university staff, as well as the need for support for professionals, particularly due to their lack of resources and training. Three 360-degree EVR film prototypes have been first produced, in collaboration with 12 autistic students, confirming technical feasibility. A first version of the theoretical training content (manual and PowerPoint) has been produced and validated by the experts (autistic students and professionals). The scenarios have also been co-constructed and reviewed with the experts. Participative and collaborative workshops for producing EVR content (shooting 360-degree EVR films) were done with neurotypic students and autistic student.

Conclusions: The effects of this project are both scientific and societal, and address issues of inclusion and digital innovation in university training.

415.305 Do Autism and ADHD Play a Role in Teachers' Burnout in France?

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Background: The teaching profession is particularly vulnerable to stress and burnout, with over 50% of teachers in France reporting these issues. Burnout manifests through emotional exhaustion, depersonalization, and reduced personal accomplishment. Various factors contribute to its development, as explained by Bruchon-Schweitzer and Boujut's transactional and integrative model, which emphasizes the interplay of personal antecedents, dispositional variables, and transactional processes between the individual and their environment. Understanding these interactions is crucial, especially as burnout often arises when teachers perceive stress without adequate coping mechanisms. The factors influencing teacher burnout can be classified into four categories: socio-demographic factors, aspects of the professional and organizational environment, personal characteristics of the teacher, and student-related factors. Understanding the dynamics that affect teachers' well-being is essential, as it directly impacts student welfare. In France, the school enrollment rate for children with neurodevelopmental disorders has risen due to legislation aimed at promoting inclusion. This requires teachers to adapt their methods for students with special needs, potentially increasing their stress and risk of burnout.

Objectives: The study aimed to 1) assess the risk of burnout among mainstream teachers in France and 2) identify predictors of burnout in these teachers. The investigation focused on variables such as teachers' socio-demographic characteristics, work context, individual psychological variables and the characteristics of their students, particularly emphasizing the presence of at least one pupil with autism or with attention deficit hyperactivity disorder (ADHD).

Methods: A sample of 347 French mainstream teachers took part in the study: 214 teachers without students with disabilities, 69 with at least one student with autism, and 64 with at least one student with ADHD. Participants completed a questionnaire that included standardized scales (assessing perceived stress, generalized self-efficacy, perceived social support, coping strategies and burnout) along with questions about their socio-demographic characteristics and working conditions. Multiple linear regressions were conducted to analyze the predictive effects of socio-demographic characteristics, dimensions of perceived stress, generalized self-efficacy, dimensions of perceived social support and coping strategies on each of the three burnout dimensions.

Results: The results indicated a high prevalence of burnout among all teachers (whether or not they have a student with autism or ADHD), with 46.4% of the total sample displaying at least one dimension of high burnout. Negative predictors identified included perceived stress as a threat, low self-efficacy, low perceived social support, emotion-focused coping strategies, being female, having low seniority, and teaching in primary education. Notably, having a student with autism or ADHD did not emerge as a predictor of teacher burnout; rather, it served as a protective factor for those with ADHD.

Conclusions: The findings underscore the urgent need for public policy interventions to address teacher burnout in France. Our findings suggest that neither student's autism nor student's ADHD were predictors of burnout among French teachers, highlighting the success of inclusion policies in France. Nevertheless, these results put in light the need for better support in stress management and social support strategies to address the high overall prevalence of burnout among teachers working with students with special needs.

415.306 Does Formal Training Matter? How Training in Manualized Programs Impact Interdisciplinary School Provider Attitudes Toward Evidence-Based Practice

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Background: Anxiety is common in autistic students and disrupts daily and school functioning (Adams et al., 2019). Schools may be the ideal setting for addressing anxiety and emotion dysregulation in students (Zablotsky et al., 2015). While there are commercially available school-based manualized programs for anxiety, it is unclear whether providers receive formal training in these interventions and/or how much they are implemented. Lack of training may limit program delivery and reduce intervention fidelity, negatively impacting student outcomes (Kern et al., 2017). There is some evidence that provider attitudes play a critical role in training participation and EBP use (e.g., Locke et al., 2019) and may lead to better implementation and delivery (Barnett et al., 2018); however, it is unclear how these factors impact EBP use within the context of school mental health services for autistic youth.

Objectives: (1): To understand whether interdisciplinary school providers (ISPs; e.g., counselors, special educators) receive formal training in manualized programs for anxiety and emotion dysregulation and assess the frequency of specific program usage. It is hypothesized that most ISPs will not have received formal training in manualized programs, but may still have high rates of use. (2): To understand whether provider attitudes toward EBPs relate to their training in and use of manualized programs. We hypothesize that having formal training in any program will be related to more favorable attitudes toward EBPs overall.

Methods: Elementary and middle school ISPs (N=129) were enrolled in an ongoing cluster, randomized comparative effectiveness trial of two school-based anxiety interventions, *Zones of Regulation (ZOR)* and *Facing Your Fears in School (FYF-S)* for autistic students (Table 1). At baseline, ISPs reported prior formal training in and current use of popular manualized school-based programs, and the Evidence-Based Practice Attitudes Scale (EBPAS; 2004). Frequency of formal training in and use of manualized programs was determined. An independent samples t-test was used to compare total scores on the EBPAS between ISPs with any formal training and those without.

Results: Formal training in and use of programs are reported in Figure 1. ISPs reported receiving formal training in and using ZOR and Social Thinking most frequently. ISPs were least likely to have training in or to use MATCH-ADTC. For all programs except MATCH-ADTC, more ISPs used the program regardless of whether they received formal training. ISPs who reported receiving *any* formal training had significantly more positive attitudes about evidence-based practice use ($m=49.9$; $SD=5.8$) than ISPs with no formal training ($m=47.3$; $SD=7.1$): $t(110)=2.0$, $p<.05$).

Conclusions: Results indicated that ISPs often use manualized programs without formal training. They receive the most formal training in ZOR and Social Thinking and use them most often. ISPs with formal training held more positive attitudes toward EBPs, suggesting formal training may be linked to willingness to learn new programs. Alternatively, ISPs with more positive EBP attitudes may be more likely to seek formal trainings. Further research is needed to examine the directionality of this relationship and how formal training relates to other implementation variables, such as intervention fidelity.

**415.307 Does Inclusion Promote Postsecondary Success? a Study of Autistic High School Leavers**

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Background: Autistic high school graduates have been less likely to prepare for college in high school compared to their neurotypical peers (Longtin, 2014). Recent initiatives to improve college attendance among this group have led to a significant increase in rates of autistic young adults enrolling in college (Bakker et al., 2019). Factors such as academic performance, parents' expectations, high school type, and annual household income have all been identified as significant predictors of participation in postsecondary education (Chiang et al., 2011). While previous studies have highlighted the benefits of high school inclusion for postsecondary outcomes for those with learning disabilities or emotional disabilities (Rojewski et al., 2013), little is known regarding autistic high school graduates.

Objectives: To close the research gap, this study examines whether time spent in general education predicts autistic high school graduates' enrollment in post-secondary education.

Methods: This study used longitudinal administrative record data (2005-2018: pre-pandemic) from a large urban school district in the southwest United States. For this study, out of 140,947 with primary eligibility of autism, we selected a total of 932 participants, excluding those that had missing values. Participants were ages 14-22, predominantly male (82.94%), low-income (53.43%), and racially and ethnically diverse (54% Hispanic, 20% White, 11% African American, 8% Asian, and 6% other.). Logistic regression analysis was conducted.

Results: The logistic regression analysis revealed a significant intercept ($B = -2.64$, $SE = 0.47$, $z = -5.64$, $p < 0.001$), indicating that the log odds of attending college significantly differed from zero when controlling for participants' gender, English language learner, ethnicity, and household income. Time spent in general education (GE) was a significant predictor of college attendance ($B = 1.54$, $SE = 0.29$, $z = 5.33$, $p < 0.001$), with the odds of attending college increasing by 4.65 times for each additional unit of GE ($OR = 4.65$, 95% CI [2.64, 8.21], $p < 0.001$). Following the time spent in GE, participation in GE curriculum also significantly predicted college attendance ($B = 2.54$, $SE = 0.22$, $z = 11.52$, $p < 0.001$), with the odds of attending college increasing by 12.63 times compared to students in the alternative curriculum ($OR = 12.63$, 95% CI [8.29, 19.69], $p < 0.001$).

Conclusions: The results demonstrate that spending more time in GE and participating in GE curriculum significantly predict post-secondary education involvement for autistic high school graduates, aligning with previous research that highlights academic performance as a significant predictor of college attendance for autistic high school leavers (Chiang et al., 2011). While this study does not account directly for the participants' academic performance, prior research suggests that autistic students who were included in GE had better academic achievement compared to those in self-contained classrooms (Kurth & Mastergeorge, 2010). Limitations were: there were many participants that the school could not reach, and we did not have IQ scores of participants, which in the past have shown an association with their educational placement. Future studies on the influence of inclusion in long-term outcomes are needed.

415.308 Effects of an Internet-Delivered Psychosocial Program for Parents of Children with Autism and ADHD: A Randomized Controlled Trial

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Background:

Recent research indicates that psychosocial interventions incorporating psychoeducation and cognitive-behavioral training for parents can effectively manage children with autism spectrum disorder (ASD) and attention deficit hyperactivity disorder (ADHD) (Young et al., 2020). These interventions empower parents to regulate their children's behavior, positioning caregivers as agents of change. However, traditional interventions often face limitations, such as non-randomized study designs and accessibility barriers for families (Tan-McNeill et al., 2021). In-person formats can pose logistical challenges, particularly for families in rural areas or those struggling with work-life balance, which restricts access to evidence-based treatments. Despite the proven benefits of structured interventions, many children with ASD, ADHD, or both still lack access to these essential psychosocial supports (Danielson et al., 2018).

Objectives: This study aimed to assess the effects of an internet-delivered psychosocial program on parenting stress, coping strategies, and the social-behavioral outcomes of children with ASD and ADHD.

Methods: Parents of children aged 7 to 11 years with ASD and ADHD were randomly assigned in a 1:1 ratio to either the Psychosocial Program group (n=42) or a Control group (n=40). The psychosocial program was delivered remotely online. Parent-reported measures of parenting stress, coping strategies, and children's social behavioral problems were assessed at three time points: before the intervention (T1), immediately after the intervention (T2), and six months post-intervention (T3). Two-way mixed analysis of variance (ANOVA) was conducted with group (intervention vs. control) as the between-subjects factor and time (pre-, post-intervention, and follow-up) as the within-subjects factor.

Results:

Parents in the Psychosocial Program group reported significantly lower levels of parenting stress and higher positive coping strategies at T3 compared to the Control group. Additionally, improvements in child social behavioral problems were observed in the intervention group at T2 and T3.

Conclusions:

The findings suggest that this internet-delivered psychosocial program is a promising and accessible approach for empowering parents, reducing parenting stress, and enhancing coping strategies. The program may be particularly beneficial for families with limited access to traditional services, as it can be completed at home. Overall, the online psychosocial intervention for parents of children with ASD and ADHD appears to be an effective and accessible strategy for improving the well-being of both parents and their children.

415.309 Engaging Caregivers in Child Mental Health Services: An Exploration of Provider Strategies and Differences in Hispanic/Latinx Families

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Background: Caregivers play a critical role in their child's mental health therapy. Not only are caregivers facilitating access and attendance to services, meaningful engagement in their child's therapy session is a key component to their child's overall treatment (Haine-Schlagel et al., 2016). For some, socio-cultural factors may contribute to the caregiver's engagement in their child's therapy including, but not limited to, racial, ethnic, or language differences distinct from that of the provider and therapy setting. Research has shown that low-income and/or Hispanic/Latinx families, are more likely to have more limited engagement in their child's mental health treatment compared to their non-Hispanic/Latinx white counterparts (Haine-Schlagel et al., 2022; Dickson et al., 2017; Reyno & McGrath, 2006). Additionally, the quality of care can differ when there is a cultural mismatch between the caregiver and provider of the child's treatment (Kapke & Gerdes, 2016). This highlights the need to examine the use of mental health provider engagement strategies and gaps in caregiver participation to better support mental health services for Latinx autistic youth.

Objectives: Explore mental health provider use of parent engagement strategies in community-based child mental health services for autistic youth and examine differences in caregiver engagement based on ethnicity and cultural match with provider. Differences in therapist and caregiver engagement behaviors were examined by ethnicity and cultural match.

Methods: Data were drawn from a larger project testing an adapted version of an executive functioning intervention, *Unstuck and On Target* (*Unstuck*), for mental health settings. Therapist training of the adapted version of *Unstuck* included evidence-based parent engagement strategies (Haine-Schlagel et al., 2018). Community mental health providers (N=26, 88% female, 61% Non-Hispanic/Latinx White) were videorecorded providing psychotherapy to participating autistic clients and their caregivers (N=32, 90% female, 62% Hispanic/Latinx). Observational coding of a subset of recorded sessions were completed assessing therapist use engagement strategies along with the caregiver's in session attendance and participation in child's therapeutic activities using the established Therapist Alliance, Collaboration, and Empowerment and Parent Participation Engagement coding systems (Haine-Schlagel & Martinez; 2014a,b).

Results: Results from our multilevel analyses indicated significant differences in therapist use of engagement strategies (p 's <.05), with higher therapist use of alliance ($M_{\text{Hispanic/Latinx}}=2.69$, $M_{\text{Non-Hispanic/Latinx}}=1.39$) and attending to the feasibility of home action ($M_{\text{Hispanic/Latinx}}=1.03$, $M_{\text{Non-Hispanic/Latinx}}=2.10$) with Hispanic/Latinx versus Non-Hispanic/Latinx caregivers. Similarly, analyses indicated higher use of caregiver discussion of home action plans among Hispanic/Latinx ($M_{\text{Hispanic/Latinx}}=1.03$) versus Non-Hispanic/Latinx ($M_{\text{Non-Hispanic/Latinx}}=2.10$) caregivers, ($p<.05$). In contrast, Non-Hispanic/Latinx caregivers demonstrated significantly more participation in therapy activities ($M_{\text{Non-Hispanic/Latinx}}=3.47$) compared to Hispanic/Latinx caregivers ($M_{\text{Hispanic/Latinx}}=2.12$; $p<.05$). Further analyses exploring further caregiver and therapist demographic factors as well as differences by treatment condition will also be examined.

Conclusions: Overall and in contrast to prior literature, results indicate higher therapist use of engagement strategies and some higher caregiver engagement behavior, particularly around home-action planning. However, non-Hispanic/Latinx caregivers demonstrated overall higher participation in therapeutic activities, which is consistent with prior work in this area. Findings point to key areas for further efforts to develop and target strategies to support successful engagement of Hispanic/Latinx families in mental health services.

415.310 Engaging Neurodivergent Learners through Gamified Quiz Platforms: An Approach to Inclusive Education

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Background: Tests are subject to being biased due to factors like increased anxiety and boredom (Meijer, 2007; Goetz, 2023). These difficulties may be even more severe for autistic individuals who have an increased likelihood of anxiety (White, 2009). As such, it could be highly beneficial to find nontraditional mechanisms for test-taking that encourage student participation. Prior work with neurotypical students has identified that gamification may motivate and improve understanding of educational materials (Borges, Durelli, Reis, & Isotani, 2014). While the majority of previous work on gamification has studied neurotypical individuals, newer work has similarly shown that autistic individuals are also more inclined to focus on study material when it is gamified. (Rodríguez Jiménez & Ramos Navas-Parejo, 2019).

Objectives: To determine whether gamified quizzes can improve engagement and thus measured learning outcomes for autistic young adults.

Methods: We piloted the use of competitive, gamified quizzes to test knowledge. The gamified quizzes allow students to earn points based on a combination of correctness and speed. 8 autistic young adults (ages 18-29) with level 2 support needs (1 with and 7 without intellectual disabilities) participated in these quizzes to test their knowledge in context of a social media literacy course. This was done for various concepts during several hour-long educational sessions. Participants could also select which character to use for their player icon and a leaderboard displayed the character of the leading student. All participants were classmates from the previous semester and were starting their second semester at their residential program. We audio recorded and analyzed student's utterances during the gamified quiz.

Prior to the INSAR, we will deploy a full study for a 14-week long full social media literacy course. A new set of students will be recruited from the residential facility and divided into two classes of 8 students each. One class will use the traditional quiz format for their knowledge tests of social media literacy, while the other class will use the gamified quiz format. To evaluate whether students perform better with the gamified quiz, we will compare pre- and post- test improvement between the two classes using the Wilcoxon Signed-Rank test. To compare whether the gamified quiz led to significantly better scores, we will use the Mann-Whitney U test.

Results: Preliminary findings indicate that utilizing gamification results in greater improvement in knowledge test scores. Qualitative insights suggest that a reason for this improvement is because students were more excited about the competitive aspect of the gamified version. For example, when students did well, they would often share that with other students, "I was on fire." We are still running this study and will report the full results at the conference.

Conclusions: Our initial results indicate that gamification can be a beneficial educational tool for measuring knowledge with autistic young adults who know one another. This work suggests another way educators can motivate their emerging adults to take knowledge tests in an educational setting.

415.311 Enhancing Executive Functioning: Online Caregiver Training and a Project Extension for Community Healthcare Outcomes-Based Maintenance Program

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Background:

Executive function-related challenges are common in autistic children and adolescents (Pellicano, 2012). Parent-mediated interventions are an evidence-based practice used to provide caregivers the tools to best support their children (Tarver et al., 2019). Recent research has shown promising results in using this technique in an online format to teach parents skills to aid their children's executive functioning differences (Kenworthy et al., 2023). Further research in the parent training literature indicates the potential long-term benefit of "booster sessions" in maintaining the skills learned in parent-mediated interventions (Van Kamp et al., 2008).

Objectives:

- 1) The first study seeks to provide additional support for the online *e-Unstuck and on Target* program combined with a weekly, telehealth group parent coaching session (Kenworthy et al., 2014, 2018).
- 2) The second study seeks to examine preliminary acceptability data related to an extension of this program for previous participants, designed to facilitate maintenance and generalization of skills learned using the Project Extension for Community Healthcare Outcomes (Project ECHO) model (Arora et al., 2016).

Methods:

STUDY 1: 73 parents of children and adolescents age 5-14 ($M = 9.37$, $SD = 2.64$) with ASD were randomly assigned to either a waitlist control ($N = 38$) or a training and coaching group ($N = 35$). Parents in the parent coaching group were asked to complete one module, weekly, of the *e-Unstuck and On Target* parent training program over the course of 9 weeks, while the waitlist control group completed these modules following their 9-week waiting period. The *Behavior Rating Inventory of Executive Function- Second Edition (BRIEF-2)* (Gioia et al., 2015) was completed pre- and post-program participation as well as before and after the waitlist time period.

STUDY 2: Previous participants in the *e-Unstuck and On Target* program were invited to participate in a four-part series of hour-long trainings using the Project ECHO framework as a maintenance tool for executive-functioning related parenting skills. Preliminary qualitative and quantitative acceptability data were analyzed.

Results:

STUDY 1: An independent sample t-test was conducted comparing change scores on the *BRIEF-2* Global Executive Composite between the waitlist control group and the parent coaching group. Results revealed no significant differences between the BRIEF-2 scores in the waitlist and the parent coaching group ($p > .05$).

STUDY 2: Preliminary program satisfaction data found that 89% of participants either agreed or strongly agreed with the statements, "I and/or my child benefitted from the program", and, "this program helped me more effectively support my child's executive functioning."

Conclusions:

There were no differences between the parent coaching group and waitlist groups in parent-reported executive functioning outcome data, indicating that the program did not significantly improve child executive functioning relative to the waitlist control. High satisfaction ratings of the Project ECHO-based extension of the program indicate that this add-on maintenance program was acceptable for previous participants in the program. Future studies should evaluate whether participants in this maintenance program experience improvement in their child's executive functioning to assess for the delayed impact of the skills learned in the program.

415.312 Enhancing Sexual and Reproductive Health Support for Adolescents with Autism Spectrum Disorder in Ethiopia: A Culturally Tailored Multi-Intervention Model

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Background: The Joy Center for Children with Autism, a pioneering organization established in 2002 in Ethiopia, has been dedicated to providing interventions for children with autism and supporting their families in Ethiopia. As one of the first centers of its kind in the country, the Joy Center developed culturally responsive strategies to address the unique needs of autistic youth, particularly in the area of sexual and reproductive health (SRH). Adolescents with autism spectrum experience typical sexual development, but their understanding and expression of sexual feelings can differ significantly from their neurotypical peers due to challenges in social comprehension, sensory processing, and emotional regulation. At the Joy Center, these differences manifest in behaviors such as public displays of sexuality, difficulties in interpreting social cues, and heightened vulnerability to exploitation, posing unique challenges for caregivers and educators. This presentation will share the results of culturally sensitive multi-model interventions to address these complex SRH needs, showcasing our approach within the Ethiopian context.

Objectives: This presentation will discuss our experiences and outcomes of a comprehensive multi-tiered intervention addressing the SRH needs of autistic adolescents. Participants will acquire practical insights into implementing similar interventions tailored to the social, cultural, and developmental requirements of autistic youth.

Methods: We implemented a multifaceted culturally responsive intervention encompassing the following:

- **Development of SRH Knowledge Materials:** Customized training manuals for educators, parents, and health professionals were developed to address the specific SRH needs of adolescents with ASD.
- **Training Programs:** Comprehensive training sessions were conducted for parents, educators, and healthcare providers, focusing on ASD-specific SRH education and a Specialized SRH
- **Education Room:** A sensory-friendly environment equipped with visual aids, anatomical models, and audiovisual resources was established to facilitate SRH learning in a structured and sensory-appropriate setting.
- **Coordinated Clinical Support:** Clinical teams collaborated to manage behavioral instability and address hyperactive sexual behaviors through targeted medical and behavioral interventions.
- **Data was collected through monthly community discussions—"Saturday Coffee Mornings"—conducted over one year with 60-100 participants, including parents, educators, caregivers, and staff. The recorded discussions and facilitator notes were analyzed using content analysis, providing valuable insights into the program's effectiveness from a community perspective.**

Results: Preliminary findings from our initiative demonstrate notable improvements in caregivers' and professionals' understanding of the SRH needs of adolescents with autism. The sensory-friendly SRH education room effectively reduced inappropriate behaviors and increased student engagement. The training programs empowered caregivers and educators with practical skills, whereas media outreach raised societal awareness and fostered greater empathy around the SRH challenges faced by autistic youth.

Conclusions: This presentation offers a roadmap for supporting youth with autism in their sexual and reproductive health needs, stressing cultural sensitivity, caregiver empowerment, and sensory-friendly resources. Attendees will gain a practical, adaptable model emphasizing cultural sensitivity and community involvement to support the SRH needs of autistic youths. This approach underscores that, even in low-resource settings, structured interventions can significantly enhance the well-being and social inclusion of neurodivergent youth.

415.313 Evaluating How Interdisciplinary School Providers Preliminarily Deliver and Adapt Two Manualized Programs Rooted in Cognitive Behavior Therapy (CBT) for Autistic Students with Anxiety

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Background:

Implementing cognitive behavior therapy programs (CBT) in schools may increase access to mental health services for autistic children (Reaven et al., 2024). Although a growing body of research is evaluating the effectiveness of CBT when delivered in schools, less is known about how well these programs are implemented and whether they are adapted within schools. The current study sought to address this gap as part of a comparative effectiveness trial evaluating two CBT programs implemented in elementary and middle schools, Facing Your Fears in Schools (FYF-S) and Zones of Regulation (ZOR).

Objectives:

- Evaluate Interdisciplinary School Providers' (ISPs) fidelity and adherence to FYF-S and ZOR.
- Explore how ISPs adapt FYF-S and ZOR during implementation.

Methods:

This study includes preliminary data from 56 ISPs across 26 school teams who were randomized to deliver FYF-S or ZOR to anxious autistic students ages 8-14 years. Sixteen school teams comprising of 36 ISPs were trained in FYF-S, and 10 school teams comprising of 20 ISPs were trained in ZOR. ISPs across both conditions submitted recordings from 322 FYF-S or ZOR sessions. Fidelity was scored by trained raters for 132 sessions using program-specific tools. Fidelity scoring accounted for adherence to specific program activities (i.e., percent of activities completed), in addition to the quality of program activities rated on a 5-point Likert scale (i.e., fidelity). Additionally, scored sessions were rated for the presence of adaptations based on the Framework for Reporting Adaptations and Modifications, Expanded (FRAME). Descriptive statistics were used to summarize adherence, fidelity, and adaptations across FYF-S and ZOR, along with average number of lessons completed and average duration of lessons.

Results:

Schools assigned to FYF-S completed an average of 11/ 12 lessons, where each lesson was M=40.71 minutes; Schools assigned to ZOR completed an average of 15/ 18 lessons where lessons were M=29.71 minutes. Schools across both interventions adhered to core components similarly with FYF-S at M=75.09% and ZOR at M=73.55%. Similarly, school teams' average FYF-S fidelity was 72.21% and was 71.72% for ZOR. However, for FYF-S specifically, fidelity was notably higher for psychoeducation-based lessons (M=76.41%) in comparison to exposure-based sessions (M=66.33%). Regarding adaptations, FYF-S teams split lessons across group sessions 16 times whereas ZOR teams only did once. In contrast, ZOR teams were more likely to combine ZOR lessons and did so a total of 12 times, where FYF-S schools combined lessons only once.

Conclusions:

Preliminary data indicates similar FYF-S and ZOR adherence and fidelity when delivered to anxious autistic students within schools. Despite some differences in session length, autistic students appeared to receive similar intervention quality regardless of study condition. However, results highlighted more prominent differences in the adaptations made by ISPs across the programs. Findings also suggest that FYF-S may become more difficult to deliver as the lessons change from psychoeducation to exposure and may indicate that ISPs need more support delivering graded exposure within school settings. Future research will evaluate predictors of FYF-S and ZOR fidelity and will evaluate the relationship between program fidelity and student outcomes.

415.314 Evaluating Student Profiles at an Autism Summer Treatment Program: Analysis of Stress and Belongingness

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Background:

A sense of belongingness describes an individual's feeling that they are respected and accepted by others in a particular environment based on shared experiences and beliefs (Mahar et al., 2013). A strong sense of belongingness is a human need and plays a role in healthy development and is associated with higher subjective well-being for youth (Afroz & Tiwari, 2021). Conversely, a sense of thwarted belongingness for children is associated with negative mental health outcomes including higher rates of anxiety (Timmons et al., 2011). Research has shown that autistic youth feel higher rates of anxiety and lower rates of belongingness than their allistic peers (VanderBroek Stice, L., Lavner, J.A., 2018). Little research has explored interventions to increase perceived belongingness in autistic youth. Similarly, reported anxiety is higher in autistic youth than typically developing populations and research shows that direct intervention is a useful tool to provide autistic youth with coping strategies for anxiety (Sohmaran & Shorey, 2019).

Objectives:

1. Evaluate the effects of a summer treatment program on child-perceived belongingness and anxiety.
2. Explore the relationship between belongingness and anxiety.
3. Evaluate parent concerns with observable camper behavior to create camper behavior profiles (internalizing vs. externalizing).

Methods:

This study evaluated 23 participants between 7-13 ($M=9.81$, $SD=2.69$) with a diagnosis of autism at a summer treatment program (STP). The STP's activities were based on Cognitive Behavior Therapy (CBT) and Applied Behavior Analysis (ABA). Over 4 weeks, participants engaged in intervention to develop social and emotional regulation skills. Caregivers received training around social-emotional health and behavioral interventions to generalize impact at home. Data collection happened weekly and was overseen by research staff.

Repeated measures ANOVAs were conducted to analyze mean score improvement on the Screener for Child Anxiety Related Disorders (SCARED) and Sense of Social Fit Scale (SSFS). Pearson correlations analyzed the relationship between belongingness and stress. Qualitative data was taken from parents and observed participant behavior to analyze who exhibited more internalizing or externalizing behaviors. Pearson's correlations were conducted to evaluate the relationship between externalizing and internalizing behaviors and stress and belongingness.

Results:

One Way ANOVA results indicated that camper anxiety] fell over the course of the STP ($F(2,50)=6.12$, $p<0.05$). Campers reported increases in belongingness, however, these increases were not statistically significant ($F(2,50)=1.47$, $p=.239$). Anxiety and belongingness were not significantly correlated ($r^2=.05$, $p=0.61$). However, anxiety was correlated with age such that older campers felt more anxiety ($r^2=0.23$, $p=0.04$). Caregiver data suggests that concerns were primarily challenging behavior (i.e. physical aggression) and social skills training.

Conclusions:

Results indicate that participation in a STP can reduce stress reported by autistic youth and marginally increase perceived belongingness. Parent reports and staff observations reveal that autistic youth with more internalizing behaviors were at risk for more anxiety and less perceived belongingness. Exploratory analyses showed that participants felt less stress the longer they participated in the STP. Results should be replicated with a larger sample over a longer period of time and should evaluate the long term effects of STPs on stress and belongingness.

415.315 Evaluating the Feasibility, Safety, Efficacy, and Neural Correlates of Accelerated Continuous Theta-Burst Stimulation Targeting the Left Primary Motor Cortex to Improve Social Communication Impairment in Autistic Children: An Open-Label Trial
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Background:

Social communication impairment is a core symptom of autism spectrum disorder (ASD) for which there is currently no effective treatment. Repetitive transcranial magnetic stimulation (rTMS) is a promising intervention, but no effective protocol has been validated.

Objectives:

This study investigated the feasibility, safety, efficacy, and neural correlates of accelerated continuous theta-burst stimulation (a-cTBS) over the left primary motor cortex (M1) in autistic children.

Methods:

The a-cTBS intervention consisted of 10 sessions per day for 5 consecutive days. We estimated the average treatment effect by comparing 1-month changes in Social Responsiveness Scale (SRS) scores between the single-arm trial (N=25) and historic controls (N=24) using mixed-effect models, with potential confounders handled using inverse probability of treatment weighting (IPTW). Electroencephalogram (EEG) data were collected before and immediately after treatment to estimate power spectral density (PSD) of each channel. Single-word comprehension was measured by the Peabody Picture Vocabulary Test (PPVT) before the treatment and at 1-month follow-up.

Results:

All participants completed the full course of the intervention and adhered to the 1-month follow-up. The a-cTBS treatment was associated with a reduction of 17.4 points (IPTW-weighted β , 95% CI, -20.1 to -15.0; $P<.001$) in SRS total scores within one month compared to historic controls. An increase in alpha PSD of the right parieto-occipital region immediately after the intervention was associated with changes in SRS scores within the same period and predictive of changes in SRS scores at the 1-month follow-up ($P=0.041$). A greater responsiveness in 1-month changes in SRS showed a trend toward the increase in single-word comprehension scores (adjusted β for PPVT IQ, -0.23, 95% CI, -0.52 to 0.06, $P=0.110$). Thirty-three percent of participants reported mild adverse events that resolved spontaneously.

Conclusions:

The proposed a-cTBS protocol was feasible, safe, and showed promise in treating social communication impairment in autistic children. Further randomized trials are needed to validate its clinical efficacy.



415.316 Evaluating the Impact of Toastmasters® for Autistic Adults: A Mixed-Methods Approach and Pilot Study

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Background: Autistic adults often experience social and communication challenges that can hinder their personal and professional development. Programs are needed to build upon the strengths of autistic people and limit the pressure to camouflage their true selves. Community-based programs like Toastmasters®, a widely recognized and respected global public speaking and leadership development program, may provide structured environments for improving these skills, but little research has been done on their specific outcomes for autistic individuals. This two-phase study investigated the meaningfulness of Toastmasters® for autistic adults, with stakeholder insights from phase 1 and a pilot study in phase 2.

Objectives: In phase 1, we aimed to identify contextual factors that influence outcomes for autistic participants in Toastmasters® and assessed the program's feasibility, including participant satisfaction, perceived benefits, and the acceptability of procedures. In phase 2, the pilot study aimed to evaluate the program's effectiveness in improving communication skills, self-confidence, and social functioning.

Methods: In phase 1, semi-structured interviews were conducted with 22 autistic Toastmasters® participants and 11 caregivers or Toastmasters® mentors. The majority of autistic participants identified as White (59%), male (68%), and between the ages of 25 and 44. Caregivers and mentors were predominantly White (91%), female (81%) and over the age of 55. Thematic content analysis identified key themes regarding the program's impact. Quantitative data were also collected on participants' involvement, including the number of clubs attended, duration of participation, and time commitment. Phase 2 involved a waitlist-controlled pilot trial with 18 new autistic participants completing a 10-week Toastmasters® program and 14 mentors. Autistic participants predominantly identified as White (44%) or Asian (28%), male (56%), and between the ages of 18 and 34. Mentors largely identified as White (50%) or Asian (29%), female (64%), and between the ages of 45 and 74. Pre-post measures were collected on comfort with public speaking, leadership skills, peer relationships, and camouflaging behaviors. Social validity of the program was also assessed from autistic participants' and mentors' perspectives.

Results: From phase 1, key themes included perceived improvements in public speaking and communication, self-confidence, leadership, and sense of community. Unexpected benefits, such as improvements in daily living skills, mental health, and social connections, were also reported. Challenges related to program logistics and feedback processes were noted, indicating a need for further exploration of autism-specific accommodations within Toastmasters®. Pilot data from phase 2 are currently undergoing scoring and analysis, which will be completed by the end of 2024.

Conclusions: Findings from phase 1 of the study suggest that Toastmasters® may be a valuable, community-based program for enhancing social, communication, and personal development among autistic adults. While the program offers significant benefits, adjustments such as tailored feedback and increased mentorship, could enhance its effectiveness. Phase 2 of the study, a pilot trial of autistic adults new to Toastmasters®, further explores these findings, focusing on measurable improvements in key areas and program adaptations.

415.317 Examining Mental Health and Non-Mental Health School Providers' Training in and Use of Cognitive Behavior Therapy Programs for Autistic Students

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Background: Cognitive Behavioral Therapy (CBT) has been shown to be effective when delivered to anxious autistic students within public schools (Perihan et al., 2020; 2022; Reaven et al., 2023). When provided resources, school providers with different training levels and experiences can identify students for CBT (Choi et al., 2022) and deliver CBT effectively. However, it remains unclear whether school providers' discipline and experience shapes their use of CBT for autistic students. This study addresses this gap by examining differences in use of CBT-based manualized programs for autistic students across interdisciplinary school providers (ISPs) from mental health (MH), including school psychologists, social workers, and school counselors, and non-mental health (NMH) backgrounds, including special educators, speech-language pathologists, and occupational therapists.

Objectives: This study aims to: 1) examine ISPs baseline experience with various manualized programs for anxiety and emotion regulation (e.g., Coping Cat, BrainWise, Facing Your Fears, Zones of Regulation); and 2) explore differences in training and use of these programs for autistic children between MH and NMH school providers.

Methods: This study was conducted as part of an ongoing comparative effectiveness trial of two school-based programs for autistic students. Baseline data was collected from 147 ISPs from MH and NMH backgrounds. Information regarding age, race, ethnicity, and gender was obtained as well as ISP work experience and professional background. Manualized program use was measured via a survey where ISPs indicated previous training in programs based on CBT principles for anxiety and emotion regulation and reported how frequently they used each of these programs. Independent t-tests were used to analyze program use, training, and frequency by ISP discipline. Pearson's correlation analyses were used to assess the relationship between ISP professional experience and their experience working with autistic youth in schools.

Results: There were significant differences found between MH and NMH ISPs in their experience with manualized programs. MH ISPs reported greater use of these programs ($M = 2.63$, $SD = 1.87$) than NMH ISPs, ($M = 1.27$, $SD = .98$) : $t(102) = 5.39$, $p < .001$, and more training in manualized programs ($M = 1.16$, $SD = 1.35$) compared to NMH ISPs, ($M = .63$, $SD = 1.24$) $t(137) = 2.42$, $p = .017$. Furthermore, MH ISPs reported using manualized programs more frequently ($M = 8.28$, $SD = 2.92$) than NMH ISPs, ($M = 7.1$, $SD = 1.95$) : $t(115) = 2.63$, $p = .010$. ISP's years of experience addressing emotional regulation or anxiety in general or special education was highly correlated with the number of years they reported working with autistic youth in schools, $r(136) = .93$, $p < .001$.

Conclusions: Overall, baseline data reveals that ISPs from MH backgrounds have greater experience with programs rooted in CBT principles than ISPs from NMH backgrounds. Given the known effectiveness of CBT programs for autistic students, this study emphasizes the need to bridge the gap between MH and NMH ISP's manualized school-based program use and training in schools. Future work can be done to ensure that NMH staff are provided with training in school-based manualized programs for anxiety to support anxious autistic students.



415.318 Examining the Relationship between Parenting Practices and Child Adaptive Behaviors

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Background:

Research indicates that autistic individuals typically exhibit lower adaptive skills than both their typically developing and developmentally delayed peers (Klin et al., 2007; Franchini et al., 2018). Adaptive skills, defined as learned behaviors, are positively influenced by parenting practices such as sustained maternal responsiveness and authoritative approaches (Ghotbzadeh & Shakerinia, 2015; Warren et al., 2017; Balboni et al., 2020). Conversely, permissive and authoritarian styles are negatively associated with adaptive skills (Ghotbzadeh & Shakerinia, 2015). Given that early adaptive skills predict later outcomes (Bal et al., 2015), understanding the role of parenting behaviors is crucial for guiding interventions for autistic individuals.

Objectives:

We seek to determine whether 1) positive parenting behaviors improve pre- to post- participation in behavioral parent training (BPT) and 2) positive parenting behaviors are associated with adaptive behaviors.

Methods:

Participants included 88 children (61.7% male, M age = 4.48 years, SD = 1.01; 53.4% Hispanic/Latino) and their parents. Adaptive skills and parenting behaviors were collected prior to intervention (Time 1; T1). Between these two time points, parents participated in a BPT intervention. Parenting behaviors were assessed immediately after the intervention (Time 2; T2), while adaptive skills were collected at a follow-up point that varied across participants. Adaptive skills (daily living skills, socialization and communication) were assessed using the Vineland Adaptive Behavior Scales – Third Edition (VABS-III; Sparrow, Cicchetti, & Saulnier, 2016). Parenting behaviors were measured through the Parent-Child Behavior Observation System (PC-BOS; Phaneuf & McIntyre, 2007), which records behaviors during free-play, clean-up, and structured tasks in 30-second intervals. Behaviors coded included intrusion, inappropriate commands, lack of follow-through, and praise, with codes across tasks combined to create composite variables.

Results:

Paired samples t-test indicated significant improvements from T1 to T2 in positive parenting behaviors, daily living skills, and socialization, but not in communication (see Table 1). Correlational analyses were conducted to assess the relationships between baseline parenting behaviors and adaptive behaviors at T1 and T2 (see Table 2). Results revealed that baseline parent intrusive behaviors were negatively correlated with child communication and daily living skills at T1 and T2. Lack of follow-through was negatively correlated with T1 and T2 communication and daily living skills. Parent inappropriate commands also showed negative correlations with child communication and daily living skills at T1 only. Parent praise showed no significant correlations with child adaptive skills at T1 or T2. Future analyses will employ structural equation modeling (SEM) to investigate the relationships influencing T2 adaptive skills, accounting for time, T1 and T2 parenting behaviors, participation in BPT, child IQ, and diagnosis group. SEM will allow for the simultaneous examination of both direct and indirect effects, capturing the complex interplay between these variables over time.

Conclusions:

Our findings highlight significant improvements in positive parenting practices and daily living skills and socialization following BPT. Given that adaptive skills are learned behaviors, these results emphasize the need for further research to explore the specific mechanisms through which parental practices influence the development of these skills. Understanding how certain parenting behaviors directly support skill acquisition is crucial.



415.319 Exploring the Influence of Provider-Reported Adaptations on Parent Participation Engagement in Part C Early Intervention
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Background: Community-based clinicians delivering autism parent-mediated interventions report a need to adapt intervention protocols to address issues related to engagement and cultural relevance (Barnett et al., 2019). This is especially relevant when working with families from minoritized communities who encounter increased structural inequities and attitudinal barriers that have been shown to impact their engagement (Smith et al., 2020). While these adaptations are inherent in usual practice, limited research has examined how they relate to parent participation engagement (PPE; active, independent, and responsive engagement) and how demographic factors moderate this relationship.

Objectives: The current study aims to explore how provider-reported adaptations for Caregiver-Implemented Reciprocal Imitation Teaching (CI-RIT) are related to parent engagement and determine whether these effects are moderated by parent minoritized status.

Methods: EI providers in Part C systems implemented CI-RIT, an evidence-based social communication intervention, as part of an effectiveness-implementation trial. Parents ($n=54$) participated in weekly EI sessions with their provider ($n=30$) over four months. Up to three session recordings ($n=114$) for each parent-provider dyad were behaviorally coded with the *Parent Participation Engagement Observational Coding Scheme* to assess PPE. Providers rated the extent to which they adapted CI-RIT (e.g., content, coaching, pacing, and logistical adaptations) within three months of implementation for each family using a 5-point Likert scale. A 3-level multilevel model was conducted to examine the impact of overall adaptations on PPE given the repeated and nested nature of the PPE data. The model assessed the influence of adaptations and parents' minoritized status (i.e., families indicating Latine ethnicity and/or non-white race; $n=30$ minoritized families) on average PPE, controlling for marital status, household income, and session modality.

Results: Preliminary findings suggest a statistically significant interaction between adaptations and parent minoritized status, indicating that the effect of adaptations on PPE varied based on the parent's minoritized status (Table 1). A simple slopes analysis suggested that minoritized parents working with providers who reported higher adaptations demonstrated greater engagement, whereas non-Latine White parents working with providers who reported higher adaptations demonstrated lower engagement.

Conclusions: Findings highlight the significant role of adaptations in influencing parent engagement for minoritized families, particularly in the context of a parent-mediated intervention (CI-RIT). The interaction between adaptations and minoritized status revealed that higher adaptations were associated with greater engagement among minoritized parents, indicating that minoritized families may benefit more from flexible, culturally responsive approaches for active engagement. Given the different effects by minoritized status, further research is warranted to explore the specific types of adaptations that are most effective for different groups and to better understand the mechanisms underlying these differential effects.



415.320 Exploring the Relationship between Emotional Control and Ritualistic Behaviors in Youth with and without Autism Spectrum Disorder

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Background: Autism Spectrum Disorder (ASD) is a complex neurodevelopmental condition that affects an individual's ability to communicate and interact with others (Orsmond 2004). It is characterized by restricted repetitive behaviors and interests (RRBs). Studies have alluded to the fact that a relationship exists between RRBs and difficulties with emotional regulation in individuals with ASD (Martínez-González et al. 2022). However, a better understanding of this relationship and a more targeted approach is not only critical for improving therapeutic approaches for individuals with ASD, but also to understand the underlying mechanisms of disorder.

Objectives: This study aimed to understand the relationship between emotional control and compulsive and ritualistic behaviors in youth aged 8-17 years with and without ASD. We hypothesize that participant groups with ritualistic and compulsive behaviors specifically will have lower emotional control.

Methods: Data were collected from the GENDAAR study, which assessed biological sex differences in autism. Final analyses included 177 autistic youth (44% female) and 168 typically developing (TD) youth (49% female). ASD diagnosis was confirmed via ADOS and ADI and all participants had an IQ $\geq$ 70. Emotional control was measured using Behavioral Rating Inventory Executive Functioning (BRIEF) T-scores from the Emotional Control scale, Compulsive (CompB) and Ritualistic Behaviors (RitB) were assessed as present (score>0) or absent (=0) from the Repetitive Behavior Scale-Revised (RBS-R) subdomains. We examined group differences between emotional control for individuals with and without compulsive and ritualistic behaviors by using Welch Two Sample T-Tests. We then examined the role of age with Emotional Control.

Results: In the autistic youth, 72% reported compulsive behaviors and participants with CompB showed significantly worse Emotional Control than those without ($t(89.2)=-4.54$, $p<0.05$). Similarly, 83% reported ritualistic behaviors and had worse Emotional Control than those without RitB ($t(43)=-4.83$, $p<0.05$). This relationship was also seen in the TD youth, where individuals with CompB (18%) and RitB (11%) compared to those who did not have lower Emotional Control ($t(36.20)=-3.87$, $p<0.05$; $t(20.25)=-2.20$, $p<0.05$, respectively). We also found Emotional Control was not related to Age in the ASD group ($r=0.001$) and TD group ($r=0.01$).

Conclusions: Results suggest that individuals who have compulsive and/or ritualistic behaviors struggle with emotional control. While our primary focus was to evaluate this in autistic youth, our comparison group of typically developing youth also showed these same relationships. Thus, it is important to consider that interventions targeting emotional control may have bi-directional influences on each other in childhood. Further exploration of additional factors, such as gender and sex, will help to better understand these relationships. Longitudinal data will also be necessary to understand predictive relationships.

Citations:

Martínez-González AE, Cervin M, Piqueras JA. Relationships Between Emotion Regulation, Social Communication and Repetitive Behaviors in Autism Spectrum Disorder. *J Autism Dev Disord*. 2022 Oct;52(10):4519-4527. doi: 10.1007/s10803-021-05340-x. Epub 2021 Oct 28. PMID: 34709530; PMCID: PMC8551658.

Orsmond, G. I., Krauss, M. W., & Seltzer, M. M. (2004). Peer relationships and social and recreational activities among adolescents and adults with autism. *Journal of autism and developmental disorders*, 34(3), 245–256. <https://doi.org/10.1023/b:jadd.0000029547.96610.d8>

415.321 Facing Your Fears for Autistic Youth: Individual Factors Related to Improved Mental Health Outcomes in a CBT-Based Anxiety Intervention

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Background: Autistic youth experience higher rates of anxiety than their non-autistic peers (e.g., Hennessy et al., 2023). Updated prevalence rates suggest that approximately 33% of autistic youth experience clinically elevated anxiety levels (Thiele-Swift & Dorstyn, 2024). Adapted cognitive behavioural therapy (CBT)-based interventions, such as *Facing Your Fears* (FYF; Reaven et al., 2011), have been effective in reducing anxiety symptoms of this group (e.g., McMorris et al., 2024; Reaven et al., 2012; Solish et al., 2020). However, few studies have identified which autistic youth (based on individual characteristics) are most likely to benefit from FYF for treating anxiety.

Objectives: To determine the individual demographic and clinical factors of autistic youth that are related to improved anxiety and mental health outcomes following participation in FYF.

Methods: Thirty-four 8- to 14-year-old ($M = 10.79$, $SD = 1.92$) autistic youth ($n_{cis-male} = 25$) completed 14 weekly sessions of the FYF program for reducing anxiety. Outcome measures (child and parent versions) of anxiety (Anxiety Scale for Children- Autism Spectrum Disorder; ASC-ASD), mental health symptoms (Behaviour Assessment System for Children, Third Edition; BASC-3), and quality of life (Pediatric Quality of Life Inventory; PedsQL) were completed at pre- and post-program. Individual demographic factors included youth's age, sex, age at autism diagnosis, formal anxiety diagnosis, and whether youth had previously or were presently being treated for mental health issues. Paired samples t -tests were conducted to evaluate post-program improvements in outcomes. For those improvements that were significant, change scores were calculated. Change scores of those youth who experienced post-program improvements were correlated (Pearson's r) with the individual factors listed to determine which characteristics were associated with greater program success (i.e., largest magnitude of improvement).

Results: On average, results indicated significant improvements in youth's overall (and specific) anxiety at post-program ($p_s \leq .031$, Cohen's $d_s = .242 - .485$), along with parent-reported internalizing ($p = .006$, $d = .435$), behavioural symptoms ($p = .009$, $d = .439$), and overall quality of life ($p = .001$, $d = .424$). Specifically, upwards of three-fourths of the sample (71-76%) reported reductions in anxiety. Improvements in anxious arousal (as reported by youth) were greatest for those who had no previous mental health treatments ($r = -.664$, $p = .010$). No other significant associations were found, though several approached significance (e.g., $p = .061$).

Conclusions: The findings of this study support previous research establishing FYF as an effective intervention for reducing anxiety in autistic youth. Only one association among program outcomes and individual factors was demonstrated by the results, which suggests that within the sample, no youth in particular (aside from those who had not experienced any mental health interventions prior to FYF) were more likely than others to experience program success. Results are preliminary and based on a limited sample; further data collection is needed to develop an understanding of which youth characteristics (and/or additional factors, e.g., parent or family-level factors) are related to successful program outcomes.

415.322 Families Forward: Development and Proof-of-Concept Trial of a New Program for Transition-Aged Autistic Youth and Their Families

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Background: The transition to adulthood is characterized by insufficient adult autism services, particularly for racially- and ethnically-minoritized youth and families. Families' supportive roles often extend into adulthood, but the lack of support leads families to feel overwhelmed and ineffective. There are surprisingly few evidence-based, family-focused transition programs. No existing programs simultaneously emphasize skills to navigate transition, serve youth across the full autism spectrum, and center cultural considerations by individualizing program content. In response, the current community-partnered project developed a transition planning program that accounts for flexibility across autism presentation and co-occurring conditions, cultural values, family preferences, and readiness to engage in planning. **Families FORWARD (Focusing On Relationships, Well-being, And Responsibility ahead)** is an individually-delivered program that hones families' skills to promote successful transition while centering the autistic youth's vision for the future. Aligned with community feedback, Families FORWARD is geared toward parents, with optional youth participation.

Objectives: Refine Families FORWARD based on community input (Phase 1); test acceptability, feasibility, and clinical promise in a proof-of-concept trial (Phase 2).

Methods: **Phase 1:** a racially-, ethnically-, and linguistically-diverse sample of 20 parents, 6 autistic youth (ages 14-21), and 5 community providers completed qualitative interviews regarding their impressions of the Families FORWARD concept and suggestions for improvement. Feedback was iteratively incorporated into the program description; interviews continued until a final version of the program was reached. **Phase 2:** 14 families participated in a proof-of-concept trial. Families FORWARD was delivered remotely by community coaches. Families completed pre/post measures of mechanistic targets (self-efficacy, knowledge, readiness for change) and outcome (transition preparedness activities) and completed exit interviews. Quantitative data are presented descriptively. Qualitative data were analyzed using directed content analysis. A community advisory board (CAB) of racially-, ethnically-, and linguistically-diverse autistic young adults, parents, and providers guided the research.

Results: **Phase 1:** All participants expressed strong enthusiasm for Families FORWARD, particularly individualized planning goals, flexible youth participation, combined focus on knowledge and skills, and remote delivery via community-based organizations. Based on qualitative data and CAB input, individual culturally-tailored sessions include skill-building (goal-setting, communication, problem-solving, systems navigation) and education about transition-related and adult services (Table 1). **Phase 2:** Findings support the feasibility, acceptability, and clinical promise of Families FORWARD (Table 2). Parents and youth described benefits (e.g., better family communication about the future) and explained how the program facilitated their progress toward future planning goals. One recommendation was to increase youths' (optional) involvement across sessions.

Conclusions: Across racial and ethnic backgrounds and autism characteristics, families were enthusiastic about Families FORWARD, noting that it filled a need currently unaddressed by existing services. The individualized approach increases relevance for all families, aligned with eventual implementation within community settings serving youth with a range of autism presentations and cultural backgrounds. Participation in Families FORWARD may increase youth-centered planning and access to services and launch more positive trajectories of adult functioning, thereby addressing the well-documented difficulties faced by autistic adults. Next steps include incorporating recommendations for increased youth involvement; evaluating the revised program's feasibility, acceptability, and efficacy; and identifying implementation considerations.

**415.323 Feasibility Study of a Novel App-Based Anxiety Intervention for Autistic People**

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Background: At least 50% of autistic people experience clinically relevant anxiety symptoms. However, reasons for elevated rates of anxiety in autism remain poorly understood and there is a high unmet need for novel and adapted therapies for anxiety that are accessible to autistic people.

Objectives: This study aimed to establish the feasibility of a novel app-based anxiety management tool ('Molehill Mountain') that has been developed with, and adapted for, autistic people.

Methods: A non-randomised (single-arm) pilot trial design was employed, whereby autistic people (≥16-years) with mild-to-severe symptoms of anxiety were recruited over a 15-month period at one lead site (King's College London, UK; clinicaltrials.gov identifier NCT05302167).

Results: Of 123 prospective participants screened, 100 (81%) participants aged 16-74-years (n=69 female) were enrolled, meeting the original recruitment target. Retention of participants from screening (Week 0) to endpoint (Week 15 +/- 2) was 75%, based on completion of the primary outcome measure (Generalised Anxiety Disorder – 7 Item Scale; GAD-7). 66% (n=50) participants self-reported using the app for the full 13-weeks duration (recommended). 16% (n=12) of participants self-reported using the app daily (recommended), with most other respondents (58%, n=44) using the app weekly (from 1-6-days per week). A significant reduction in self-reported anxiety symptom severity pre- vs. post-intervention was identified on the GAD-7 (t(74)=5.63, p<0.001, 95% CI [1.80, 3.77]; d=0.43, 95% CI [0.13, 0.73]).

Conclusions: We have provided the first evidence that an autism adapted app-based anxiety management tool is acceptable to the community and can reduce anxiety symptom severity in autistic adults. Following optimisation to further enhance useability, the efficacy of the Molehill Mountain app for reducing anxiety must now be tested under randomised controlled conditions in a full-scale clinical trial.

415.324 Feasibility of an Ecological Momentary Assessment Intervention for Improving Social Cognition in Autistic and Non-Autistic Adults

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Background:

Low intensity interventions (LII's) for autistic individuals represent a valuable opportunity to increase access to care (Libsack et al., 2022). LII's have targeted a variety of outcomes, from adaptive behavior to language and social skills improvements (i.e. Marro et al., 2019; Popovic, et al., 2020; Shrestha et al., 2013). One potential form of LII posits that ecological momentary assessment (EMA) – participant *in vivo* responding via a smartphone – can be leveraged to improve key outcomes without the use of formalized clinical intervention. However, no work to date has yet examined the feasibility or acceptability of such an intervention approach for autistic individuals.

Objectives:

To assess the feasibility and acceptability of an EMA intervention to improve social cognition in autistic adults.

Methods:

Ninety adults were recruited for a study designed to utilize EMA as an intervention to improve social cognition (Table 1). All participants completed two in person lab visits. During the first lab visit, participants were trained to track social interactions– defined as exchanges lasting longer than 5 seconds. Participants were split into three conditions: Social Emotional Attention (SEA; log the primary emotion of their interlocutor(s)), Social Attention (AA; log the interlocutor(s) hair color), and the passive control (simply log their interactions). Over the course of the seven-day intervention period, participants also received text reminders to complete the form at 9 a.m., 9 p.m., and 10 additional randomized times between the 9 a.m. – 9 p.m. window.

To examine feasibility of the EMA intervention protocol, we calculated utilization (number of interactions logged within 9 a.m. to 9 p.m.); compliance (self-reported percentage of interactions logged *prompted* (with reminders) and *unprompted* (spontaneous); and acceptability (two independent coders reliably coded free responses of participants regarding the number of things they liked and disliked about the study). We conducted three 2 (autism status) x 3 (condition) ANOVAs to examine differences in feasibility as measured by utilization and acceptability (positive and negative). A Repeated Measures ANOVA was then used to investigate group differences of prompted and unprompted compliance.

Results:

Utilization, unprompted compliance, and acceptability of the EMA intervention were high, and were similar across all participants regardless of autism status or condition (see Table 1). However, autism status showed a significant effect on prompted compliance ($F(1, 75) = 4.39, p = 0.04$). While both the autistic and non-autistic groups provided more responses when prompted, the increase in compliance from the unprompted to the prompted condition was greater for the non-autistic group ($F = 4.51, p = .04$; see Figure 1).

Conclusions:

The LII EMA intervention protocol showed strong feasibility for autistic and non-autistic adults, and across conditions. However, the non-autistic group reported a larger increase in compliance when receiving intermittent prompts, suggesting these reminders may provide less benefit to autistic participants. Future researchers should explore alternative approaches beyond prompted reminders at random intervals to increase EMA compliance amongst autistic participants. As this EMA LII protocol appears feasible, the next steps are to examine its impact on key social cognition outcomes.

**415.325** Fostering Reciprocal Friendships for Neurodiverse Youth through Participation in the Summer Treatment Program

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Background:

The Summer Treatment Program (STP) was designed to treat children with Attention-Deficit/Hyperactivity Disorder (ADHD) in a summer camp-like setting, with the overall program goals of improving children's relationships with peers, positive interactions with adults, self-efficacy, and ability to perform well academically in school settings (Pelham et al., 2010). While originally developed to treat children with ADHD, STPs have since been used to treat children with other developmental disabilities as well, including autism spectrum disorders. The STP model incorporates evidence-based intervention components including a comprehensive token economy system, daily report cards (DRCs), and explicit social skills instruction (Chronis et al., 2004). Children with autism spectrum disorders often manifest challenges with social reciprocity, and therefore building and maintaining friendships is an explicit goal of intervention (Chamberlain et al., 2007). Summer camps are a naturalistic setting for children to build social skills and friendships.

Objectives:

The objective of this study is to evaluate the effectiveness of the STP model in supporting the development of robust social networks and friendships for children ages 6-12 with neurodevelopmental disabilities, including autism spectrum disorders, ADHD.

Children as measured by their self-reports of friends, best friends, and non-preferred peers. Additionally, the team aims to examine the extent to which reciprocal friendships may be fostered by participation in the STP intervention.

Methods:

Using child self-report of friendships (Kasari et al., 2007), children (N = 126) were interviewed weekly during their participation a 5-week STP and asked to identify "who they like to hang out with" (friendships), their top three friends, their best friend, and "who they don't like to hang out with" (rejections). Using the reported endorsements, a peer social preference score is developed by considering the number of received friendship nominations and rejections (Coie et al., 1983). Peer social preference scores are then analyzed using R to create graphic representations of reciprocal (and non-reciprocal) relationships. Linear modeling is utilized to examine social network development over time.

Results:

Preliminary results indicate an increase in total outward nominations and inward nominations over time participating in the STP. Additionally, the number of reciprocal friendships (a bidirectional, mutual report of friendship) between participants was positively correlated with time participating in the STP.

Conclusions:

These results suggest that the STP provides neurodiverse children with a unique opportunity to practice social skills and build meaningful peer connections. It is important to note the limitations of the current study. In particular, the present study did not account for gender, race, socioeconomic status, or identifiers other than age and diagnoses when analyzing peer relationships. Additionally, the present study leaves room to further examine other factors and how these may relate to an individual's social network at baseline and over time.

415.326 A Novel Dance Intervention Program for Adults with Developmental Disabilities: A Pilot Randomized Control Trial

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Background:

Physical activity has been shown to provide wide benefits to people of diverse backgrounds and health conditions (1). However, there are relatively few studies examining the impact of physical activity on individuals with intellectual or developmental disabilities. A recent study at UCLA assessing the impact of a dance intervention in children with developmental disabilities showed significant improvement on their motor abilities and positive trends in their social skills (2).

Objectives:

The objective of this study was to determine if a dance intervention is accessible and feasible for adults with intellectual and/or developmental disabilities (IDD) and understand if a dance intervention (Intervention group) leads to improvements in social or quality of life measures when compared to adults in an open recreation service (control group).

Methods:

The study design was a pilot study in which participants were randomized to active and control groups. Eligible participants included male and female adults older than 18 years old, who self-identified as having an intellectual or developmental disability and were registered participants at a community center for adults with neurodevelopmental disabilities. Pre and post intervention data on quality of life were gathered using the Adult Hope Scale, the Lifespan Self-Esteem Scale, the WHOQOL-BREF-ID & DISABILITIES MODULE, and the Perceived Stress Scale. Motor skills were assessed using the Motor Skills Scale, and intellectual and functional abilities were assessed using the Raven's Progressive Matrices and Vineland Interview, respectively. After gathering baseline data, the active group completed 1-hour of dance classes per week for 10 weeks, while the control group participated in a concurrent 1-hour recreational class each week for 10 weeks. All participants then returned to complete the same surveys above. Pre- and post-intervention data were analyzed using R Studio (Version 2023.06.2).

Results:

We recruited and randomized 24 adult participants with intellectual or developmental disabilities (mean age = 31.05, SD = 10.90), who were enrolled in a lifelong learning center for neurodiverse adults, of which 11 individuals participated in the dance intervention class and 9 participated in the control group's recreation class. The average attendance rate was 92.7 % for the active group and 87.8 % for the control group. The active group showed a significant improvement in social skills, as indicated by the Vineland Socialization domain ($\beta = 18.11$, $p = .02$). Additionally, we observed positive trends in the Agency domain (i.e., goal-directed energy) of the Adult Hope Scale (AHS) and in overall satisfaction with health, although these effects did not reach statistical significance.

Conclusions:

Our results indicate that it is feasible to develop and implement a dance intervention program for adults with intellectual or developmental disabilities. Further, we find increase in social skills can be detected after participation in Dance intervention. However, a lack of significant change in other areas (e.g., motor skills, quality of life) coupled with limitations in study implementation suggests further research is needed to determine the full impact of this dance program.



415.327 Help Our Autistic Children to be More Empathic: Comparing the Effectiveness of Human- and Robot-Based Intervention
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Background: Prior studies have shown that autistic individuals lack empathy (e.g. Baron-Cohen & Wheelwright, 2004), which is an ability to understand and share others' feelings (Singer, 2006). Recently, RCT studies demonstrated that Theory of Mind (ToM) training, Early Start Denver Model, and JASPER model improved empathic responsiveness (e.g., Dawson et al., 2010; Goods et al., 2013; Holopainen et al., 2018). However, these intervention studies did not cover different kinds of emotional situations and all components of empathy (cognitive empathy (CE), affective empathy (AE), prosocial behaviours (PB), Watson & Bird, 2020). Besides, prior interventions are mainly conducted by human therapists. However, autistic individuals show deficits in initiating and engaging with humans and maintaining social relations with them (social motivation theory of autism; Chevallier et al., 2012). Additionally, given a particular form of brain hypertrophy, they may be overreactive to the intensive and unpredictable visual, auditory, and/or tactile stimulations when interacting with humans (Intense World Theory; Markram & Markram, 2010). Unlike humans, robots are operated in a predictable manner (Empathising-Systemising Theory, Baron-Cohen, 2009), which may provide autistic individuals with a favourable learning environment.

Objectives: This study aimed to compare the effectiveness of robot-based intervention for all empathy components (CE, AE, and PB) and emotional situations (happy, sad, fear, angry) to human-based intervention and wait-list control. We hypothesized that both robot-(RBI) and human-based (HBI) interventions could improve all empathy components in all kinds of emotional situations, in comparison to wait-list control (WC) (H1), and RBI is as effective as HBI in improving empathic responses (H2).

Methods: 54 Chinese-speaking autistic children (44 males) aged 5-8 (mean=6.56) with verbal IQ above 85 (mean=95.23) were recruited via online advertisement. Figure 1 shows the procedures.

Results: The effectiveness of intervention for each empathy component across different kinds of emotional situations was compared among the three conditions. For CE, there was a significant improvement between pretest and post-tests (time effect), $F(2,98)=4.35$, $p<.015$, $\eta^2=.08$, but the time*condition interaction was not statistically significant, $F(4,98)=.72$, $p<.58$, $\eta^2=.03$, suggesting that the improvement in CE was not significantly different among all conditions. Nonetheless, the exploration into the different emotional situations revealed that children in HBI and RBI improved more than those in WC in the angry situation, $F(6,147)=4.13$, $p<.001$, $\eta^2=.14$. Same as CE, the time effect of AE was significant, $F(2,98)=3.82$, $p<.025$, $\eta^2=.07$. But different from CE, the time*condition interaction of AE was significant, $F(4,98)=2.66$, $p<.037$, $\eta^2=.098$. Children in both HBI and RBI scored higher than those in WC, $ps<.05$, but no significant difference was found between HBI and RBI. Similar to AE, the time effect ($F(2,98)=9.93$, $p<.001$, $\eta^2=.17$) and the time*condition interaction ($F(4,98)=2.67$, $p<.037$, $\eta^2=.098$) of PB were significant. Children in HBI but not RBI scored higher than those WC, $p<.04$.

Conclusions: H1 was partially supported. There was an improvement in CE in all three conditions. RBI and HBI improved AE. HBI but not RBI improved PB. H2 was also partially supported. RBI was as effective as HBI in improving AE but not as effective as HBI in PB.



415.328 A Systematic Review of Implementation Processes and Outcomes of Evidence-Based Interventions for Autistic Students in Schools

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Background: Hume and colleagues (2021) conducted a comprehensive review of studies spanning nearly three decades (1990–2017), identifying 28 evidence-based practices with positive effects for skills such as social skills, communication, behavior, and academic achievement with autistic youth. However, there is a significant gap in research regarding the implementation of these interventions in school settings. Implementation strategy is defined as the methods used to improve on adopting, implementing, and sustaining a practice (Proctor et al., 2013). Building on the previous work, we conducted a systematic review of the articles from Hume et al. (2021) with specific attention to implementation processes of EBPs for autistic children and youth in U.S. public schools.

Objectives: To describe the implementation processes and strategies used by researchers of EBPs in public school settings.

Methods: An initial screening was conducted in studies synthesized by Hume et al. (2021) with the inclusion criteria of taking place in a U.S. public school and within the age range from 6 to 21 years old aligning with the Individuals with Disabilities Education Act (IDEA), Part B. A second round of screening was conducted to exclude studies where the intervention(s) was implemented by researchers rather than school personnel. A final full-text screening was conducted to extract details of implementation strategies.

Results: Of the 933 articles that were identified and reviewed, only 278 (29.8%) were conducted in U.S. public schools. Of those, just 98 (10.5%) involved implementation of EBPs by classroom teachers, peers, or other school personnel. Additionally, many of these studies lacked crucial details about the implementation process, such as the pre-intervention training provided to teachers or staff, who exactly implemented the interventions, how interventions were monitored, and whether the EBPs were maintained or sustained in the school environment. In other words, despite the development of numerous EBPs, very few are being tested in real-world school settings and conditions, and the lack of documented implementation process and strategies makes it difficult to ensure their effective and sustainable use as well as feasibility, appropriateness, and acceptability.

Conclusions: While extensive research has resulted in numerous EBPs for supporting autistic children and youth, their application in U.S. public schools remains limited. The results of our study suggest that school staff are often not the ones delivering the interventions; a small percentage of studies were delivered in school settings; and even fewer detailed the implementation outcomes and the necessary strategies for replicability and sustained success. There is a clear need for more focused research on how to effectively integrate and report these practices into everyday classroom environments - out of clinical or research settings. Without addressing these gaps, the potential benefit of EBPs may not reach the individuals who can benefit from them most.

415.329 Impact of a Co-Designed Solar Science Curriculum on Students' STEM Identity, Confidence, and Career Interest

A. R. Arista¹, W. Martin², A. Grillo-Hill³, J. Valcarcel³, R. Elsayed⁴, K. Melchior⁵, K. Nguyen³, B. Mendez⁴, L. Peticolas³ and L. Cominsky⁵, (1)Center for Children and Technology, Education Development Center, New York, NY, (2)Education Development Center, New York, NY, (3)WestEd, Redwood City, CA, (4)Space Sciences Laboratory, University of California, Berkeley, Berkeley, CA, (5)EdEon STEM Learning, Sonoma State University, Rohnert Park, CA

Background: [Program blinded], a multi-institution collaboration between [blinded], was designed as a pathway to STEM employment for neurodivergent learners. [Program] provides authentic experiences to neurodivergent youth, including co-design of STEM curricula in partnership with high schools serving neurodivergent youth across the US. In preparation for the total solar eclipse across the US on April 8th, 2024, a solar science curriculum was co-designed with partner schools in California in 2023 to include accessible visual guides, slideshows, teaching tips to improve engagement, and hands-on activities to provide multiple pathways for participation. In early 2024, three schools in the path of the total eclipse (two schools in Texas and one in Ohio) implemented a revised version of the curriculum.

Objectives: Evaluation was conducted to assess the accessibility of our solar science curriculum for neurodivergent students and collect feedback on curriculum content and design from students and instructors. Impact of lesson participation on student STEM identity was also evaluated.

Methods: Online surveys were administered to secondary school students whose teachers implemented some or all of the solar science curriculum. A total of 167 complete responses were recorded (171 total). STEM Identity was retrospectively assessed using the Professional Identity Overlap Single Item Measure (PIO-1, Figure 1).

Observations were also conducted at the two schools in Texas. Research team members observed classroom sessions and interviewed students and instructors.

Results: Analysis of student responses to the PIO-1 revealed that students' STEM identity after the lessons ($M = 3.5$, $SD = 1.7$) was significantly greater than before ($M = 2.6$, $SD = 1.6$) the lessons, $t(166) = 9.47$, $p < .01$ with a Cohen's d effect size of 0.55.

Students were asked how the solar science lessons impacted their confidence and interest in solving science mysteries. Most students said that the lessons made them more interested (66%) and more confident (69%). Only 5% said the lesson made them less interested in solving scientific mysteries, and only 3% said it made them less confident.

Students were asked whether the solar science lessons made them more or less interested in STEM-related careers. Just under half (48%) said the lessons made them a little (34%) or a lot more (14%) interested in NASA-related careers. Only 8% said the lessons made them less interested in NASA-related careers.

In interviews, students and instructors highlighted the importance of visual supports and activities included in the curriculum guide and suggested ways to increase engagement even further by including more videos and adding synchronous worksheets for students to complete during lectures.

Conclusions: These findings suggest that [program]'s solar science lessons had a positive impact on students' STEM identity and helped build students' interest and confidence in STEM. Evidence from this evaluation demonstrates the value of investing in the participatory curriculum co-design process with autistic students and their instructors to produce curriculum materials that are engaging, hands-on, and relevant to diverse learners.



Poster Session**416 - Combined Topics II**

May 1st, 2025, 5:30 PM - 6:30 PM - Hall 4A

416.330 Associations between Co-Occurring Psychiatric Conditions, Sensory Processing, and Challenging Eating Behaviors in Autistic Children

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Background: Co-occurring psychiatric conditions, challenging eating behaviors (CEBs), and sensory processing differences are highly prevalent among autistic children (Baraskewich et al., 2021). However, few studies have investigated the interrelationship between these traits within autism. Previous findings have identified correlations between sensory differences and CEBs in autistic children (Page et al., 2021). Independently, the effect of one psychiatric condition on CEB outcomes has been investigated, but the effect of two or more co-occurring psychiatric conditions is not well understood, particularly in autism, attention-deficit hyperactivity disorder (ADHD), and anxiety. Furthermore, the presence of co-occurring psychiatric conditions could affect sensory preferences which may also influence the presentation or severity of CEBs. Ultimately, it remains unknown if different psychiatric profiles of co-occurring conditions, specifically in autistic children, are related to distinct CEBs.

Objectives: (1) Examine associations between co-occurring conditions and caregiver-reported CEBs. Specifically, the overall effect of the diagnostic group on CEB subdomains, as well as the differences between groups for different CEB subdomains. (2) Examine associations between sensory processing profiles and CEB subdomains. (3) Explore how the findings of Objectives 1 and 2 are interrelated by analyzing the joint effect of diagnostic group (from Objective 1) and sensory profiles (from Objective 2) on CEB subdomains by using an interaction term between diagnostic group overall and each sensory subdomain.

Methods: Participants include 97 children aged 4 to 8 years ($M_{age}=71.03$ months, $SD_{age}=14.13$ months; 69.07% male; 77.32% white) from four diagnostic groups: autism only ($n=24$), autism+ADHD ($n=23$), autism+anxiety ($n=19$), and autism+ADHD+anxiety ($n=31$). Eating behaviors and sensory profiles (hyper-responsivity [HYPER] and hypo-responsivity [HYPO]) were measured via caregiver report using selected subdomains from the Children's Eating Behavior Questionnaire (CEBQ; subdomains in Table 1) and Sensory Experiences Questionnaire 3.0 (SEQ-3) respectively. Analyses were run in SAS version 9.4 (SAS Institute Inc.) using general linear models. Covariates included sex, age, and developmental quotient.

Results: Diagnostic group, HYPER and HYPO sensory profiles, and the interaction between diagnostic group and HYPER/HYPO profiles significantly predicted various eating behaviors (Table 1). Marginal associations were found between diagnostic group and emotional overeating ($p=.09$), enjoyment of food ($p=.07$), and emotional undereating ($p=.06$); therefore, group differences were subsequently explored. Pairwise t-tests revealed that, compared to the autism only group: the autism+ADHD group showed heightened food responsiveness ($p=.004$), enjoyment of food ($p=.02$), and emotional undereating ($p=.02$); the autism+anxiety group showed increased emotional undereating ($p=.04$); the autism+ADHD+anxiety group showed higher food responsiveness ($p=.01$), emotional overeating ($p=.02$), enjoyment of food ($p=.04$), and slowness in eating ($p=.03$). No significant results were identified for satiety responsiveness.

Conclusions: These findings highlight the significant role of co-occurring conditions and sensory processing in CEBs among autistic children. Autistic children who have co-occurring conditions, especially ADHD, experience more severe CEBs than those with autism only. Sensory sensitivities influence CEBs in this population as well. Understanding the interaction between sensory processing, CEBs, and co-occurring conditions can help clinicians develop tailored interventions that can significantly improve long-term outcomes for autistic children with challenging eating behaviors.

**Panel Session****- Genetics of Autism Spectrum Disorders: Update**

May 2nd, 2025, 10:30 AM - 12:30 PM - 611-614

Panel Chair: Craig Powell, *Neurobiology, UAB School of Medicine, Birmingham, AL*

This invited panel will provide updates on the role of genetic variants in risk for autism spectrum disorders. Selected experts will speak about identification of rare causal variants as well as increased risk due to common genetic variants or single-nucleotide polymorphisms (SNPs). In addition, attendees will learn about phenotypes and potential therapeutic strategies for select genetic forms of autism spectrum disorders. Learners will come away with a clearer understanding of the genetic architecture of autism spectrum disorders, of gene discovery efforts, and of how such genetic variants can be used to study autism at the individual disorder and molecular pathway levels.

Targeting Genetic Mutations Associated with Profound Autism

J. D. Buxbaum, *Mount Sinai School of Medicine, New York, NY*

Background: Profound autism has been recently introduced as a category within the autism spectrum, recognizing that a significant fraction of individuals with autism will have significant functional needs, including, “24 h access to an adult who can care for them if concerns arise, being unable to be left completely alone in a residence, and not being able to take care of basic daily adaptive needs.” Addressing the needs of individuals with profound autism will need to consider modalities beyond behavioral interventions and adaptive or life skills training, including approaches that address the underlying biology of profound autism.

Over the past 15 years, there have been remarkable breakthroughs in understanding genetic causes of autism, including in individuals with profound autism. These genetic findings highlight the profound heterogeneity in autism and underscore the need for precision medicine to address disabling features of profound autism. Ongoing efforts to use genetic discoveries to identify shared pathways leading to autism have had limited success to date. However, many of the genetic discoveries, particularly those driven by mutations of large effect, present opportunities for gene-targeted therapeutics for these emerging rare genetic disorders.

Objectives: Recent advancements in treating pediatric genetic disorders through gene therapy, antisense oligonucleotides (ASOs), and small molecules provide a roadmap for applying similar approaches to genetically defined autism.

Methods: The Seaver Autism Center and its collaborators have conducted both clinical and preclinical studies on multiple key autism-related genes, including ADNP, DDX3X, FOXP1, and SHANK2/3. Clinical studies help define the phenotypic characteristics associated with mutations in these genes and begin to identify biomarkers that may be useful in assessing disease progression and treatment efficacy. In parallel, preclinical research using cellular and animal models aims to better understand the relationships between genetic mutations, cell biology, systems biology, and behavior. Having developed these foundational tools and clinical insights, we are now exploring multiple paths toward drug discovery and development for rare genetic disorders associated with a high risk of profound autism.

Results: This presentation will include examples of in-depth phenotypic studies, translational research including comparing biomarkers in animal models and human participants, and cellular studies focused on developing screening platforms and validation assays for therapeutic discovery. In addition, this presentation will provide updates on three approaches to gene-targeted therapeutics that are being explored by the Seaver Autism Center and its collaborators, including organoid phenotype-based screens, translational readthrough of premature termination codons, and small molecule targeting of mRNA.

Conclusions: In-depth phenotypic studies of genetic forms of autism along with cellular studies for therapeutic discovery will lead to future gene-targeted therapeutics.

Using Gene-First Approach to the Study of Autism Groups

W. Chung, *Department of Pediatrics, Boston Children's Hospital, Boston, MA*

Background: Autism is heterogeneous. One dimension to increase homogeneity and better understand the biology of the brain and behavior is to genetically stratify individuals and study genetic conditions that manifest autism in some individuals.

Objectives: To study a large number of individuals across a large number of genetic conditions associated with autism to better understand similarities and differences over the life course.

Methods: We began Simons Searchlight 14 years ago and collect data online on 180 genetic conditions associated with autism.

Results: We have studied ~8,000 individuals from around the world and have observed many similarities of delays in development, expressive language challenges, seizures, and autism across conditions. Some medical conditions including gastrointestinal complaints of reflux, diarrhea, and constipation are also common across conditions. Some conditions have unique features that are important to recognize including neurodegenerative aspects or association with cancer. Family meetings of these groups provide opportunities for educating families about research findings and for participants to help educate researchers.

Conclusions: Genetic stratification of autism provides important insights and is now preparing the path for future clinical trials.

Common Variant Discovery in Autism

A. D. Borglum, *Department of Biomedicine-Human Genetics, Aarhus University, Aarhus, Denmark*

Background:

Autism is highly heritable with most of the genetic predisposition residing in common variants. However, while gene discovery efforts in the *de novo* and rare variant space have succeeded in identifying hundreds of risk genes, only a handful of common variants have been identified so far. Major reasons for this are the need for very large GWAS sample sizes to robustly detect the weak risk effects conferred by common variants individually and the extensive clinical and genetic heterogeneity seen across the autism spectrum.

Objectives:

I will present an update on the ongoing autism GWAS meta-analysis by the Autism Workgroup of the Psychiatric Genomics Consortium, including identification of novel loci, tissues and cell-types enriched for common variant risk, and genetic overlap with other phenotypes. I will also present results on dissection of the polygenic architecture across autism subgroups and genetically informed risk prediction of developing cooccurring conditions.

Methods:

GWAS was performed using standard tools for quality control and analysis, primarily applying the RICOPILI pipeline. Functional annotation, genetic correlation, and dissection of common variant architecture across autism subgroups applied standard methods, including e.g. FUMA, LDSC, MiXeR, and multivariate PGS analyses. Prediction of absolute risk for developing cooccurring conditions was done using Cox regression.

Results:

GWAS meta-analysis included twice the number of autistic persons compared to the previous PGC autism GWAS and found 12 significantly associated loci. Early-phase functional annotation of the identified common variant risk found enrichment exclusively in brain, widespread across brain regions, only in neuronal cells, both excitatory and inhibitory neurons.

Univariate Gaussian mixture modelling found that around 10,000 common variants can explain 90% of the SNP-heritability and bivariate analyses quantifying the polygenic overlap irrespective of allelic directional effects revealed extensive sharing of variants with other mental health phenotypes. For instance, >95% of ADHD and schizophrenia risk variants were found to also influence autism predisposition.

Dissection of the polygenic architecture showed distinct profiles for ICD10 diagnostic subgroups as well as for autism with or without cooccurring intellectual disability (ID). Autism without ID showed higher SNP-heritability than autism with ID, and the two subgroups showed different genetic correlations with cognitive traits.

Leveraging longitudinal data on the iPSYCH Danish nationwide population cohort for risk prediction, we found clear separation of risk trajectories for developing co-occurring diagnoses such as ADHD and schizophrenia, depending on the polygenic load of ADHD and schizophrenia common variant risk, respectively. For instance, almost half of autistic individuals with high polygenic scores for ADHD (upper PGS decile) developed ADHD over time, while only 20% of those in the lower PGS decile did.

Conclusions:

Our GWAS with increased sample size revealed novel risk loci, implicating novel candidate genes and informing on the involved biological mechanisms. Significant variation in polygenic architecture was observed across autism subgroups, advancing our understanding of the genetic heterogeneity of autism. Autism subgroups partitioned on their common variant risk load showed distinct risk trajectories for developing co-occurring diagnoses. The latter may inform precision medicine approaches for early diagnosis and treatment of co-occurring conditions in autism.

A Research Agenda for Fulfilling the Promise of Gene Discovery in Profound ASD

M. W. State, University of California San Francisco, San Francisco, CA

Background: Nearly every contemporary review of the genetics and biology of autism spectrum disorders (ASD) begins with some version of a lament that despite more than a decade of remarkable progress, advances at the bench have not yet had a measurable impact in the clinic. In fact, despite now being able to identify specific genes, mutations, cell types, brain regions, biological themes, and developmental time points relevant to ASD, the promise of clinical translational progress based on advances in genetics and neurobiology has not yet been fulfilled, including for the group of individuals now referred to as having “profound autism”. This proposed diagnostic category is provisionally characterized by core features of autism, concurrent moderate or more severe intellectual disability, minimal or absent language, and the need for 24-hour care. While the precise clinical characteristics and diagnostic boundaries of this subset of individuals with ASD continues to be debated and refined, the terminology is useful in helping differentiate this group from the large number of people who do not experience the core symptoms of ASD as a disability.

Presently, approximately a quarter of all those diagnosed with ASD would meet the proposed criteria and, relevant to this presentation, this group is more likely to carry large effect, rare and *de novo* coding mutations and suffer from a range of severe neurodevelopmental phenotypes, including developmental encephalopathy and epilepsy.

Objectives: To make progress in mechanistic treatment via open science, new initiatives, and harnessing basic science advanced to positively impact the lives of those most severely affected by core features of ASD.

Methods: Various multidisciplinary approaches

Results: This presentation will provide a high-level overview of more than a decade of progress in the genomics, transcriptomics, and proteomics of ASD, as well as recent advances in genetic medicine and human neuroscience, and describe how this research across biological scales is coming together to offer new opportunities for the development of mechanism-driven treatments. A related research roadmap will be described for ARIA (Aligning Research to Impact Autism), a philanthropic initiative which aims to create, via collaboration, a dedicated open science ecosystem that will complement existing research efforts, support new initiatives, and harness the full range of promising basic science advances to positively impact the lives of those most severely affected by the core features of ASD as well as by frequently-occurring co-morbid conditions.

Conclusions: This new research initiative is poised to discover novel therapeutics for those challenged with profound ASD.

Virtual Poster Session

103 - Slifka/ Ritvo Innovation in Autism Research Award, Cultural Diversity Research Excellence Award, and Keynote - Dora Raymaker

May 2nd, 2025, 8:30 AM - 10:00 AM - 6ABC

INSAR 2025 Annual Meeting Abstracts

Awards Presentations</p> Slifka/Ritvo Innovation in Autism Research Award Cultural Diversity Research Excellence Award
 <p>Day 2 Welcome Remarks</p> <p>Keynote Presentation - Dora Raymaker = ""Transdisciplinary and Co-Produced Futures in Autism Research."

Slifka/Ritvo Award

J. B. Northrup, *Department of Psychiatry, University of Pittsburgh School of Medicine, Pittsburgh, PA*

General Session

D. M. Raymaker, *School of Social Work, Portland State University, Portland, OR*

Keynote Introduction

D. M. Raymaker, *School of Social Work, Portland State University, Portland, OR*

Keynote

D. M. Raymaker, *School of Social Work, Portland State University, Portland, OR*

Panel Session

207 - Prioritizing Autistic Lived Experiences and Co-Development to Enhance Research Outputs

May 2nd, 2025, 10:30 AM - 12:30 PM - 6B

Panel Chair: Brittany St John, *University of Washington, Seattle, WA*

Discussant: Karla Ausderau, *University of Wisconsin-Madison, Madison, WI*

This panel focused on how the inclusion of stakeholder input and/or co-development with the lived experience community benefits both the research process and product. This panel brings together a diverse set of international investigators who all prioritize community engagement in their research. Each presentation provides insight into community engagement across multiple stages of the research process. Presenters will reflect on the contributions of the lived experience community and how engagement impacted research outcomes include programming and interventions.

Introduction

B. M. St John, *University of Washington, Madison, WI*

207.001 Enhancing Research through Community Engagement: The Power of Inclusion of Researchers with Lived Experience of Intellectual and Developmental Disabilities

H. J. Laufenberg^a, L. Hladik^a, K. K. Ausderau^a, M. Garner^a, E. Kastern^a, A. Caudill^b and J. Capelle^c, (1)University of Wisconsin-Madison, Madison, WI, (2)Masaryk University, Brno, Czechia, Czech Republic, (3)University of Wisconsin - Madison, Madison, WI

Background:

People with intellectual and developmental disabilities (IDD), including autistic adults, are often excluded from the research process even though their inclusion increases the validity of the research and likelihood their priorities are addressed and findings implemented in practice. Studies have found that engagement of individuals with lived experience of disability in all research phases improves data comprehensiveness and interpretation (Bigby et al., 2013; Di Lorito et al., 2017; Hladik, 2024; Kramer et al., 2019). Using community-based participatory research methods such as photovoice provides opportunities to meaningfully include people with IDD as research team members and as engaged participants. This inclusive approach demonstrates the importance of community engagement in producing robust, impactful research outcomes that address community-led priorities (Beighton et al., 2017; Hladik, 2024).

Objectives:

The purpose of this talk is to 1) describe the engagement of community researchers with intellectual and developmental disabilities as integral team members in the research process, and 2) how community-based participatory research methods, specifically photovoice, promote co-creation of equitable research dissemination.

Methods:

Adults with intellectual and developmental disabilities (n=18) participated in photovoice, a participatory action methodology adapted to support the inclusion of adults with intellectual and developmental disabilities. Participants took photos, captioned the images, and participated in focus groups to answer the primary question: What changed in your daily life during the COVID-19 pandemic? Throughout the research process, two co-researchers with lived experience assisted in data collection, analysis, and dissemination. In addition, community members and research participants actively engaged in interpreting results and co-creating materials for inclusive dissemination.

Results:

Researchers with lived experience of IDD were instrumental in shaping the data collection process to meet participant needs to increase opportunity for capturing the depth of participant experiences. They assisted in identifying important context for photos and facilitating member checking. Additionally, they worked with community partners and research participants to determine alternative forms of dissemination such as a photobook to document the breadth of experience of all participants with IDD and policy briefs to support advocacy topics that emerged through the results. The iterative process of engaging community researchers with IDD in multiple phases of the research process ensured that the findings were both accurate and reflective of the participants' lived experiences.

Conclusions:

The results highlight the transformative potential of community engagement and including co-researchers with IDD throughout the research process. This study contributes to the literature that photovoice is an exceptional methodology for the inclusion of people with IDD in research to elevate and share their lived experiences from a first-hand perspective. Reflections from community members and participants revealed that community engagement significantly strengthened the study, leading to more robust and meaningful outcomes. Their contributions were invaluable, offering perspectives that expanded and deepened the research outcomes and dissemination. This engagement highlights the value of involving community members at all stages of the research process, from idea generation to dissemination. The insights and interpretations provided by the community members were critical in shaping the study's findings and ensuring their relevance and impact.

207.002 Engaging in Community-Partnered Research with Autistic Community College Students: A Path Toward Increasing Instructors' Autism Knowledge

S. C. LaPoint¹, G. M. Osborne², K. Massey³, F. Rasnake⁴, M. Fraser⁵ and L. G. Klinger⁶, (1)University of North Carolina-Chapel Hill, TEACCH Autism Program, Carrboro, NC, (2)TEACCH Autism Program; Psychiatry, University of North Carolina, Chapel Hill, NC, (3)TEACCH Autism Program, The University of North Carolina at Chapel Hill, Chapel Hill, NC, (4)TEACCH Autism Program, The University of North Carolina at Chapel Hill, Chapel Hill, NC, (5)School of Teacher Education, Florida State University, Tallahassee, FL, (6)TEACCH Autism Program; Psychiatry, UNC TEACCH Autism Program, Chapel Hill, NC

Background:

Autistic students are increasingly enrolling in institutions of higher education (IHE). Community colleges are witnessing the greatest shift, as 85% of autistic students in IHE attend a 2-year college exclusively or as a bridge to a 4-year university (Roux et al., 2015). Once enrolled, many autistic adults experience challenges (e.g., executive functioning and mental health) related to navigating a new environment (Gurbuz et al., 2019). Furthermore, faculty and staff members in IHE report a lack of knowledge and being ill-equipped to support autistic students within this context (Hu & Chandrasekhar, 2021). Such experiences within IHE can have negative impacts on the academic success of autistic students. To our knowledge, this is the first community-partnered study that asks autistic community college students about their experiences and prioritizes these perspectives to advance instructors' understanding of how to support autistic students.

Objectives:

This study aims to (1) examine recommendations that autistic students have for community college instructors and (2) discuss the process of engaging with autistic community college students as partners throughout the research study.

Methods:

Eleven autistic adults (aged 18-39 years, $M = 22.64$, $SD = 5.80$) who were enrolled in a North Carolina community college participated in the current study (see Table 1 for additional participant characteristics). The research team conducted a 1-hour semi-structured interview over Zoom that included questions about participants' community college experiences and recommendations for instructors to improve the support they provide autistic students. Interviews were audio-recorded and transcribed verbatim. Participant responses were analyzed using Braun and Clarke's (2006) framework for inductive thematic analysis.

Two autistic community college students partnered with our team throughout the study. They supported the development of interview guides, reviewed autistic students' interview responses, and reflected on their own lived experiences to contextualize participant responses.

Results:

Recommendations described by participants revealed the following themes:

Setting expectations and being transparent. Participants described the importance of instructors providing students with clear directions and structure throughout the course to minimize confusion. For example, participants noted that course syllabi should specify weekly topics, assignments, due dates, and grading rubrics.

Bi-directional interactions. Participants highlighted a desire for approachable instructors with whom they felt comfortable initiating accommodation requests and asking for help on assignments. Additionally, some participants noted that instructors should initiate check-ins with students, particularly when they notice concerning changes in the student's behavior (e.g., no longer coming to class).

Familiarization with student needs. Several participants emphasized the need for instructors to review accommodation requests and seek clarification as needed. Further, participants reflected on their experiences with instructors 'forgetting' to provide accommodations that students were legally entitled to. Such experiences resulted in the student having to take exams multiple times and mental health concerns.

Conclusions:

Our preliminary analysis addresses a pressing need for training designed for community college instructors to increase autism knowledge and improve self-efficacy in supporting autistic students. Furthermore, this study demonstrates the importance of partnering with autistic students throughout the research project to ensure that data collection procedures and findings are meaningful to the community.

207.003 The Community Engaged Development of a Highly Acceptable Sensory Modified Hybrid-Protein Nugget to Target Microbiome in Autistic Individuals

B. M. St John¹, C. Mosca², A. Shindler³, S. Smilevska⁴, C. M. Brown⁵, G. Moschonis⁶, R. Belski⁶, A. Franks⁶, M. Doblin⁷ and A. E. Lane⁸,

(1)University of Washington, Seattle, WA, (2)CSIRO, Werribe, VIC, Australia, (3)Department of Microbiology, Anatomy, Physiology, & Pharmacology, La Trobe University, Melbourne, VIC, Australia, (4)Department Sport, Exercise and Nutrition Sciences, La Trobe University, Melbourne, VIC, Australia, (5)Olga Tennison Autism Research Centre, La Trobe University, Bundoora, VIC, AUSTRALIA, (6)La Trobe University, Melbourne, VIC, Australia, (7)La Trobe University, Melbourne, VIC, Australia, (8)Olga Tennison Autism Research Centre, La Trobe University, Melbourne, VIC, Australia

Background:

Up to 85% of autistic children have significant feeding challenges impacting their diet variety, health, and development (Leader et al, 2020). Food selectivity based on the sensory properties of the food is the most reported feeding challenge among this population (St. John & Ausderau, 2024; Sharp et al., 2013). Due to their highly selective diets, many autistic children have significant nutrient deficiencies (Hyman et al., 2012; Sharp et al., 2012). In addition, autistic children have disrupted gut microbiome that has been associated with autism characteristics and development (Iglesias-Vázquez et al., 2020). Food innovators have an opportunity to create products that cover known nutritional gaps, enhances the diversity of the gut microbiome, and are aligned with the preferences and desires of the autism community. Newly developed sensory acceptable food products may offer autistic individuals with selective eating an enjoyable food source to fulfill nutritional deficits in their diet. Evaluation of the community acceptability of any developed product is an essential outcome to consider in the product development process.

Objectives:

The purpose of this pilot project was to develop and evaluate the consumer acceptability of a new nutritious food (hybrid-protein nugget) specifically designed for sensory acceptability by individuals with autistic feeding challenges.

Methods:**Nugget development:**

A collaborative research project was developed between the Olga Tennison Autism Research Centre and members of the La Trobe Institute for Sustainable Agriculture and Food (LISAF) and Commonwealth Scientific and Industrial Research Organisation (CSIRO)'s Agriculture and Food unit. Previous work from La Trobe's research team had captured the perceptions of the lived experience community related to the sensory underpinnings of feeding challenges and the acceptability of sensory modifications of foods. Building on the findings from the lived experiences community study, a new frozen nugget with a hybrid protein (texture variable protein and chicken) composition was developed. Sensory properties of the nugget were modified to align with the communicated preferences from the lived experience community. The nugget was specifically formulated to target microbiome composition when consumed regularly.

Consumer acceptability

Autistic individuals with feeding challenges (n=10) and families of autistic children with feeding challenges (n=5) were invited to trial the developed nugget in their homes and provide ratings of acceptability.

Results:

The developed nugget was highly acceptable with a mean enjoyment rating of 8.25/10 among autistic individuals and 9/10 among families. Families of autistic children with feeding challenges reported the nugget was accepted by 80% of the children. Acceptance of a novel food when first offered is rare among children with feeding challenges. Qualitative reactions and comments included complimentary comments on the nugget texture, smell, and flavor. 80% of families and individuals endorsed that they would purchase the nugget if available in the grocery store. Price was listed as an important factor in deciding to purchase.

Conclusions:

The developed nugget was highly acceptable and enjoyable to both families and autistic individuals. Lived experience community input was essential in the development of the product and evaluating the acceptability of the product.

207.004 Refinement and Feasibility of a Pilot Volunteer Program for Autistic Adults

M. L. Cook¹, H. Loeb², E. M. Lamarche³ and L. G. Klinger³, (1)TEACCH Autism Program, UNC Chapel Hill, Carrboro, NC, (2)Psychiatry, UNC TEACCH Autism Program, Chapel Hill, NC, (3)TEACCH Autism Program; Psychiatry, UNC TEACCH Autism Program, Chapel Hill, NC

Background:

Volunteering is positively associated with mental and physical health (Yeung et al., 2017), social support, employment skills (Proulx et al., 2018), and quality of life (Willigen, 2000) in the general population and may provide meaningful benefits for autistic adults as well. Stakeholder feedback is necessary to confirm the perceived value of a pilot volunteer program and provide feedback on accessibility and feasibility.

Objectives:

To develop and pilot a structured volunteer program for autistic adults (TEACCH Autism Gives, TAG) by 1) refining development with stakeholder feedback, 2) assessing feasibility, and 3) using a mixed methods approach to examine the impact of participation on autistic adults' experience of community participation, self-determination, and social engagement.

Methods:

Phase 1: Semi-structured stakeholder interviews were conducted with autistic adults to gauge value, feasibility, and feedback on draft program materials (n=15, ages 19-56, 53% male). Interviews were recorded, transcribed, and analyzed in Dedoose utilizing Braun and Clarke's reflexive thematic analysis approach. Resulting themes were used to refine materials and pilot design.

Phase 2: Autistic adults (n=12, ages 19-55, 75% male, mean FSIQ=103.2) were matched with a local volunteer site (n=4) and volunteered for 3-5 hours per week for 9 weeks. Site supervisors (n=6) completed a brief training with the study team on best practices for supporting autistic volunteers and all participants received the TAG handbook (a compilation of visual supports adapted from the TEACCH School Transition to Employment and Post Secondary Education Program). Autistic adults completed pre and post GPS tracking using Optimus 3.0 devices as well as self-report measures of community participation, self-determination, and social engagement. Site supervisors completed post measures of feasibility, acceptability, and appropriateness (see Table 1). ArcGIS software was utilized to calculate activity space and map GPS data (Figure 1), while self-report data is currently presented as descriptive means given the small sample size.

Results:

Stakeholder interviews revealed themes across three primary domains: barriers to volunteering (e.g., anxiety, logistical burden, competing demands, lack of access, unpleasant sensory experiences, wariness of negative social experiences), benefits of volunteering (e.g., community connection, engagement with interests, getting out of the house, sense of empowerment, feeling good when helping others, skill acquisition), and facilitators of successful volunteering (e.g., clear visual expectations, accommodations, supportive supervisors, and social support). Outcome data is currently available for 78% of the sample (n=10 autistic adults, n=4 supervisors) with additional data continuing to be collected. Initial analyses suggest high feasibility ratings amongst site supervisors, high satisfaction amongst participants, and improvements in the domains of community participation and self-determination (decision-making) for the majority of the sample (see Table 1).

Conclusions:

The inclusion of stakeholder feedback prior to the launch of the pilot was essential in tailoring materials to better meet the needs of the autistic community. Preliminary pilot data suggests that 1) participation in TAG provided both a meaningful and feasible opportunity for community participation and 2) a larger scale implementation is warranted to explore efficacy.

**Panel Session****208 - Not Autism. Not Yet. Characterizing the Diagnostic Experiences and Profiles of Late, Missed and Mis-Diagnosed Individuals.**

May 2nd, 2025, 10:30 AM - 12:30 PM - 6C

Panel Chair: Clare Harrop, *Department of Allied Health Sciences, University of North Carolina - Chapel Hill, Chapel Hill, NC*

Discussant: Somer Bishop, *Psychiatry and Behavioral Sciences, University of California, San Francisco, San Francisco, CA*

For many years, the field of autism research has focused on early identification and diagnosis (Gordon-Lipkin et al., 2016). Earlier diagnosis and access to interventions are associated with positive outcomes in cognitive functioning, daily living, and other areas of development (e.g. Gabbay-Dizdar et al., 2022). Further, a timely diagnosis is associated with self-identity and belonging (e.g. Oredipe et al., 2023). However, there has been an unprecedented rise in people diagnosed with autism outside of early childhood, including a disproportionate number of people assigned female at birth and gender diverse individuals. The overarching goal of this panel is to showcase diverse research spanning childhood through adulthood to capture the diagnostic experiences and profiles of autistic people diagnosed late or initially diagnosed with a condition other than autism. Talks will span diagnostic stability, methods developed to capture those diagnosed in adolescence and adulthood, and the profiles of children entering studies without a formal autism diagnosis, covering the complexity and breadth of late-, missed- or mis-diagnoses. Our panel includes multiple levels of analysis (qualitative, mixed methods, quantitative), diverse samples (over-represented for assigned sex, gender diversity, and racial and ethnicity minorities), and speakers across career stages (post-bac, postdoc, early career faculty, and tenured faculty).

Introduction

C. Harrop, *Department of Allied Health Sciences, University of North Carolina - Chapel Hill, Chapel Hill, NC*

208.001 Why the Wait?: Phenotypic Differences in 4- to 8-Year-Old Children with Suspected Vs. Confirmed Autism

A. L. Lee¹, **M. Lyons²**, **T. McFayden³**, **S. Schillinger⁴**, **L. J. Fulop⁵**, **J. S. Miller⁶**, **C. Faulk¹**, **R. Grzadzinski²**, **H. Hazlett¹**, **J. F. Strang³**, **C. Harrop⁶** and **J. Parish-Morris¹**, *(1)Center for Autism Research, Children's Hospital of Philadelphia, Philadelphia, PA, (2)University of North Carolina at Chapel Hill- Carolina Institute for Developmental Disabilities, Chapel Hill, NC, (3)Carolina Institute for Developmental Disabilities, Carolina Institute for Developmental Disabilities, Chapel Hill, NC, (4)University of North Carolina, Chapel Hill, NC, (5)Gender and Autism Program, Children's National Health System, Washington, DC, (6)Department of Allied Health Sciences, University of North Carolina - Chapel Hill, Chapel Hill, NC*

Background: Autistic children and families face multiple barriers to participating in scientific research (Lee et al., 2024). One significant barrier includes the common requirement that children have a confirmed autism diagnosis prior to study enrollment (Shaia et al., 2019), which excludes many autistic children who receive a delayed diagnosis (considered after the age of 4; Zuckerman et al., 2017). Prior research suggests that people with complex psychiatric and/or neurodevelopmental profiles tend to receive later diagnoses (Wodka et al., 2022), as do females and individuals who are gender diverse (McQuaid et al., 2024). To replicate and extend these findings in a younger cohort followed longitudinally, we examined phenotypic differences in 4- to 8-year-old participants who entered a multi-site study as potentially autistic (TBD group, i.e., caregivers and other informants expressed concerns about the child having autism, but they had not yet received a formal diagnosis) vs. children who enrolled in the study with an established autism diagnosis (Dx group). Based on prior research, we hypothesized that children in the TBD group would be characterized by greater gender diversity than the established Dx group (McQuaid et al., 2024) and that TBD females would have more complex psychiatric/neurodevelopmental profiles than Dx females (Wodka et al., 2022).

Objectives: (1) Compare rates of gender diversity and (2) examine sex differences in psychiatric and neurodevelopmental profiles in children who came into the study with an autism diagnosis (Dx group), vs. children who received their diagnosis as part of study participation (TBD group).

Methods: 132 autistic 4- to 8-year-olds were grouped based on whether they entered the study with an autism diagnosis (Dx;n=106) or received a diagnosis as part of study participation (TBD;n=26). Rates of parent-reported child gender diversity were compared using Fisher's exact test. To assess psychiatric/neurodevelopmental characteristics in Dx and TBD children, Child Behavior Checklist (CBCL; Achenbach 1999) scores were compared in a smaller subsample matched on age, IQ, and assigned sex at birth (n=44;26F). Data normality was assessed using Shapiro-Wilk tests, followed by either two-sample t-tests or Wilcoxon signed-rank tests to compare CBCL scores between groups.

Results: TBD children were significantly more likely to be gender diverse than Dx children ($p=0.017$, odds ratio=0.176, 95% CI [0.032,0.888]). Parents of TBD females reported elevated symptoms of anxiety ($p=0.030$, Cohen's $d=2.20$), attention deficit hyperactivity disorder (ADHD; $p=0.044$, Cohen's $d=2.11$) and oppositional defiant disorder (ODD; $p=0.032$, Cohen's $d=2.23$) compared with Dx females. ODD symptoms were significantly greater for TBD females compared to TBD males ($p=0.035$, Cohen's $d=2.28$). There were no observed differences in CBCL scores between TBD and Dx male groups (all $p=ns$).

Conclusions: Children with complex behavioral profiles, specifically females and gender diverse individuals, may be at elevated risk of delayed diagnosis. This could lead to missed opportunities for specialized intervention and care, and potentially contributes to poorer long-term mental health outcomes. The current study is among the first to examine early developmental differences in autistic children longitudinally and will continue to explore outcomes during this critical developmental window to better inform diagnostic and treatment strategies.



208.002 Clinician Confidence over Time in a Sample of Children at High-Familial Likelihood for ASD

C. A. Burrows¹, R. Grzadzinski², K. E. Caravella³, T. St. John⁴, J. Pandey⁵, N. Marrus⁶, C. M. Lee⁷, C. Lasch⁸, M. Mosner⁹, A. Jones¹⁰, K. Mata¹¹, J. R. Pruett¹², A. M. Estes¹³, S. R. Dager¹⁴, R. T. Schultz¹⁵, L. Zwaigenbaum¹⁶, J. Piven¹⁷ and H. Hazlett¹⁷, (1)Department of Pediatrics, University of Minnesota, Minneapolis, MN, (2)Carolina Institute for Developmental Disabilities, Carolina Institute for Developmental Disabilities, Chapel Hill, NC, (3)Carolina Institute for Developmental Disabilities, University of North Carolina, Chapel Hill, NC, (4)University of Washington, Seattle, WA, (5)Center for Autism Research, Children's Hospital of Philadelphia, Philadelphia, PA, (6)Washington University in St. Louis, St. Louis, MO, (7)Department of Pediatrics, University of Minnesota - Twin Cities, Minneapolis, MN, (8)Institute of Child Development, University of Minnesota, Minneapolis, MN, (9)Children's Hospital of Philadelphia, Philadelphia, PA, (10)University of Minnesota, Minneapolis, MN, (11)UNC Carolina Institute for Developmental Disabilities, Carrboro, NC, (12)Washington University School of Medicine, St. Louis, MO, (13)Speech and Hearing Sciences, UW Autism Center, Seattle, WA, (14)Radiology, University of Washington, Seattle, WA, (15)The Center for Autism Research/CHOP, Philadelphia, PA, (16)University of Alberta, Edmonton, AB, Canada, (17)University of North Carolina, Chapel Hill, NC

Background: Autism spectrum disorder (ASD) is historically considered to be a lifelong, pervasive neurodevelopmental disorder. Recent work highlights variability in diagnoses over time (Harstad et al., 2023) and varying clinician confidence in diagnoses (Klaiman et al., 2022; McDonnell et al., 2019). Siblings of autistic children are at higher likelihood for ASD, though their presentations may be milder (Micheletti et al., 2019), and they hover near the diagnostic boundary (Tunc et al., 2021). No studies to date have examined clinician confidence over time in a sample of children at high-familial likelihood for ASD (HL).

Objectives: To examine rates of clinician confidence in diagnosis over time and whether the sex of the child moderates clinician confidence.

Methods: HL participants with an older autistic sibling enrolled in the Infant Brain Imaging Study (IBIS; N=422, 39% female, 84% White, 93% Non-Hispanic) received clinical best estimate (CBE) diagnoses of ASD or non-spectrum (NO ASD) at 24 months, 36 months, and school-age (7-11 years) by clinicians expert in autism diagnosis. Clinicians also rated their confidence in their diagnostic impression on a scale of 1 (not at all confident) to 3 (very confident), which was dichotomized to high or low confidence.

Results: Clinicians had low confidence in their CBE determinations for 32.4% of 24-month visits, 23.4% of 36-month visits, and 20.5% of school-age visits (Table 1). In cases of diagnostic uncertainty, there were sex differences in the diagnosis assigned at 24 months, chi-square=4.01, $p=.045$, where females were more likely to receive a CBE of NO ASD (72.5% of girls), whereas boys had a more even split (53.8% of boys received a CBE of NO ASD). There were no sex differences in diagnosis assigned in cases of uncertainty at 36 months or school-age ($p>.05$). When examining clinician confidence in CBE's over time (Figure 1), 57.0% of participants were rated as NO ASD with high confidence at 2 or more visits, and 6.7% of participants were rated as ASD with high confidence at 2 or more visits. Conversely, there were 15.8% of participants where clinicians had low confidence in their CBE's at 2 or more visits. Reasons listed for diagnostic uncertainty include variability in mood or behavior on the day of testing, discrepancy between parent report and clinician observation, and clinician reports of both strengths and weaknesses in symptom domains of ASD.

Conclusions: Results highlight the high proportion of both high and low confidence in CBE over time in HL samples. Clinician confidence increased as children aged, but clinicians had low confidence in a substantial portion of the school-age HL children. For young children, when clinicians had low confidence in their CBE, they were more likely to rate females as NO ASD compared to males. This difference was not present as children aged. There is a variety of reasons why clinicians may have low confidence in their CBE impressions, which may change as children age. Implications for understanding the etiology of ASD will be discussed, as well as implications for repeated assessments of ASD over time and interventions.



208.003 Pathways to an Autism Diagnosis: Insights from Parents of Females

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Background: Females receive autism diagnoses significantly later than males, contributing to delayed access to supports (Kavanaugh et al., 2021). Reasons for diagnostic delays include child-level characteristics, including difficult differential diagnoses (Belcher et al., 2023), masking/camouflaging (Hull et al., 2020), or social strengths/atypical autistic phenotypes (Ratto et al., 2018), in addition to provider characteristics, including lack of knowledge about the female autism phenotype (Hiller et al., 2016). Person- and society-level characteristics intersect with racial/ethnic status, which can further delay access to a timely autism diagnosis (Fombonne & Zuckerman, 2022). Understanding barriers to, and pathways towards, an autism diagnosis is crucial to lowering the average age of diagnosis for females, particularly those from minoritized backgrounds.

Objectives: This study sought to quantitatively and qualitatively characterize the diagnostic pathway from parental first concern to an autism diagnosis for autistic females.

Methods: Caregivers enrolled in SPARK Research Match were contacted to complete a survey about their child's diagnostic pathway. The sample was over-recruited for caregivers of racial/ethnic minorities and females. The final sample comprised N=158 caregivers (n=90 with female children). Caregivers were largely college-educated (70%). Child average age was 9.48 years ($SD=4.86$, range=2.6-17.8 years). Youth were 78% not Hispanic and 36% White, 32% Multiracial, 16% Black, 8% Asian, and 5% another or an unspecified race. Parents reported an average age of diagnosis of 3.86 years ($SD=2.6$). Males and females did not differ on relevant demographic variables.

Results: Largely, quantitative results did not indicate many sex differences in diagnostic pathways. Males and females did not significantly differ on age of first concerns, $p=.667$ or age of diagnosis, $p=.969$. Males and females were equally likely to receive a diagnosis prior to autism, $\chi^2=3.609$, $p=.057$; no significant differences emerged in the type of prior diagnosis. Females received significantly more prior diagnoses than males ($M_{females}=2.11$, $M_{males}=1.69$), $t(65.817)=1.673$, $p=.05$. When bringing their concerns to their primary care physicians, parents of White females were more likely than parents of White males to be told that their child will "grow out of" their autistic behaviors, $\chi^2=3.745$, $p=.05$. Lastly, parents of females reported receiving autism diagnoses primarily from clinical psychologists (46%), whereas parents of males reported receiving diagnoses from a wider range of providers, and primarily from pediatricians (36%). Qualitatively, although age of diagnosis of males and females were not significantly different, parents of females reported many more inflection points and barriers on their diagnostic journey, including requiring consistent advocacy efforts. Parents of females also reported greater frustration, dissatisfaction, and perseverance required to arrive at an autism diagnosis compared to parents of males.

Conclusions: On the surface, autistic males and females reached equivalent diagnostic milestones. However, results from qualitative data revealed significant sex differences in diagnostic pathways, with parents of autistic females reporting more previous diagnoses, seeing more professionals, dismissive professional responses, and themes related to frustration, perseverance, and barriers that were notably absent for parents of autistic males. These results highlight the importance of mixed methods research, with implications for understanding how autistic females are missed or later-diagnosed.

208.004 Centering the Inner Experience of Autism: Preliminary Psychometrics and Validation of the Self-Assessment of Autistic Traits

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Background:

Current tools for identifying autistic traits may lack sensitivity and specificity, especially in autistic people who are older, use compensatory strategies, are cis-gender girls or women, or are gender-diverse. Helping address this gap is the Self-Assessment of Autistic Traits (SAAT; Ratto et al., 2022), the first comprehensive self-report tool of autism traits for teens and adults written under the leadership of autistic people. SAAT items are designed to represent the internal experience of autism using strength-based, accessible language.

Objectives:

Evaluate preliminary psychometrics of the SAAT item pool; use pilot MRI data gathered from a subset of autistic survey respondents to explore the biological underpinnings of a novel factor (Brain-Body Disconnect) identified in the SAAT.

Methods:

We administered the SAAT item pool (58 items) to autistic ($N=500$; 48% female, 36% male, 5% nonbinary gender), and non-autistic ($n=80$) people ≥ 16 y from two samples (online community-based, autistic $N=440$; ACE-GENDER Network; autistic $N=60$, non-autistic $n=80$). 197 autistic people and 52 non-autistic people also completed the Social Responsiveness Scale-2 (SRS-2).

MRI methods. We analyzed resting-state fMRI data from $N=17$ autistic respondents who completed the SAAT during Wave 2 of ACE-GENDER Network project. Based on item content (e.g., "I can't always do what I need to do, because it feels like my mind and my body are disconnected"), we hypothesized striatal/basal ganglia involvement, as this system is associated with action selection and motor function. Using ICA + dual regression (Kohn et al., 2017), we identified group-level independent components (ICs) in the resting-state data, then selected the IC most highly correlated with a reference executive/striatal network (Smith et al., 2009). Dual regression was then used to test for associations between Brain-Body Disconnect factor scores and individual network parameter estimates (10,000 permutations; threshold-free cluster enhancement; corrected $p < .05$).

Results:

Exploratory factor analysis followed by a unidimensional confirmatory factor analysis revealed four factors: Modulation/Social Communication, Strengths/Passions, Brain-Body Disconnect, and Negative Community Context. Three of these factors are sensitive to autism across age, gender identity, assigned sex at birth, and gender diversity status, and moderately to strongly correlated with the SRS-2 Total score.

MRI results. The group-level IC most strongly correlated with the reference network was largely comprised of bilateral dorsolateral prefrontal cortex. Brain-body Disconnect scores were positively associated with subject-level parameter estimates in right globus pallidus ($x=25, y=-15, z=-5$; $p=.014$); Figure 1.

Conclusions:

The SAAT item-set has promise as a multi-dimensional self-report tool that is reliable and valid with respect to the samples examined, which included female gender, gender-diverse, adult, and nonspeaking individuals. It captures novel aspects of the inner experience of autism, enhancing its promise as a sensitive screening measure and revealing possible new autism phenotypes. The globus pallidus is a component of the basal ganglia that inhibits motor system action. Disrupted signaling between prefrontal cortex and basal ganglia is known to interfere with task switching in other conditions involving action initiation difficulties, such as Parkinson's. Our finding of increased pallidum involvement in a prefrontal network among individuals reporting greater Brain-Body Disconnect suggests a potential biological mechanism for reported difficulties.

**Panel Session****209 - Does Wiring Matter? Dynamic Connectivity and Excitation/Inhibition Imbalance in Autism Neuronal Network**

May 2nd, 2025, 10:30 AM - 12:30 PM - 6A

Panel Chair: Yeni Kim, Dongguk University, School of Medicine, Goyang, Gyeonggi, Korea, Republic of (South)

Recent advancements in dynamic connectivity, show that the human brain is a complex nonlinear system comprising multiple interacting components. Autism spectrum disorder (ASD) encompass a wide range of heterogeneous conditions, however the atypical balance between cortical excitation and inhibition (E/I) is a hallmark proposed as the etiology of ASD. However, mechanisms contributing to dynamic connectivity aberration and cortical E/I imbalance in ASD brain is still under investigation. This panel brings together four talks aimed at exploring dynamic connectivity and excitation/inhibition imbalance in neuronal network of Autism individuals. First talk explores conflicting findings in the field and support a developmental reconceptualization of the E/I imbalance theory of autism. The second presentation examines dynamical complexity in ASD neurons during differentiation, using the electrical recordings of stem cell-derived neurons. The third presentation uses aperiodic exponent of the EEG power spectrum as an indicator of E/I balance highlighting significant neurophysiological differences between autistic and NT children. Finally, the fourth presentation performs dynamic connectivity analyses in a unique transdiagnostic sample of school-age children assessed for both ADHD and ASD. These presentations advance our field by exploring abnormality in neuronal network specifically dynamic connectivity and excitation/inhibition imbalance, establishing new endophenotypic target for ASD.

Introduction

Y. Kim, Child and Adolescent Psychiatry, Dongguk University International Hospital, Seoul, Korea, Republic of (South)

209.001 Developmental Excitation/Inhibition Imbalance Disrupts Social Circuit Function Via Activity Dependent Transcriptional Remodeling

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Background:

Autism and related developmental disorders encompass a wide range of heterogeneous conditions with an overall prevalence of 1 % in the human population. Although autism varies in symptomatology and severity, its two main core symptom domains (i.e. social and communicative impairment, as well as restricted and repetitive behaviors) appear to be consistently affected across the spectrum. However, how diverse etiological mechanisms converge to produce the relatively narrow set of behavioral and etiopathological manifestations that characterize autism remains unclear. A popular theory posits that an imbalance between excitatory and inhibitory (E/I) activity might contribute to the etiology of autism. However, controversy exists about whether E/I imbalances observed in animal models and clinical populations causally contribute to autism pathology or are instead a compensatory or epiphenomenal phenotype.

Objectives:

To reconcile these views, here we test the hypothesis that transient E/I imbalance during early development is sufficient to alter the developmental trajectory of the brain, leading to lasting autism-relevant phenotypes.

Methods:

Cell-type specific increase of neuronal excitability was obtained with the use of intersectional genetics to express excitatory DREADD receptors in Vglut1-cre mice and the following chronic CNO treatment during the first two postnatal weeks. Longitudinal behavioral tests, RNA sequencing, electrophysiological measurements and resting state fMRI were performed at multiple developmental stages (late infancy, adolescence and adulthood).

Results:

We find that chemogenetically-induced E/I imbalance in the mouse neocortex during early development leads to permanently impaired sociability but largely preserved cognitive and motor-sensory functions. Corroborating the developmental specificity of these results, control studies in which the same manipulation was applied to adolescent mice did not result in any behavioral alteration. Social alterations are associated with transcriptional dysregulation of autism-risk ion channels and synaptic genes, thus putatively implicating activity-dependent transcriptional mechanisms in the generation of the observed phenotypes. Transcriptomic dysregulation furthermore resulted in enduringly altered electrical properties of pyramidal neurons, suggesting altered maturation of principal neurons. Circuit level investigations in adult mice using resting state fMRI show that developmental E/I imbalance profoundly disrupts functional connectivity in limbic fronto-hippocampal components of the social brain but preserved coupling in sensory regions. Notably, hypoconnectivity of prefrontal regions with dopaminergic nuclei is also highly predictive of social disruption in manipulated animals.

Conclusions:

Our results, reconcile conflicting findings in the field and support a developmental reconceptualization of the E/I imbalance theory of autism whereby developmental changes in E/I are sufficient to produce autism-related phenotypes via epigenetic dysregulation of autism-relevant synaptic genes.

209.002 Attention Entropy Measures Dynamic Complexity during Differentiation in iPSC-Derived Neurons from Autism Individuals

Y. Kim¹, Y. Choi¹, K. T. Park², S. H. Yi² and R. Santos³, (1)Dongguk University, School of Medicine, Goyang, Gyeonggi, Korea, Republic of (South), (2)Inje University, Gimhae, South Gyeongsang, Korea, Republic of (South), (3)Université Paris Cité, Institute of Psychiatry and Neuroscience of Paris, Paris, Paris, France

Background: The human brain is a complex nonlinear system comprising multiple interacting components at a variety of spatiotemporal scales. Neuronal activity can be modeled as a nonlinear dynamical system to yield measures of neuronal state and dysfunction. Previously, we reported a significant reduction in dynamical complexity in autism spectrum disorder (ASD) neurons during differentiation, using the electrical recordings of stem cell-derived neurons from individuals with ASD and controls (Amatya et al., 2019). In this study, Attention Entropy (AttnEn), initially proposed for assessing heart rate variability through the distribution of positional differences between extrema in interbeat intervals (IBIs), was adapted to analyze interspike intervals (ISIs) allowing real-time computation of AttnEn with linear time complexity.

Objectives: Our study aimed to investigate whether (1) AttnEn successfully differentiated the neural activity of ASD-derived neurons from that of controls and (2) dynamical analysis as a paradigm can be used to distinguish cellular electrophysiological and transcriptional signatures in disease-associated drug response.

Methods: Eight iPSC lines derived from ASD patients with an early brain overgrowth phenotype and seven age-matched neurotypical control lines from Marchetto et al. (2017) were analyzed. We performed RNA sequencing on iPSC derived neuronal progenitor cells at 15 days post differentiation. Gene ontology (GO) analysis was performed to determine which biological pathways were associated with differentially expressed genes. Raw signals recorded from microelectrode arrays (MEAs) were used to compute AttnEn for evaluation of neural activity between neurons derived from ASD patients and healthy controls.

Results: AttnEn successfully differentiated the neural activity of ASD-derived neurons from that of control, with ASD neurons exhibiting significantly lower entropy. This reduction in AttnEn suggests a diminished complexity in the neural firing patterns of ASD-derived neurons, reflecting potential deficits in neuronal communication and network maturation associated with the disorder. Furthermore, upon administration of risperidone, a drug frequently used to control behavioral symptoms in ASD, the AttnEn values in ASD neurons showed a notable increase, approaching those observed in the control group. Next, the gene expression signature of the AttnEn was examined in relation to Risperidone treatment. RNA sequencing data showed that the genes regulating synaptic vesicle cycle, postsynapse, transmission across chemical synapses, axon development, synaptic signaling, microtubule, and BDNF signaling pathway showed correlation with AttnEn changes observed with Risperidone treatment, suggesting that Risperidone contributed to restoring the complexity of neural activity and strengthening of the neural network. These findings implicate that dynamic electrical complexity of neural network measured using AttnEn is sensitive not only in detecting underlying differences in neural activity but also in monitoring the efficacy of pharmacological interventions.

Conclusions: AttnEn, a marker for dynamic neuronal complexity, is sensitive to drug treatment underscoring its potential as an endophenotypic target for evaluation of therapeutic agents. We present further evidence supporting dynamical analysis as a paradigm that can be used to distinguish disease-associated cellular electrophysiological and transcriptional signatures in neuropsychiatric disorders.

209.003 Aperiodic Activity EEG Measures Predict Executive Function in Kindergarteners with and without Autism

S. Jeong¹, A. B. Choi², Y. Braverman³, S. Faja⁴ and S. H. Kim¹, (1)School of Psychology, Korea University, Seoul, Seoul, Korea, Republic of (South), (2)Korea University, Seoul, Korea, Republic of (South), (3)Neurology, Boston Children's Hospital, Brookline, MA, (4)Boston Children's Hospital, Harvard, Boston, MA

Background: Executive function (EF) skills vary widely among autistic individuals, yet the underlying mechanisms of these differences, especially in early childhood, remain poorly understood. One key factor may be the atypical balance between cortical excitation and inhibition (E/I balance), a hallmark proposed in autism spectrum disorder (ASD). EEG spectral power, which is often altered in autistic children, has been linked to EF, but traditional EEG methods do not fully capture the complexity of E/I balance. Recent advancements, such as the aperiodic exponent of the EEG power, offer a more refined approach by serving as a proxy for E/I balance (Gao et al., 2017; Leno et al., 2022; Ostlund et al., 2022). This method allows researchers to better understand how shifts in cortical dynamics may influence cognitive processes like EF in young autistic children, providing new insights into their neurodevelopment.

Objectives: Our study aimed to (1) investigate whether autistic children show differences in aperiodic slopes when compared to neurotypical (NT) peers, and (2) examine whether the aperiodic slopes are associated with EF skills across both autistic and NT children.

Methods: A total of 52 kindergarteners (n=29 ASD, n=23 NT cases) completed a 5-minute baseline, resting-state EEG task. Both groups had fluent speech (i.e., complex sentences) and were cognitively-able (NVIQ scores above 80). The aperiodic exponent of the EEG power spectrum, calculated using SpecParam (Donoghue et al., 2020), was used as an indicator of E/I balance (e.g., with a steeper slope reflecting greater cortical inhibition relative to excitation). EF skills were measured using the EF Touch (Willoughby et al., 2010), a computerized task administered on a touch-screen tablet, which assesses multiple EF domains including attention shifting, working memory, and inhibitory control. Using multiple linear regressions, we examined whether children's diagnostic group (ASD vs. NT) predicted aperiodic exponents and explored the associations between aperiodic exponent and EF. All analyses accounted for age, sex, and cognitive ability.

Results: (1) Children's diagnostic group (ASD vs. NT) was significantly associated with the aperiodic slopes in both the frontal cluster, $B=-.09$, $SE=.04$, $p=.04$, and the midfrontal cluster, $B=-0.11$, $SE=.04$, $p=.02$. Specifically, autistic children had significantly flatter aperiodic exponents than NT children, indicating relatively less cortical inhibition in autistic children. (2) Aperiodic slopes the frontal cluster, $B=0.29$, $SE=0.12$, $p=.02$ and midfrontal cluster, $B=0.35$, $SE=0.12$, $p<.01$, were significantly associated with children's performance on the attention shifting task of EF Touch for the combined sample of ASD and NT cases. This indicates that flatter aperiodic exponents (reflective of less cortical inhibition relative to excitation) were related to weaker performance on attention-shifting, regardless of diagnosis.

Conclusions: These findings highlight significant neurophysiological differences between autistic and NT children, particularly in baseline, resting-state neural activity levels reflecting cortical E/I balance. Understanding these differences can inform the development of targeted interventions and support strategies for autistic children to enhance their executive function, a foundational skill to maximize functional outcomes during school transition. Further analyses with a larger sample collected across varied cultural backgrounds are currently underway and will be discussed.

209.004 What Can Brain State Dynamics and Transdiagnostic Samples Tell Us about Autism?

P. Thomson¹, P. Segura¹, S. Park², M. P. Milham³, T. Xu¹ and A. Di Martino¹, (1)Child Mind Institute, New York, NY, (2)Autism Center, Child Mind Institute, New York, NY, (3)Nathan S. Kline Institute for Psychiatric Research, Orangeburg, NY

Background: Research converges onto brain dysconnectivity models of autism largely characterized by a mosaic of hyper- and hypo-connectivity across large-scale networks. However, the networks involved have varied across studies, leaving an incomplete picture of connectivity patterns in autism. Most prior work has focused on time-averaged measures that only capture a static representation of brain connectivity, thus ignoring dynamic shifts in brain networks and between-network interactions over time. Additionally, most studies have focused on ‘case-control’ group mean comparisons, limiting the ability to assess inter-individual variability across continuous ranges of clinically-relevant measures. This presentation represents a departure from prior research by introducing results from a novel application of dynamic connectivity analyses in resting-state functional MRI data from children on the autism spectrum and/or with attention-deficit/hyperactivity disorder (ADHD), two frequently co-occurring neurodevelopmental conditions.

Objectives: The aim of this presentation is to illustrate the potential of studying dynamic functional connectivity in transdiagnostic neuroimaging samples to inform neural models of autism and their clinical relevance. Specifically, this presentation will: 1) introduce the coactivation pattern (CAP) approach, selected as a validated, robust method to assess dynamic changes in functional connectivity; 2) share results of CAP analyses aimed to identify prominent brain states across a sample of children with autism and/or ADHD; 3) provide initial findings on the links between dynamic properties of brain states and symptoms of autism and ADHD transdiagnostically.

Methods: Analyses were conducted on high quality resting-state functional MRI data from $n=166$ children (75% male, 8.9 ± 1.7 years old) with rigorously confirmed autism and/or ADHD. Eight CAPs (brain states) were derived across the sample using k-means clustering. Properties of these CAPs were computed for each person, including: dwell time —mean continuous time spent in a given brain state; occurrence rate —proportion of total time spent per state; incidence rate —number of times entering each state. Spearman partial correlations tested dimensional associations between CAP properties, and autism and ADHD symptoms (covariates: age, sex and in-scanner motion). Based on prior literature, a priori analyses focused on CAPs showing coactivation involving the default network (DN). Further analyses explored behavior associations with other identified CAPs.

Results: Analyses identified eight brain states organized into pairs of states with opposing network activation. Analyses focusing on the two state pairs prominently involving the DN revealed that dwell time in one of these states (CAP 6) was positively correlated with autism symptoms ($r=.19$, $p=.016$), and negatively correlated with ADHD symptoms ($r=-.20$, $p=.010$). Notably, CAP 6 is characterized by simultaneous deactivation of the DN and frontoparietal network, accompanied by activation of the somatomotor network. Exploratory analyses on other CAPs revealed that lower incidence rate of the visually dominant state (CAP 3) was also associated with higher autism symptoms ($r=-.27$, $p_{FDR}=.019$).

Conclusions: Findings revealed a double dissociation by symptom domain for time spent in the brain state involving networks previously reported to show connectivity differences in studies of autism or ADHD, thus clarifying their role across conditions. Results suggest that dynamic connectivity approaches are sensitive in identifying brain-behavior associations in clinically heterogeneous samples.

Panel Session

211 - Novel Transdiagnostic and Personalised Approaches for the Assessment and Support of Autism and Neurodevelopmental Conditions

May 2nd, 2025, 10:30 AM - 12:30 PM - 608-609

Panel Chair: Adam Guastella, *Faculty of Medicine and Health, University of Sydney, Sydney, NSW, Australia*

Discussant: Adam Guastella, *Faculty of Medicine and Health, University of Sydney, Sydney, NSW, Australia*

The presentations in this panel showcase the latest innovative and cross-disciplinary research that is being conducted internationally to ensure that novel and personalised approaches to care can be rapidly translated into clinical practice for children with neurodevelopmental concerns. The panel has a strong focus on priority populations, those experiencing significant social disadvantage, and a translational focus. Speakers will discuss different approaches to transdiagnostic science and assessment relevant to autism, including developing genetic clinics for very young children before neurodevelopmental vulnerabilities are detected, using digital research registries in public health services to advance a transdiagnostic science that can better meet needs of a largely culturally diverse, priority populations, to developing data driven approaches to establish models of autism, ADHD and neurodevelopment, to reporting on how well established neurocognitive tests perform in differentiating and identifying needs and profiles.

Introduction

A. J. Guastella, *University of Sydney, Sydney, NSW, Australia*

211.001 How Integrating Genetics in Clinical Care Can Address a Growing Unmet Need and Facilitate Research Discovery

N. Hoang, J. Vorstman, J. Summers and A. Deshwar, *The Hospital for Sick Children, Toronto, ON, Canada*

Background: An increasing number of genetic variants are being associated with neurodevelopmental and psychiatric disorders (NPDs), including intellectual disability (ID) and autism spectrum disorder (ASD). A significant consequence of integrating genetic testing into pediatric practice is the rapid identification of genetically mediated vulnerabilities in very young children, even before NPD symptoms manifest. This emerging scenario presents new and largely unaddressed clinical challenges, as well as unique research opportunities.

Objectives: To address the needs of the growing population of parents whose newborns are identified as being at increased risk for neurodevelopmental and/or psychiatric outcomes based on genetic testing results, we have established the DAGSY (Developmental Assessment of Genetically Susceptible Youth) clinic. This presentation describes the rationale for and design of the DAGSY clinic, as well as its potential for clinically relevant research.

Methods: DAGSY is an interdisciplinary service offering integrated clinical genetic, psychiatric, and psychological expertise in a single patient visit. Several aspects contribute to DAGSY's innovative potential: 1) children are referred based on genetic risk alone, providing an opportunity to explore preventative interventions; 2) the DAGSY team is interdisciplinary, combining genetic counseling, child psychiatry, and psychology in a single visit; and 3) while DAGSY is primarily a clinical service, it also serves as a research platform. To exemplify the latter, we evaluated two young patients with variations affecting the same gene. Prompted by the similarity in their NPD profiles, we subsequently collected extensive phenotypic data from a cohort of 11 international patients, all of whom harbored predicted deleterious variants in the *DENND2B* gene. We investigated the functional effects of these *DENND2B* variants using zebrafish models.

Results: We will present diagnostic findings and clinical recommendations for the 250 children evaluated at the DAGSY clinic to date. We will also report our observations in 11 patients with *DENND2B* variants, two of whom were identified through DAGSY, including their neuropsychiatric profiles, which show an increased prevalence of episodic behavioral changes. Our zebrafish experiments demonstrated that the *DENND2B* variants found in these patients lead to a loss of protein function, affecting cilia formation.

Conclusions: The early identification of genetically mediated neuropsychiatric risk at an increasingly young age introduces a new, largely unmet clinical need in child psychiatry. The DAGSY clinic addresses this need while also serving as a research platform. As an illustration of the latter, our case series unveils the potential role of *DENND2B* in the etiology of NPDs. Our findings suggest that monoallelic loss-of-function variants in this gene influence cilia growth and are associated with a novel autosomal dominant neurodevelopmental disorder with an increased risk for psychosis.

211.002 Transdiagnostic Approaches within an Autism Science in the Australian Child Neurodevelopment Research Registry

K. A. Boulton¹, A. Hodge², N. Ong³, N. Silove⁴ and A. J. Guastella⁵, (1)Brain and Mind Centre, Children's Hospital Westmead Clinical School, Faculty of Medicine and Health, University of Sydney, Sydney, NSW, Australia, (2)Sydney Children's Hospital Network, Sydney, NSW, Australia, (3)The Children's Hospital at Westmead, Sydney, NSW, Australia, (4)Sydney Children's Hospital Network, Sydney, Australia, (5)Faculty of Medicine and Health, University of Sydney, Sydney, NSW, Australia

Background: Neurodevelopmental conditions, such as Autism Spectrum Disorder, affect 10% of the population, with most children receiving more than one diagnosis. Despite shared needs and high comorbidity, research and clinical practice has historically been diagnostically siloed, hampering advancements in knowledge and treatments to support these children. Adopting a transdiagnostic approach to neurodevelopment, where stable and shared markers of neurodevelopmental delay are identified, has potential to advance the science and practice of how we detect, assess, and support neurodevelopmental conditions.

Objectives: This presentation provides an overview of findings from a program of clinically integrated research using the Australian Child Neurodevelopment Research Registry. The registry is a digital platform integrated in public autism and developmental assessment settings in Australia. This talk focuses describing the body of work that has disseminated from the registry to enable identification of family focused transdiagnostic needs, strengths based approaches, and the transformation of assessment pathways to better meet the needs of families.

Methods: The data presented (N=2500) in the Australian Child Neurodevelopment Research Registry used mixed methods to: (1) collect information on large, priority cohorts of children and their families, with 50% representation from culturally diverse communities, 7% representation from indigenous communities and the majority of the populations reporting financial disadvantage; (2) detect diagnosis specific and transdiagnostic needs in this underserved population; (3) modify clinical service pathways based on these needs to personalise responses for each individual child to promote support and inclusion.

Results: Findings are presented across the entire cohort of 2500 children who presented to public health services for assessment, 76% of whom met criteria for Autism Spectrum Disorder. We describe the needs, strengths and barriers to supports identified by families across this cohort. We additionally report on the development and implementation of transdiagnostic assessment measures so that services can better capture this information. We then provide data to show how transdiagnostic and symptom profiles in this population predict function and disability. We present data to describe how the clinical service has modified pathways in response to this data.

Conclusions: Results highlight the significant unmet transdiagnostic needs shared across children with neurodevelopmental conditions. Findings support transdiagnostic models of neurodevelopment to further a developmentally sensitive science that can reveal how broad developmental delays contribute to profiles and functioning. We also discuss current responses and approaches initiated by our team to provide swift responses to unmet transdiagnostic needs, such as the use of digital tools to improve access to tailored supports and facilitate clinical monitoring and tracking of needs over time.

211.003 The Monash Autism-ADHD Genetics and Neurodevelopment (MAGNET) Project: A Transdiagnostic Exploration of Neurodevelopment and Mental Health in Children and Adolescents

B. Johnson¹, T. Chau², R. Knott¹, E. J. Forbes³, J. Langmead⁴, A. Finlay⁵, N. Johnston², K. Cappel¹, J. Tiego⁴, K. Williams³ and M. A. Bellgrove¹, (1)Monash University, Notting Hill, VIC, Australia, (2)Department of Paediatrics, Monash University, Clayton, VIC, Australia, (3)School of Psychological Sciences, Monash University, Melbourne, VIC, Australia, (4)Turner Institute for Brain and Mental Health, Monash University, Clayton, VIC, Australia, (5)Paediatrics, Monash University & Monash Health, Melbourne, VIC, Australia

Background: Neurodevelopmental conditions, such as autism and attention deficit hyperactivity disorder (ADHD), emerge in childhood and are associated with co-occurring mental health conditions, such as anxiety and depression, and increased risk of suicide. The categorical diagnoses (e.g. DSM-5, ICD-11) for autism and ADHD have broadened over time to capture a wider range of clinical presentations. However this has increased the variability in how symptoms present among individuals with the same diagnosis, and alongside the high prevalence of co-occurring conditions, contributes to diagnostic delays and creates challenges for clinicians in formulating treatment and support recommendations. To address this, the Monash Autism and ADHD Genetics and Neurodevelopment (MAGNET) Project was established in 2019 to better understand the overlap between autism, ADHD, broader neurodevelopmental traits, and their overlap with mental health traits. This landmark cohort is currently comprised of 600 children and >850 parents, who have been trans-diagnostically and deeply phenotyped across behavioural, neurocognitive, brain imaging and genetic measures.

Objectives: To create data-driven hierarchical and dimensional models of neurodevelopment and mental health traits that applies to children and adolescents, organised at varying levels of granularity, from clinical traits through to neurocognitive and motor biomarkers (e.g. oculomotor and vocal acoustic biomarkers).

Methods: Families (i.e. probands, siblings and parents) were recruited from across Victoria, Australia, from the community and from paediatrician referral, with diagnosis

for all participants confirmed by a paediatrician or psychologist, and speech pathologist. All participants undertook all assessments at a single site (Monash University), regardless of diagnostic status. Here we present data from autistic (n = 83), ADHD (n = 80), autism+ADHD (n = 170) and neurotypical children (n = 158) who have been phenotyped using parent-rated measures of neurodevelopment, mental health, quality of life and adaptive functioning, alongside standardised clinician-administered cognitive (e.g. WISC), speech and language (e.g. CELF-5) and semi-structured assessments (i.e. ADOS), and direct child measures, including eye tracking and neurocognitive tasks.

Results: Hierarchical dimensional models of parent-rated neurodevelopmental and mental health traits autism and ADHD share a common higher-level factor called Neurodevelopment and a middle-level factor called Emotional or Behavioral Dysregulation. Internalizing (e.g., anxiety, depression) and externalizing (e.g., aggressive behavior) issues were mostly separate from autistic and ADHD traits, with a unique role for pragmatic and structural language. Preliminary results from linear mixed effects models of more granular transdiagnostic features such as vocal acoustic markers have revealed significant associations between inattentive traits and pauses during speech, while autistic traits (SRS-2) were associated with variability or perturbation (jitter) and articulation rate. Linear mixed effect models of oculomotor markers revealed transdiagnostic patterns in responses to motor error (i.e. variability final eye position following saccadic adjustments, frequency of catch-up saccades).

Conclusions: Understanding autism, ADHD and mental health dimensionally, rather than as categories, suggests there might be overlapping sources of emotional and behavioural traits.

211.004 A Systematic Review and Meta-Analysis of the Transdiagnostic Associations between Cognition and Neurodevelopmental and Mental Health Disorders.

D. C. Coghill, *University of Melbourne, Melbourne, VIC, Australia*

Background: While cognitive impairments are reported across all mental disorders and neurodevelopmental conditions it is often difficult to make comparisons both within and between disorders due to the methodological variations between studies. One major limitation in interpreting the findings of these studies is the use of very different cognitive tasks to measure similar cognitive functions. The Cambridge Neuropsychological Test Automated Battery (CANTAB) is a well validated battery of tasks that has been used for over 30 years to study cognition across a wide range of neurodevelopmental and mental health conditions.

Objectives: To address the issue of between study task variation, we aimed to investigate the similarities and differences in cognitive functioning profiles on tasks from CANTAB across autism spectrum disorder (ASD), attention-deficit/hyperactivity disorder (ADHD) and a range of mental health disorders using systematic review and meta-analysis.

Methods: We systematically searched: MEDLINE, PsycINFO, EMBASE, PubMed, Cambridge Cognition (from database inception to 16 January 2024) with no language restrictions. Included studies compared cognitive outcomes, on tasks from the CANTAB battery, in individuals with a mental health disorder (including ASD, ADHD, anxiety, depression, bipolar, obsessive-compulsive disorders, psychosis, and posttraumatic stress disorder) to a comparison group without a neurodevelopmental or mental health disorder. All studies diagnoses were confirmed using a validated diagnostic method (i.e., diagnostic interview). We excluded participants taking psychiatric medication. Random effects meta-analyses were performed to calculate standardised mean differences (Hedges' g) between individuals with a mental health disorder and controls. This study was pre-registered in PROSPERO (CRD4202295849).

Results: 140 studies were included for data extraction, and meta-analyses were conducted across 13 CANTAB tasks yielding 19 different outcome measures, comprising 9903 participants across clinical groups and 7244 controls. Participants with ASD, ADHD and all included mental health disorders had poorer performance than controls across all the reported CANTAB cognitive outcome measures. There was no unique cognitive profile for any of the included conditions. However, while small to medium effect sizes were reported across most disorders, large effect sizes were reported for some outcomes in both psychosis and ASD.

Conclusions: These results strongly support cognitive differences as a transdiagnostic feature of neurodevelopmental disorders. They also provide compelling evidence that, while cognitive differences may be more pronounced in ASD and psychosis, there are no unique cognitive profiles for any of the included neurodevelopmental and mental health disorders. On the basis of these findings, we conclude that cognitive profiles should not be used to define particular mental health disorders or to differentiate between them in either research or clinical practice settings. While not useful in making a diagnosis they may however help to define an individual's strengths and weaknesses and inform clinical recommendations.

Panel Session

212 - Discursions on Discourse: How Autistic Traits Contribute to Language Processing and Expression in Various Discourse Contexts

May 2nd, 2025, 10:30 AM - 12:30 PM - 606-607

Panel Chair: Emily Zane, *Communication Sciences and Disorders, James Madison University, Harrisonburg, VA*

Moderator: Molly Losh, *Communication Sciences and Disorders, Neurodevelopmental Disabilities Lab, Northwestern University, Evanston, IL*

Discussant: Molly Losh, *Communication Sciences and Disorders, Neurodevelopmental Disabilities Lab, Northwestern University, Evanston, IL*

Discourse involves language that is “bigger than a sentence,” where word/phrase meaning often depends on extrasentential information, including discourse context. Perhaps due to the demands involved in incorporating contextual information, extensive evidence finds that autistic people diverge from non-autistic people in their interpretation and expression of various forms of discourse. The current panel represents a deep dive into factors that may contribute to such differences, by exploring how diagnosis, autistic traits, and/or underlying subskills, like executive function, correlate with subtle differences in discourse expression, comprehension, and processing for adolescents and adults. Included projects use differing data-collection, coding, and analysis techniques to examine features of three discourse types: conversation, narrative, and persuasion. Projects involve creative manipulations of discourse context, by, for example, changing who participants interact with and switching discourse modality from words to pictures. The panel’s audience will learn about how such manipulations affect autistic participants’ performance and which underlying subskills may explain differences. Together, findings suggest that while some notable differences in autistic discourse depend on context and cognitive subskills separable from autism (e.g., language ability), others are context independent and directly correlative with autistic traits.

Introduction

E. Zane, *FACE Lab, James Madison University, Boston, MA*

212.001 Autistic Adults Display Different Verbal Behavior Only in Mixed-Neurotype Conversations: Evidence from a Referential Communication Task

P. Geelhand¹, **F. Papastamou²**, **S. Jaspard³** and **M. Kissine⁴**, *(1)ACTE — Center of research in Linguistics — ULB Neuroscience Institute, Université libre de Bruxelles, Brussels, Belgium, (2)Université libre de Bruxelles, Bruxelles, Belgium, (3)Belgian American Chamber of the South (BACoS), Duluth, GA, GA, (4)ACTE — Center of research in Linguistics — ULB Neuroscience, Université libre de Bruxelles, Brussels, Belgium*

Background: Recent accounts of social difficulties in autism suggest that autistic and non-autistic individuals mutually misunderstand each other (Davis & Crompton, 2021). This assumption aligns with findings that mixed-neurotype interactions are less efficient than same-neurotype interactions (Crompton et al., 2020). However, in studies finding a ‘same-neurotype communicative advantage,’ interaction partners knew about each other’s neurotype. Therefore, it remains unclear whether different outcomes between mixed- and same-neurotype interactions are due to contact with a different neurotype or to inherently different communication styles, specific to each neurotype. Moreover, neurotype matching has been primarily investigated in verbal interactions. However, autistic adults often prefer written over oral communication (Howard & Sedgewick, 2021), possibly due to the lower social pressure associated with non-face-to-face interactions. As such, it remains unexplored whether the communication challenges of mixed-neurotype pairs experienced during verbal interactions also transpire in written interactions.

Objectives: This study investigates: (1) how neurotype (mis)match influences communication style when participants are unaware of their partner’s neurotype, and (2) how this manifests in both oral and written interactions.

Methods: 134 adult participants were divided into three same-sex dyad types: 23 autistic dyads, 23 non-autistic dyads, and 21 mixed-neurotype dyads. Participants were unaware of their partner’s neurotype. Dyads completed an online referential communication task where a ‘Director’ guides a ‘Matcher’ to rearrange abstract images, using both written (chat) and oral (microphone, no video) communication modes. Interaction outcome measures were task duration and verbosity of the Director. Task duration was the time (in seconds) dyads took to complete the task. Verbosity was the number of words produced by the Director during the task and were categorized as either “image description” or “small talk”.

Results: Across both oral and written communication modes, we found that non-autistic dyads were overall faster than autistic and mixed dyads. There was no difference in task duration between autistic and mixed dyads. For verbosity, across both oral and written communication modes, there was no difference regarding image description between same-neurotype dyads. Within mixed dyads, however, autistic directors used more words to describe images than non-autistic directors. Likewise, for small talk, there were no significant differences in verbosity between same-neurotype dyads. Within mixed dyads, autistic directors were more verbose than non-autistic directors. Furthermore, autistic directors from mixed dyads were more verbose than autistic directors from autistic dyads and non-autistic directors from non-autistic dyads. Non-autistic directors from mixed dyads were not more verbose than non-autistic directors from non-autistic dyads and autistic directors from autistic dyads.

Conclusions: Across both communication modes, non-autistic dyads completed the task faster than autistic and mixed dyads, indicating that dyads with at least one autistic partner were generally slower. Notably, in mixed dyads, autistic Directors were more verbose than non-autistic Directors across both communication modes. These results suggest that neurotype mismatch triggers different verbal behavior in autistic adults, even without awareness of the partner’s neurotype and in the absence of non-verbal cues. This suggests inherent differences in communication styles between autistic and non-autistic individuals, persisting across both oral and written communication modes.

212.002 Linguistic Alignment in Individuals with and without a History of Autism: The Role of Discourse Context, Theory of Mind, and Verbal Ability

M. J. Stabile, **A. Paxton** and **I. M. Eigsti**, *Psychological Sciences, University of Connecticut, Storrs, CT*

Background: Conversational partners frequently converge on similar linguistic structures when engaged in discourse. This “linguistic alignment” enhances communicative clarity and promotes social affiliation. Studies using structured tasks report comparable alignment in autistic (AUT) and neurotypical (NT) participants; however, studies of *extended spontaneous discourse* suggest reduced alignment in autism. The current study extends past work to include individuals diagnosed with autism in childhood who no longer meet criteria later in life (loss of autism diagnosis; LAD).

Objectives: This study probed group differences in alignment overall, and as a function of task-internal discourse contexts. Associations with language, theory of mind, and executive functioning to inform theories of linguistic alignment.

Methods: The ADOS-2 was administered by trained graduate clinicians to 89 autistic, LAD, and NT adolescents and adults (Table 1) as part of a larger study of LAD outcomes. Sessions were recorded and transcribed, and three forms of alignment (lexical, semantic, and syntactic) were measured across four subtests of the ADOS using an open-source computational tool (Duran, Paxton, & Fusaroli, 2019). Participants completed measures of verbal, nonverbal, executive skills, and a theory of mind (ToM) task. Mixed-effects models examined fixed effects and interactions of group and task for each form of alignment, controlling for age, and compared actual alignment with chance alignment from a control set of response pairs. Analyses examined associations with age, verbal ability, ToM, and executive function.

Results: Groups did not differ in verbal, nonverbal, executive or ToM abilities, and generally engaged in comparable levels of each form of alignment. However, on a task that involved explicit discussion of social content (“social difficulties”), the LAD group showed more lexical alignment than both the AUT ($p = .03$) and NT ($p = .03$) groups; Fig 1. A similar pattern was observed for syntactic alignment, though analyses did not survive correction for multiple comparisons (LAD vs NT, $p = .08$; LAD vs. AUT, $p = .05$). The social difficulties task elicited more semantic alignment across groups than each of the other three tasks (Tuesday story, description of a picture, and school/work interview questions; $p < .001$). Each form of alignment was positively associated with age for the NT ($ps \leq .03$) but not LAD and AUT groups ($ps \geq .20$). Similarly, ToM performance was positively associated with lexical ($r = .36$, $p = .04$) and syntactic ($r = .48$, $p = .01$) alignment for the NT group alone.

Conclusions: Results revealed no differences in autistic participants in aligning their word choices, subject matter, or sentence structures, relative to neurotypical peers. Further, LAD individuals who display few or no current symptoms of autism were more aligned with partners, suggesting an increase in affiliative behavior, particularly in contexts in which social content is explicitly invoked as a topic of discussion. This, and the limited role of ToM and verbal abilities, point to the potentially greater impact of experience with intervention and with similar kinds of interactions in discourse alignment.



212.003 I'm Convinced! the Role of Content and Manner of Delivery in Convincing Peers in Autistic and Non-Autistic Adolescents' Persuasive Discourse

J. H. L. Wong¹, M. L. Beauchamp¹, G. Luk², E. A. Smith³, K. H. Onishi⁴ and A. Nadig⁵, (1)McGill University, Montreal, QC, Canada, (2)Educational & Counselling Psychology, McGill University, Montreal, QC, Canada, (3)Linguistique, Université du Québec à Montréal, Montreal, QC, Canada, (4)Department of Psychology, McGill University, Montreal, QC, Canada, (5)School of Communication Sciences and Disorders, McGill University, Montreal, QC, Canada

Background: Persuasive discourse involves using language to change others' thoughts or behaviours. (Rocklage et al., 2018). As it is a complex skill that becomes refined in adolescence (Heilmann et al., 2020), its development may be difficult for autistic individuals who experience social communication challenges (Kelly et al., 2018). Indeed, during persuasive discourse, autistic adolescents generate fewer supporting arguments and counterarguments than neurotypical peers (To et al., 2016), demonstrating that *content* (or macrostructure) of persuasive discourse may be affected by autism. It is also important to consider *manner of delivery*, because for the same persuasive discourse, content and manner of delivery may lead to different impressions: neurotypical raters had negative first impressions of autistic speakers based on audiovisual clips, but not based on transcripts alone (Sasson et al., 2017).

Objectives: We examined whether *content* and *manner of delivery* play a role in how convinced a listener was to make a proposed change (*convincingness*) in the persuasive discourse of both autistic and non-autistic adolescents.

Methods: Data collection, transcription, and coding/analyses are on-going. Of the forty-two French-speaking adolescents who have participated so far, we report on 27 whose data have been transcribed and coded (11 autistic; 16 non-autistic; ages 14-19). Groups did not statistically differ with respect to age, receptive vocabulary, grammatical ability, or nonverbal IQ. Participants were asked to persuade a peer (enacted by a research assistant) to do something (e.g., switch shifts with them at a part-time job). To assess content, transcripts of the persuasive language samples were analyzed using the Persuasive Scoring Scheme (Heilmann et al., 2020), which evaluates the presence and complexity of macrostructure elements such as supporting arguments, counterarguments, and compromises, resulting in a composite score. To assess manner of delivery, an independent listener viewed the persuasive sample by video and rated the speaker's confidence, body language, and tone of voice. A second independent listener rated how convinced they were to make the proposed change. Study staff were neurotypical, naïve to diagnostic group, and 18 – 22 years old.

Results: The two groups did not differ significantly on content, manner of delivery, or convincingness scores. In our preliminary analysis, across all participants, manner of delivery (but not content) positively and significantly predicted convincingness. As shown in Figure 1, the relationship between manner of delivery and convincingness differed significantly between the two groups: for the non-autistic group, higher manner of delivery scores resulted in the listener being more convinced, possibly due to their following neurotypical or ‘standard’ ways of speaking. However, for the autistic group, manner of delivery scores were unrelated to how convinced the listener was.

Conclusions: This study informs us about the discourse factors that may ultimately determine whether an adolescent can achieve their goals when interacting with neurotypical partners.



212.004 Visual Attention to the Climax of Pictorial and Verbal Narratives Decreases with Increasing Autistic Traits

E. Zane¹, E. Booth¹, R. Bunner¹, H. Chappell¹, C. Soong¹, N. Cohn² and E. L. Coderre³, (1)Communication Sciences and Disorders, James Madison University, Harrisonburg, VA, (2)Tilburg University, Tilburg, Netherlands, (3)University of Vermont, Burlington, VT

Background: Narrative comprehension can be difficult for autistic individuals, at least when narratives are presented in words (McIntire et al., 2017). Some research has suggested autistic people focus on story elements that are irrelevant to the “main idea,” thereby prohibiting global story understanding (Nuske & Bavin, 2011). Building on this, we test whether attention to non-central story-elements corresponds with autistic traits, and importantly, whether these differences transcend the verbal modality, affecting even the processing of stories presented in pictures (e.g., comic strips).

Objectives: We seek to determine whether/how autistic traits relate to a person’s attention to important story elements, irrespective of whether stories are presented in words or pictures, and even when taking into account other factors related to comprehension (e.g., single-sentence comprehension).

Methods: Fifty-two (52) adults (m age = 24:3, 34 cisgender female, 6 cisgender male, 11 nonbinary and/or trans male, 1 gender queer) responded to a recruitment effort seeking autistic and non-autistic adults to participate in a comprehension study. Participants completed multiple assessments measuring cognition, language, and autistic traits. For current analyses, we focus on scores from three: The Sentence Comprehension subtest of the Wide Range Achievement Test-5th Edition (WRAT-SC; m = 111.37, range = 92-133) (Wilkinson & Robertson, 2017); the Visual Language Fluency Index (VLFI), which measures experience and expertise engaging with comics (m = 9.37, range = 2.12-32.63 [scores between 12 and 20 of represent average experience/expertise]) (Cohn, 2014); and the AQ (m = 22.74) (Baron-Cohen, 2001).

Each participant viewed 96 novel narratives: 48 wordless *Peanuts* comics and 48 written stories. For each narrative, a single panel/sentence was identified, *a priori*, as representing the peak/climax event. Participants viewed/read each narrative and then “segmented” the narrative into two constituent sections (Figure 1). Eye-tracking was recorded throughout.

To analyze data, we used a backwards, stepwise procedure to determine the best-fitting mixed-effects linear regression model for predicting proportion dwell time to each sentence/panel for each story with the following variables included as possible fixed effects and interactions: VLFI, WRAT-SC, AQ, narrative modality (linguistic vs. pictorial), and panel/sentence type (climax vs. not).

Results: In the identified best-fitting model, no main effects significantly predicted proportion dwell to sentences/panels, but several interactions did: panel/sentence type by AQ ($p < .001$), panel/sentence type by modality ($p < .001$), panel/sentence type by WRAT-SC ($p = .03$), and modality by VLFI ($p < .001$). Focusing on results that speak to study objectives, the significant AQ-by-panel/sentence-type interaction reflected decreased relative looking to climax panels/sentences as AQ scores increased. Figure 2.

Conclusions: As autism traits increase, participants’ relative visual attention to a story’s climax decreases, even when stories are presented in pictures, and even when accounting for variance related to other abilities likely related to comprehension, like sentence comprehension and comic-strip experience. Results importantly implicate that autistic differences in story processing are independent of presentation modality (i.e., words or pictures), suggesting that well-documented struggles with reading comprehension, at least for written stories, may depend on differences in story-parsing and attentional constructs that underlie the comprehension of narratives no matter their form (Coderre et al., 2018).



Panel Session

213 - Gender Diversity and Autism: Gender Trajectories and Gender Outcomes in Complex Socio-Political Contexts

May 2nd, 2025, 2:00 PM - 4:00 PM - 6B

Panel Chair: John Strang, *Gender and Autism Program, Children's National Health System, Washington, DC*

Discussant: Meng-Chuan Lai, *Campbell Family Mental Health Research Institute, Centre for Addiction and Mental Health, Toronto, ON, Canada*

Increased public awareness of the common autism and gender diversity intersection has spurred research interest and advocacy. Being in the public eye has also increased efforts to restrict care access. Some legislative initiatives to limit transgender youth rights have employed as justification the common autism co-occurrence, based on apparent ableist assumptions that autistic youth should not be trusted to make decisions about their lives and bodies. These assumptions and legal initiatives have advanced with little research available to evaluate or comment on them. This panel will present the first long-term outcome findings of autistic transgender youth followed into adulthood. Patterns of continuity as well as shift in both gender and gender-related medical care will be examined, with consideration of whether the diagnosis of autism changes the likelihood for detransition and regret. A cross-national approach is employed in three of the talks, including report on how autistic transgender youth are faring in locations which restrict care and broader rights. Equity and accuracy in autism-related neuroscience are discussed in the context of capturing and modeling gender beyond assigned sex at birth. Preliminary brain findings demonstrate that gender diversity measured in adolescence retrospectively predicts greater variations in early childhood brain structure.

Introduction

J. F. Strang, *Center for Autism Spectrum Disorders, Children's National Health System, Washington, DC*

213.001 Gender and Gender-Related Care Outcomes of Autistic Transgender Youth Followed into Adulthood

J. F. Strang¹, **L. Baczewski**², **A. L. Fischbach**³, **L. Campos**⁴, **J. K. Lee**⁵, **C. W. Nordahl**⁶ and **A. I. van der Miesen**⁶, (1)Gender and Autism Program, Children's National Health System, Washington, DC, (2)Center for Autism, Center for Autism Spectrum Disorders, Children's National, Washington, D.C., DC, (3)Department of Psychology, University of Cincinnati, Cincinnati, OH, (4)Center for Autism Spectrum Disorders, Children's National Hospital, Rockville, MD, (5)Department of Psychiatry and Behavioral Sciences, UC Davis MIND Institute, Sacramento, CA, (6)Department of Child and Adolescent Psychiatry, Center of Expertise on Gender Dysphoria, Amsterdam University Medical Centers, Location Vrije Universiteit, Amsterdam, Netherlands

Background: The common intersection of autism and gender diversity has been reported across the age span and in multiple countries (Kallitsounaki & Williams, 2023). No studies have investigated gender and gender-related care outcomes of autistic transgender youth followed into adulthood. Yet, increasing rhetoric and related legislative initiatives have been advanced to limit autistic transgender youth access to care and broader liberties.

Objectives: This study aims to begin to fill the profound gap in research on autistic transgender youth gender trajectories. We present the findings of two cohorts of autistic transgender children/adolescents followed into adulthood: one from the U.S. ($n=27$ at baseline) and one from the Netherlands (Dutch; $n=23$ at baseline). Both cohorts received care according to the international standards of care for gender-diverse people.

Methods: U.S. cohort: 66 U.S. transgender adolescents were assessed through comprehensive developmental, in vivo diagnostic, and multiple informant evaluation to provide high-confidence diagnostics of autism (Strang et al., 2023). Of the 66 youth, 27 met criteria for autism (M_{age} at $T1=17.37$; $SD=2.08$). U.S. participants provided follow-up report on their gender, gender-related medical care, and anxiety ~4 years later in young adulthood (M_{age} at $T2=21.09$; $SD=1.88$). Dutch cohort: As Dutch participants were first diagnosed in the 2000s, the autism diagnostic protocol differed from contemporary approaches. Twenty-three of 115 gender-diverse children and adolescents were diagnosed autistic with the DISCO and expert clinician child interview (M_{age} at $T1=10.8$, $SD=3.58$). Long-term outcome assessments were conducted ~15 years following baseline (M_{age} at $T2=29.42$, $SD=4.90$). Participants reported on gender and gender-related care outcomes.

Results: Retention rate for the U.S. cohort (at ~4 years) was 96.3%. Retention rate for the Dutch cohort (at ~15 years) was 60.1%. Continuity of gender-diverse identities was high in both cohorts (see Figures 1 and 2). Among U.S. adults, 92.3% were gender-diverse at T2; among Dutch adults, 85.7% were gender-diverse at T2. No medical gender reversals were reported among either cohort, though one Dutch participant reported mixed feelings about their gender-affirming surgery and one U.S. participant stopped their hormone treatment once the desired effects were achieved. Those who shifted to cisgender identities ($n=4$ across both cohorts) never received gender-related medical care. In the U.S. cohort, for those who wanted gender-related medical care ($n=25$), earlier receipt of such care (by T1) was associated with significant reductions in anxiety across time ($b=-4.55$, $SD=1.73$, $t=-2.63$, $p=.016$). Comparing gender trajectories across both samples, 50% of U.S. participants had moved to or added a nonbinary identity by T2, while only one Dutch participant was nonbinary.

Conclusions: Two separate studies in two countries found generally high rates of gender diversity continuity for autistic transgender youth receiving standard-of-care healthcare followed into adulthood. Four of 40 moved to cisgender identities in adulthood and there were no documented medical gender reversals. Study findings do not support current rhetoric suggesting that autistic transgender youth are highly likely to shift away from gender diversity and reverse medical gender transitions. Findings should be interpreted in the context of a notable loss to follow-up in the Dutch 15-year study.



213.002 The Impact of Transgender-Limiting Legislation on Autistic Vs. Not-Autistic Transgender Youth

A. Hindenach¹, A. L. Fischbach², J. Feng³, A. I. van der Miesen⁴ and J. F. Strang⁵, (1)Children's National Hospital, Washington, DC, (2)Department of Psychology, University of Cincinnati, Cincinnati, OH, (3)Graduate School of Education, University of Pennsylvania, Philadelphia, PA, (4)Department of Child and Adolescent Psychiatry, Center of Expertise on Gender Dysphoria, Amsterdam University Medical Centers, Location Vrije Universiteit, Amsterdam, Netherlands, (5)Gender and Autism Program, Children's National Health System, Washington, DC

Background: Over the last four years, more than half of states in the United States (US) have restricted transgender youth healthcare and/or broader civil rights. Legislation in Arkansas and Ohio specifically limits autistic minors from accessing gender care, and Georgia defends their ban of several forms of care for all transgender youth based in part on the common co-occurrence of autism and gender diversity. In contrast to the US, the Netherlands is a country in which transgender youth are broadly accepted and affirmed, and by adulthood transgender youth in the Netherlands show mental health outcomes equivalent to their cisgender peers. Our team has, through an international Delphi study, identified the Netherlands as a gold standard comparator for research in the US to understand the impacts of varying policy on transgender youth wellbeing (van der Miesen et al., under review).

Objectives: This transnational study of transgender youth ages 11-16 sought to understand relationships between autism, legislative context, gender minority stress, perceptions of safety, and mental health. Three legislative and societal contexts are compared: the Netherlands ($n=73$), US states not restricting transgender youth civil rights ($n=51$), and US states restricting transgender youth civil rights ($n=52$), ranked in order of increasing legislative/societal restriction.

Methods: The recruitment of autistic youth was proportionally balanced between the US and NL ($n=50$ autistic, $N=175$ total). Each participant completed a face-to-face 1.5-hour virtual study visit. The protocol included measures validated and calibrated in both countries and in English and Dutch. Measures were: the Transgender Youth Perceptions of Environmental Support self-report interview (TYPES), which captures a young person's sense of safety as a transgender person; the Gender Minority Stress and Resilience Scale-Adolescent (GMSR-A) assessing non-affirmation and internalized transphobia; and the ASEBA Youth Self-Report (YSR total problems subscale) capturing overall mental and behavioral health. Autism diagnostic status and ratings on the Social Communication Questionnaire (SCQ) were collected from parents/caregivers.

Results: Perceptions of feeling safe as a transgender young person (TYPES) were lower among the autistic subgroup. More restrictive location was also related to lower perceptions of safety, suggesting an additive risk for autistic transgender youth in restrictive locations (Table 1, Row 1). Autistic transgender young people reported more experiences of not being affirmed in their gender, with a similar additive risk for those in restrictive contexts (Row 2). They also experienced a greater sense of internalized transphobia than those not-autistic (Row 3). Autistic transgender young people experienced more mental health problems than not-autistic transgender youth (rows 4-9). Lower sense of safety (Rows 4-5) and greater internalized transphobia (Rows 8-9) were each associated with exacerbated mental health problems in addition to autism, but autism did not predict mental health when included in the model with non-affirmation (Rows 6-7).

Conclusions: Results suggest that youth at the intersection of autism and gender diversity face particular risks for feeling unsafe and experiencing gender minority stress and related mental health challenges in the context of civil rights restrictions. Our ongoing longitudinal study seeks to understand how these stressors will affect autistic youth development over time.



213.003 Gender Diversity in Adolescence Linked to Early Childhood Brain Structure in Autistic and Not-Autistic Youth

J. K. Lee¹, B. Heath¹, D. S. Andrews², A. Marquand³, J. F. Strang⁴, M. Solomon¹ and C. W. Nordahl¹. (1)Department of Psychiatry and Behavioral Sciences, UC Davis MIND Institute, Sacramento, CA, (2)Department of Psychiatry and Behavioral Sciences, MIND Institute, UC Davis Medical Center, Sacramento, CA, (3)Centre for Neuroimaging Sciences, King's College London, London, United Kingdom, (4)Gender and Autism Program, Children's National Health System, Washington, DC

Background: Substantial heterogeneity exists in the neurophenotypes of autism, hindering scientific progress in understanding the neural basis of autism. Gender diversity encompasses the range of differences between an individual's internal, subjective experience of their gender identity and the sex assigned to them at birth. Gender diversity is proportionally overrepresented in autism, with 8-20% of autistic individuals identifying as gender diverse. Neuroimaging research has reported differences in brain structure and function associated with gender diversity, yet the autism neuroimaging literature has virtually ignored how gender diversity may impact our models of autistic neurophenotypes. Until we parse the neural heterogeneity of gender diversity in the brains of autistic youth, the field will lack explanatory power beyond that of sex assigned at birth. This study leverages a longitudinal brain imaging study, the Autism Phenome Project (APP) to investigate how gender diversity reported during adolescence is retrospectively associated with individual differences in brain structure from when they were 2- to 4-years-of-age.

Objectives: Retrospectively assess brain differences in early childhood in association with self-reported gender diversity in adolescence.

Methods: As part of ongoing longitudinal data collection in the APP during adolescence (age 15-18) 41 participants (18 autistic, 23 TD) provided self-report data related to their gender diversity, which includes felt femininity and masculinity over two 7-point Likert scales. These scores were reverse coded by assigned sex and then averaged to create a distance scale from 0 to 6 of increasing gender diversity. Retrospective analysis of cortical thickness and subcortical volumes at age 2- to 4-years of age was assessed from MRI acquired during natural sleep from T1w images in 30 of these participants (15 autistic). A reference sample from the general population, comprising ~60,000 MRI scans was utilized to model lifespan trajectories of cortical thickness and subcortical regions of interest (ROIs) using Bayesian Linear Regression with likelihood warping. We leverage this normative model to derive Z scores for each ROI for each participant which indicates the degree to which the ROI differs from the age- and sex- normed means. We counted the number of ROIs within each individual with Z-scores at the extreme tails of the normal distribution, defined as exceeding an absolute Z-threshold > 2, regressed onto a model including gender diversity scores, autism diagnosis, and developmental quotients from the Mullen Scales of Early Learning.

Results: Autistic participants on average reported greater diversity ($M=1.88$) than did non-autistic participants ($M=0.7$) ($b=1.18$, $SE=0.50$, $t=2.38$, $p=.023$), and scores exhibited overall greater variability in autism (Levene-Test, $p=0.011$). Poisson regression revealed a significant effect of self-rated gender diversity in adolescence, ($\beta=1.06$, $SE=0.05$, $z=5.2$, $p<.0001$), such that for each one-unit increase in gender diversity on its Likert scale, the expected count of extreme deviations increased by 1.3. Autism diagnosis and developmental quotients did not reach statistical significance ($ps<.05$).

Conclusions: Gender diversity in adolescence is linked to early childhood brain structure differences in both autistic and non-autistic individuals, underscoring the need to account for gender diversity when examining neurophenotypic variability in autism.

213.004 Profiles of Detransition in Autistic Gender Diverse Individuals

K. R. MacKinnon, York University, Toronto, ON, Canada

Background: Detransition, defined as stopping, shifting, or reversing a gender transition, is a heterogeneous phenomenon reported by some gender-diverse people. Detransition can be prompted by various social, medical, and mental-health-related factors. These factors can include lack of support or discrimination, shifts in gender identity, medical complications, among other reasons. Many individuals who detransition affirm a sexual or gender minority identity (e.g., LGBTQ+). While decisional regret can overlap with detransition, some people also report positive or ambivalent feelings about their journey.

From an exploratory mixed-methods study completed in the United States and Canada, this study investigates profiles of detransition as they relate to autism as well as other socio-demographic characteristics and life experiences.

Objectives: Employing survey and qualitative interview data from the Detransition Analysis, Representation, and Exploration (DARE) study, we: (1) examined discrete profiles of detransition, their respective rates of autism, and whether autistic individuals were likelier to report certain pathways/reasons to detransition; (2) investigated whether experiences of regret were similar or different among autistic as compared to non-autistic individuals who detransition, and (3) sought to qualitatively understand the care experiences of autistic participants who underwent detransition.

Methods: The DARE Study included 957 individuals ages 16-74 in the U.S. and Canada who self-reported a lifetime experience of gender detransition. To understand autism and detransition, proportional descriptives of autistic vs. non-autistic participants were presented and compared to current estimates of the rates of autism within gender diverse communities, generally. Prevalence of regret relating to pathway to detransition, as well as autism status were explored. Finally, qualitative themes of the intersection of autism and detransition were identified ($N=40$ from the surveyed sample).

Results: The sample had a mean age of 26 and 79% were assigned female at birth (AFAB). 25% of the DARE sample reported a formal autism diagnosis and 42% reported self-diagnosing or identifying as autistic. Latent class analysis identified four sub-groups of detransition profiles characterized by the following self-reported reasons to detransition: Class A ($n=315$; 90% AFAB): identity shift/reconceptualizing gender norms, worsening mental health, and decisional regret; Class B ($n=186$; 88% AFAB): identity shift/reconceptualizing gender norms, and overall satisfaction with treatments; Class C ($n=182$; 75% AFAB): discrimination/lack of support, worsening mental health, and decisional regret; and Class D ($n=271$; 62% AFAB): discrimination/lack of support, with overall treatment satisfaction. Rates of diagnosis of autism or autistic self-identity did not differ across these four sub-groups. Finally, qualitative analyses revealed a pattern of participants who were AFAB, mainly from Class A, receiving a late autism diagnosis, with some indicating they would have preferred to have been aware of being autistic prior to making gender-related care decisions.

Conclusions: These results suggest that detransition is a heterogeneous and complex experience requiring further research, particularly as it intersects with autism, sex/gender, and mental health care. Our results suggest that while some individuals who report experiences of detransition are also autistic, prevalence of decisional regret does not appear to be higher among autistic people when compared to non-autistic people who also report detransition.

214 - Translational Cross Species Neuroimaging Studies of Sensory Processing in Fragile X Syndrome and Autism

May 2nd, 2025, 2:00 PM - 4:00 PM - 6C

Panel Chair: Carol Wilkinson, *Department of Developmental Medicine, Boston Children's Hospital / Harvard Medical, Boston, MA*

Discussant: Carol Wilkinson, *Department of Developmental Medicine, Boston Children's Hospital / Harvard Medical, Boston, MA*

This panel brings together cross-species research on sensory processing in Fragile X syndrome (FXS) and autism. Featuring four talks, it integrates complementary neuroimaging findings from both rodent and human studies to describe potential neural mechanisms underlying alterations in sensory processing in these populations. The speakers will also address key benefits and limitations in studying sensory processing across species, including highlighting differences in recording techniques and presented stimuli, as well as developmental considerations in data collection and interpretation of sensory responses across the age range. The panel discussion will emphasize the clinical implications of these studies, and future steps for improving diagnostic and therapeutic strategies for individuals. Attendees will gain a deeper understanding of how diverse methodological approaches converge to uncover the complexities of sensory processing in autism-related disorders, and how these insights can advance the development of targeted interventions.

Introduction

C. L. Wilkinson, *Developmental Medicine, Boston Children's Hospital / Harvard Medical, Boston, MA*

214.001 How EEG Markers in FXS Relate to Behaviors

S. Lippe¹, **I. S. Knott²** and **M. Proteau-Lemieux³**, *(1)Neurosciences of Early Development Lab, CHU Sainte-Justine University of Montreal, Montreal, QC, Canada, (2)CHU Sainte-Justine Research Center, Neuroscience of Early Development lab, Montreal, QC, Canada*

Background:

Individuals with neurodevelopmental disorders exhibit atypical brain dynamics. Electroencephalographic (EEG) markers have been linked to autism spectrum disorders and intellectual disabilities and are believed to be useful for better understanding the underlying mechanisms of these conditions, as well as for assessing disorder severity and treatment-related recovery. In the case of Fragile X Syndrome, there is some consensus on which EEG markers are altered. However, the extent to which these markers correlate with behavior remains unclear.

Objectives:

The objective is to test whether the EEG markers altered in Fragile X Syndrome (FXS) are associated with the core behavioral symptoms observed in this population. The implication is that this will help identify which EEG markers should be targeted for modification through treatment.

Methods:

Forty-seven participants with FXS aged between 5-20, 49 participants with ASD, and 52 neurotypical controls with similar age distribution took part in the study. EEG features from resting-state and the auditory oddball paradigm using tones were extracted. Power spectrums, multiscale entropy, alpha peak frequency, component peaks amplitude and latencies (including the MMN) for each repetition of the oddball paradigm were compared between groups (MANCOVAS). Then, correlation and regression analyses were performed to assess whether they were associated with NVIQ, adaptive behavior, socialization, irritability, lethargy, inappropriate speech, repetitive behaviors, inattention, impulsivity, anxiety and depression.

Results:

Group comparisons confirmed signal complexity, alpha peak frequency, alpha band power, low gamma band power and habituation alterations, particularly in the FXS group. Increased N100 amplitude and reduced N100 habituation were associated with social affects and restricted and repetitive behaviors. Reduced N100 habituation and augmented MMN latencies were associated with reduced adaptive behaviors. EEG markers from the resting-state condition were also associated with the core symptomatology. Complexity measures were associated with NVIQ, while reduced alpha power and augmented gamma power were respectively associated with social avoidance, and lethargy and irritability.

Conclusions:

Alterations in EEG features in individuals with Fragile X Syndrome (FXS) reflect the severity of their behavioral impairments, making these features strong candidate markers for investigation in clinical trials. Whether these markers change in response to treatment-induced behavioral improvements remains an open question.



214.002 Characterization of Habituation to Tones in FXS, Autism, and Down Syndrome

W. An¹, **M. Khela²**, **M. Tsou³**, **K. Pawlowski⁴**, **N. Baumer⁵** and **C. L. Wilkinson⁶**, *(1)Pediatrics, Division of Developmental Medicine, Boston Children's Hospital, Boston, MA, (2)Tufts University, Medford, MA, (3)Boston Children's Hospital, Boston, MA, (4)Boston Children's Hospital, Boston, MA, (5)University of Colorado, Aurora, CO, (6)Department of Developmental Medicine, Boston Children's Hospital / Harvard Medical, Boston, MA*

Background: Fragile X syndrome (FXS) is a rare genetic disorder and is commonly associated with autism spectrum disorder (ASD) and intellectual disability. Previous studies have focused on FMR1 KO mice and adults with FXS and observed reduced neural habituation to repeated sounds, as evidenced by their electroencephalography (EEG) signals. However, little is known about the habituation phenotype in children with FXS and how it compares to children with idiopathic ASD and other neurogenetic disorders like Down syndrome (DS).

Objectives: To characterize neural habituation to repeated tones in children with typical development (TD), ASD, FXS, and DS.

Methods: We designed an auditory habituation paradigm with pure tones. Each trial contained *three* identical, 1000-Hz tones separated by 500 ms. These tones were analyzed as three conditions, namely First, Second, and Third. 20 children with FXS (27 – 78 months; 3 females; all with documented full mutation of FMR1), 28 children with ASD (32 – 83 months; 1 female), 26 children with DS (24 – 68 months; 11 females), and 46 typically-developing (TD) children (23 – 76 months; 9 females) contributed usable high-density EEG (≥ 40 trials per condition post-processing) while they were passively listening to these tones. Time windows for P2 (44 – 188 ms) and N2 (216 – 384 ms) components were determined via a cluster-based permutation test (Figure 1). The amplitude of P2 and N2 components were extracted from the event-related potential as the peak value within their respective window. Habituation was calculated as the amplitude difference between First and Third conditions (First – Third in P2 and Third – First in N2) and was compared to zero within each group using a one-sample t-test.

Results: We observed significant P2 habituation in the TD ($p=0.009$) and ASD ($p<0.001$) groups, but not in children with FXS ($p=0.194$) or with DS ($p=0.434$). The TD ($p=0.022$) and DS ($p=0.012$) groups also showed significant habituation in N2, but not the other two groups.

Conclusions: Typically developing children habituate to repeated tones in both P2 and N2 components in their auditory evoked response. Children with FXS showed no significant habituation in both components, while children with ASD or DS showed significant habituation in only one component. Future analyses will investigate whether degree of habituation is associated with clinical measures including language and cognitive development.



214.003 A Human Electrophysiological Biomarker of Fragile X Syndrome Is Shared in V1 of *Fmr1* KO Mice and Caused By Loss of FMRP in Cortical Excitatory Neurons

S. S. Kornfeld-Sylla¹, C. Gelegen Van Eijl², J. E. Norris³, F. A. Chaloner⁴, M. Y. Lee⁵, M. Khela⁶, M. J. Heinrich⁷, P. S. Finnie⁸, L. E. Ethridge⁹, L. M. Schmitt⁹, S. F. Cooke⁹, C. L. Wilkinson¹⁰ and M. F. Bear¹, (1)Picower Institute for Learning and Memory, Massachusetts Institute of Technology, Cambridge, MA, (2)Department of Basic and Clinical Neuroscience, Institute of Psychology, Psychiatry and Neuroscience, King's College London, London, United Kingdom, (3)Department of Psychology, University of Oklahoma, Norman, OK, (4)Centre for Developmental Neurobiology, Institute of Psychology, Psychiatry and Neuroscience, King's College London, London, United Kingdom, (5)Tufts University, Medford, MA, (6)University of Toronto, Toronto, ON, Canada, (7)Pediatrics, University of Oklahoma Health Science Center, Oklahoma City, OK, (8)Cincinnati Children's Hospital Medical Center, Cincinnati, OH, (9)Wolfson Sensory, Pain, and Regeneration Centre, King's College London, London, United Kingdom, (10)Department of Developmental Medicine, Boston Children's Hospital / Harvard Medical, Boston, MA

Background: One prominent feature of electroencephalogram (EEG) recordings measured in typically developing (TD) adults is a narrow-band oscillatory peak centered around 10.5 Hz. In Fragile X Syndrome (FXS), the leading inherited cause of intellectual disability and autism spectrum disorder, this “alpha rhythm” is altered, but the lack of an apparent correlate in *Fmr1* KO mice has limited study of the neurobiological basis for this biomarker.

Objectives: We seek to identify a comparable phenotype in the mouse model and investigate its mechanistic basis.

Methods: We use field potential recordings to compare altered physiology of occipital cortex across species. This included high-density (128 channel) EEG recordings from TD and FXS male adults (19-44 years, 20 per group) and children (2-7 years, 17 per group), skull-screw EEG electrodes in adult male wild-type (WT) and *Fmr1* KO mice (10-16 weeks, 11 per group), and local field potential (LFP) recordings from layer (L)4 of male WT and *Fmr1* KO mice (4-20 weeks, 67 per group). Custom spectral analysis code permitted unified analyses of these varied methodologies.

Results: Replicating previous reports, we find the center frequency of the narrow-band peak is shifted from ~10.5 Hz to ~7.5 Hz in EEG recordings of adults with FXS. A comparable narrow-band peak centered around 6 Hz is identifiable in skull-screw EEG resting state data of freely moving adult WT mice, and is shifted to ~4.5 Hz in *Fmr1* KO mice specifically in primary visual cortex (V1). Next, we recorded the LFP in L4 of V1 in awake, head-fixed mice viewing a dark or illuminated gray screen. This revealed: 1) a two sub-peak structure to these oscillations and 2) altered power and temporal dynamics of these oscillations in *Fmr1* KO mice. The addition of luminance enhanced power differences, especially in juvenile (4-6 week) mice. We observe a weakening of periodic alpha power in children, but not adults, with FXS.

Since inhibitory interneurons coordinate cortical oscillations and there is a deficiency of Parvalbumin (PV+) interneuron activity in FXS, we inhibited PV+ interneuron activity in WT mice while measuring the LFP in L4. We observed reduced power in the second, but not the first sub-peak of the low-frequency oscillation. Inhibition of Somatostatin (SOM+) interneurons reduced power in the first sub-peak. However, loss of FMRP solely in excitatory neurons and astroglia in cortex reproduced the L4 LFP phenotype.

Conclusions: The robust “alpha” biomarker of FXS patients is shared in V1 of *Fmr1* KO mice. Surface recordings in *Fmr1* KO mice reveal the shift in center frequency of the comparable oscillation, and intracortical LFP recordings further reveal power differences between genotypes that are enhanced by luminance and dependent on age. We also observe developmental differences in this biomarker in humans. While inactivation of different classes of interneurons in WT mice parallel the *Fmr1* KO mice phenotypes, loss of FMRP from cortical excitatory neurons alone is sufficient to reproduce the phenotype. This implicates altered inputs from excitatory neurons rather than the loss of FMRP in inhibitory neurons as the mechanistic basis, informing future therapeutic strategies.

214.004 Development of Abnormal Temporal Processing in the *Fmr1* Knock out Mice

K. A. Razak, University of California, Riverside, Riverside, CA

Background: Sensory sensitivity differences and delayed language functions are consistently seen in children with autism spectrum disorders (ASD). Auditory temporal processing is crucial for speech perception and language development. Abnormal development of temporal processing observed in children with ASD may lead to language impairments. To understand the cellular and circuit mechanisms underlying temporal processing differences requires an animal model, but Very little is known about the development of temporal processing in any animal model of ASD.

Objectives: The major objectives of this study were to quantify development, sex differences and hemispheric asymmetries in temporal processing in a mouse model of Fragile X Syndrome (FXS), a leading known genetic cause of ASD.

Methods: Epidural screw electrode electroencephalogram (EEG) recordings were obtained from awake and freely moving WT and Fmr1 KO mice. Recordings were obtained at postnatal day (P)21, 30 and in young adults of both sexes. For hemispheric differences analysis, skull 30 channel multielectrode array recordings were obtained from male adult mice. Spectrotemporally dynamic chirps, 40 Hz auditory state responses (ASSR) and 40 Hz gap-in-noise ASSR were recorded. Intertrial phase coherence (ITPC) was quantified to determine trial to trial consistency of phase locking to stimulus temporal aspects.

Results: In P21 and adult WT mice, MEA recordings show higher ITPC in the left hemisphere compared to the right at gamma frequencies (40-80 Hz) in both ASSR and chirp responses. Such hemispheric differences were not seen in Fmr1 KO mice. In the KO mice, ITPC was lower compared to WT mice for all stimuli. Epidural EEG recordings show sex differences in ITPC for gap-in-noise ASSR, with male KO mice showing reduced ITPC at P21 and P30, but female KO mice only showing deficits at P21. No sex differences were seen in WT mice at any age.

Conclusions: These analyses reveal reduced fidelity of responses across trials to both gap-in-noise stimuli and spectrotemporally dynamic chirps. Increased trial-to-trial variability of responses is present from early development in mice (~P21), but female KO mice temporal processing matures faster than in males. The lack of sex differences in WT mice indicates that the observed sex differences in the Fmr1 KO mice is specific to the genotype. Hemispheric differences in fast temporal processing in humans is related to speech processing, with a strong link between gamma band oscillations and parsing of speech input in the phoneme range. Therefore, our observed differences in gamma band ITPC suggests a bridge between animal work and language development in ASD. Future studies should examine hemispheric differences in ASSR and chirp stimuli in children with FXS to identify potential correlations with language function.

Panel Session

215 - Cultural Adaptation for Improving Equity in Autism Screening and Service Access across Systems and Settings

May 2nd, 2025, 2:00 PM - 4:00 PM - 6A

Panel Chair: Shana Attar, *Psychology, University of Washington, Seattle, WA*

Discussant: Alice Carter, *Department of Psychology, University of Massachusetts Boston, Boston, MA*

Culturally and linguistically diverse (CLD) families often experience greater challenges accessing timely, autism-specialized care relative to non-CLD families, and as a result, experience less optimal health outcomes. Factors contributing to these health disparities include a dearth of both culturally and linguistically adapted measures suitable for autism-specific developmental surveillance and educational materials appropriate for service navigation. This panel presents four independent research studies that employ culturally-adapted measures or educational materials and examine their effectiveness and/or feasibility. Taken together, these studies represent considerable efforts to improve the cultural sensitivity of early autism identification and service navigation processes across systems (e.g., educational, medical) and settings (e.g., community-based organizations and primary care), and serve as important models for moving forward.

Introduction

S. M. Attar, *University of Washington, Boston, MA*

215.001 Development and Evaluation of a Culturally-Adapted Autism Diagnosis Model for Young Children in Western Kenya

K. Fauntleroy-Love¹, **C. Saina**^{2,3}, **E. Oyungu**^{2,3}, **A. Nafiseh**¹, **M. McHenry**¹ and **R. McNally Keehn**¹, (1)*Pediatrics, Indiana University School of Medicine, Indianapolis, IN*, (2)*Moi Teaching and Referral Hospital, Eldoret, Kenya*, (3)*Moi University, Eldoret, Kenya*, (4)*University of California San Francisco, San Francisco, CA*

Background: Ninety-five percent of the world's autistic children live in low and middle-income countries (LMIC), yet there is virtually no data on autism in these settings. This is due in large part to a lack of neurodevelopmental expertise and resources including available diagnostic tools. Easy-to-administer, culturally-appropriate, open-source assessment approaches are key to improving autism detection and diagnosis in LMIC.

Objectives: To develop and conduct a pilot implementation of an evaluation model for the diagnosis of young children at increased likelihood for autism in a public hospital in western Kenya. Specifically, we sought to: 1) culturally adapt the ASD-PEDS, an observational assessment tool, 2) field test use of the adapted ASD-PEDS, and 3) implement the ASD-PEDS within a diagnostic evaluation model.

Methods: This study was conducted at Moi Teaching and Referral Hospital (MTRH) in Eldoret, Kenya in partnership with the Academic Model Providing Access to Healthcare (AMPATH) program. The ASD-PEDS is an open-source tool developed for the observation of autism characteristics in young children. Following forward and backward (English-Kiswahili) translation of the ASD-PEDS, cognitive interviews were conducted with Kenyan clinicians (n=5) and caregivers of young children (n=5) by trained Kenyan facilitators. Interviews assessed culturally normative social communication and play behaviors and cultural relevance of ASD-PEDS tasks, materials, and administration instructions. Interviews were translated, transcribed, and analyzed for key qualitative themes and data-driven adaptations were made to the ASD-PEDS. The ASD-PEDS was then field tested with 20 children ages 2-7 years (mean age: 46 months; 65% with a previous clinical diagnosis of autism) by trained research personnel (with live supervision by RMK) during which iterative refinements to enhance cultural relevance were made. Finally, two physicians were trained in best-practice autism evaluation, including use of the ASD-PEDS to inform overall clinical diagnosis of 48 children (mean age: 51 months; 81% with autism diagnosis outcome) in MTRH pediatrics and psychiatry clinics.

Results: Results of cognitive interviews suggested that early emerging social communication skills such as joint attention, requesting, and use of non-verbal communication strategies are culturally normative in Kenya. Considerations for adaptation of ASD-PEDS included offering culturally appropriate snacks, inclusion of culturally familiar play routines, and adapting the clinical environment to support the comfort of children and caregivers. In field testing, ASD-PEDS categorical risk matched the child's diagnosis in 100% of cases (n=13 autism; n=7 non-autism). When the ASD-PEDS was used as part of the MTRH clinical evaluation model, ASD-PEDS categorical risk matched child clinical diagnosis determined by physician clinical judgment in 100% of cases (autism: n=39, ASD-PEDS total score mean: 19, clinician high diagnostic certainty: 95%; non-autism: n=8; ASD-PEDS total score mean: 9, clinician high diagnostic certainty: 12%).

Conclusions: The ASD-PEDS is a promising tool for use in resource-constrained and LMIC settings. The ASD-PEDS assays early emerging social communication and play behaviors, requires minimal adaptation, can be used by non-specialist clinicians to inform diagnosis, and fits well within a standard autism evaluation protocol. Adaptation and validation of diagnostic assessment tools has the significant potential to advance autism clinical care and research in LMIC.

215.002 Leveraging Community-Based Organizations to Connect Culturally and Linguistically Diverse Families to Autism Identification and Support Services: A Pilot Feasibility Trial of a Novel Co-Designed Navigation Program

S. M. Attar, H. Benavidez and W. L. Stone, Psychology, University of Washington, Seattle, WA

Background: Healthcare and early educational systems are usual entry points for autism diagnostic and specialized services, yet culturally and linguistically diverse (CLD) families are less likely to have timely or consistent interactions with these two systems. Alternative pathways to autism-specialized care are urgently needed to increase access to evidence-based autism-specialized care and to improve health equity for CLD families. Community-based organizations (CBOs) frequently serve as an entry point for many underserved populations to access housing, vocational, educational, and health information more easily and comfortably than governmental or traditional medical facilities, yet they are underutilized in autism service provision. As such, the features of an alternative pathway to access autism services within the setting of a CBO that would best serve CLD families remain unclear.

Objectives: (1) To co-design a CBO-based pathway to access autism services in partnership with CLD families and CBO staff; (2) To examine the implementation outcomes of using non-specialist providers to administer the novel, co-designed program.

Methods: First, we initiated a co-design process within a CBO that supports refugees and immigrants to the US. Participants included seven non-specialist providers, two program supervisors, two organization leaders, eight caregivers of children aged 16 months - 5 years old, and four autism specialists. Eight, two-hour co-design sessions were conducted over six months. Second, six multilingual non-specialist providers completed a self-paced, web-based training tutorial on the novel program and delivered the curriculum across four sessions to 35 culturally and linguistically matched families with children aged 0-5 at increased autism likelihood. Seven language groups were represented across both the co-design and pilot: Somali Mai Mai, Swahili, Arabic, Dari/Pashto, French (African dialects), Amharic, and Tigrinya. The non-specialist providers and caregivers completed surveys and participated in a feedback session at the conclusion of the pilot.

Results: The co-design sessions revealed five key design features of an effective pathway for increasing access to autism identification and services for CLD families; see **Table 1**. These considerations informed the co-production of a modular and flexible workbook ("The Family Care Project"; FCP) and an associated self-paced, web-based tutorial for use by CLD non-specialist providers with caregivers. All non-specialist providers who participated in the feasibility pilot strongly agreed that the FCP aligned with their role as a service provider and was easy to use; 100% of caregivers strongly agreed that the FCP was relevant for their families. Six months after the pilot concluded, all non-specialist providers report continued use of the FCP, with an additional 24 families having participated in the FCP to date.

Conclusions: The five design features identified by co-design members highlight the key importance of adapting both the content and the delivery of psychoeducational materials and services for CLD families. Pilot results suggest that a low-resource and culturally-sensitive curriculum administered by culturally-matched non-specialist providers in non-profit community organizations is appropriate, feasible, and sustainable. This pilot lays the foundation for programmatic changes in the services and settings available to support CLD communities during autistic children's early years and thereby improve child and caregiver outcomes and health equity.



215.003 Cognitive Pretesting: An Approach to Address Autism Research Disparities Among Families with Limited English Proficiency

D. J. Abate¹, A. W. Lu², L. Rivas Vazquez³, H. Tran⁴, X. Yang⁵, C. Tran⁴, N. Julceus Fabien⁵, O. J. Lindly⁶, K. E. Wallis⁷, K. Zuckerman⁸ and S. Broder-Finger⁹, (1)E. K. Shriver Center, E. K. Shriver Center, University of Massachusetts Medical School, Worcester, MA, (2)Department of Pediatrics, Oregon Health & Science University, Portland, OR, (3)Department of Pediatrics (Division of General Pediatrics), Oregon Health & Science University, Portland, OR, (4)Department of Pediatrics, Oregon Health and Science University, Portland, OR, (5)UMASS Chan Medical School, Worcester, MA, (6)Health Sciences, Northern Arizona University, Health Sciences Department, Flagstaff, AZ, (7)Center for Autism Research, Children's Hospital of Philadelphia, Philadelphia, PA, (8)Division of General Pediatrics, Oregon Health & Science University, Portland, OR, (9)UMASS Medical School, Boston, MA

Background: Families who are dually impacted by autism spectrum disorder (ASD) and limited English proficiency (LEP) face substantial barriers to care yet have been systematically excluded from disparities research^{1,3}. Very few parent-reported measures of ASD treatment mediators or outcomes have been validated in languages other than English or Spanish, with research illustrating that healthcare disparities may be greater for LEP families who do not speak either language^{4,6}. To overcome these challenges in understanding the relationship between LEP status and service use disparities, we developed the Limited English Proficiency and Family Experiences with Autism Project (LEAP) Survey to validate measures of autism service utilization in five languages.

Objectives: The purpose of this study was to conduct cognitive pretesting of a preliminary draft of the LEAP Survey. Cognitive pretesting will identify elements of the LEAP Survey that impact its acceptability, accessibility, and understandability with English-speaking and LEP caregivers of autistic children.

Methods: 15 caregivers of autistic children aged 5-12 years were recruited from community organizations in Massachusetts and Oregon to complete cognitive pretesting in their primary language (Chinese ($N = 3$), English ($N = 10$), Haitian Kreyol, Spanish ($N = 1$), Vietnamese ($N = 1$)) via Zoom. Caregivers viewed each section of the LEAP survey and were instructed to utilize a think-aloud method⁷, where they read each survey item and were asked to both answer the question and to provide section-specific critiques. Caregiver feedback was documented and categorized according to whether they addressed survey phrasing, section-specific probing questions, or survey design.

Results: Caregivers reported the following limitations with the preliminary LEAP Survey draft: (1) Comprehension difficulties due to the use of improper phrasing, tone, or sentence complexity in specific survey questions; (2) Cultural and linguistic influence on familiarity with autism services, medications, and providers; and (3) Design issues including repetitive response options for validated survey measures and a visually taxing layout. Table 1 depicts examples of caregiver feedback.

Conclusions: English-speaking and LEP caregivers of autistic children identified limitations of the initial LEAP Survey that impacted their ability to answer questions about their autism service utilization. Cognitive pretesting of the internet-based and telephone modalities of the LEAP Survey will be conducted to further revise the survey before it is piloted.

**215.004 A Framework for Developing Culturally-Sensitive Caregiver-Report Autism Screening Measures**

M. Chiu¹, S. M. Attar², A. S. Carter³ and W. L. Stone², (1)University of Washington, Maple Valley, WA, (2)Psychology, University of Washington, Seattle, WA, (3)Department of Psychology, University of Massachusetts Boston, Boston, MA

Background: Universal autism screening is intended to serve as an early opportunity to identify children with autism characteristics and promote access to timely autism-specialized services. Indeed, children with a positive autism screen receive a diagnosis and access to specialized services seven-months to two-years earlier than children with a false negative or missed screen. However, autistic children from culturally and linguistically diverse (CLD) families are more than twice as likely to be incorrectly identified on autism screening measures in comparison to non-CLD children, delaying access to critical autism-specialized care. One factor contributing to inequitable autism identification is that current screening tools have been validated primarily on White families and may not be sensitive to how CLD caregivers interpret screening questions or what their expectations are for normative social behavior of their children. While there has been previous work developing culturally-sensitive measures, there has been limited research that describes a systematic process for generating autism measures that are intended to be culturally-sensitive from their inception.

Objectives: To develop and assess a framework for generating a culturally-sensitive caregiver-report autism screening measure that is highly predictive of autism likelihood.

Methods: We developed a pilot pictorial screening tool to identify toddlers at increased likelihood for autism. In this pilot tool, eleven social communication behaviors associated with autism (e.g., reciprocal play, use of facial expression, imitation) are presented along with photos and brief text illustrating each behavior; **see Figure 1** for an example item. We employed two Plan-Do-Study-Act (PDSA) cycles to solicit feedback from CLD communities and allow us to adjust the behaviors, photographs, and item wording as needed. PDSA employs an iterative process that focuses on the translation of ideas into appropriate action by repeatedly soliciting feedback from end-users throughout development. Two nonprofit community-based organizations that serve African and Middle Eastern immigrants and refugees and Black Americans assisted with recruitment. During the two PDSA cycles, we conducted focus groups with different CLD caregivers of children aged 16-35 months. Additionally, caregivers completed the pilot version of the initial items and a Likert-scale survey assessing the usability and acceptability of the items. Nonprofit providers (i.e., program staff working directly with CLD families) also completed a survey about the items.

Results: 115 caregivers completed surveys and participated in one of 12 focus groups. Eight focus groups were facilitated through an interpreter who spoke either Arabic, Somali Mai-Mai, Dari, French, or Swahili. Five providers completed surveys. Mixed-methods analyses revealed that aspects of six of the 11 social communication behaviors required adjustment. Thematic analysis of the focus group transcripts resulted in three themes; **see Table 1**. Frequencies of the specific social communication behaviors that caregivers most commonly expect within their communities were tallied; **see Table 2** for an example.

Conclusions: PDSA cycles paired with mixed-methods analyses to systematically assess the cultural sensitivity of screening items from multiple end-users (i.e., providers and caregivers) results in rich feedback that informs essential revisions to the development of screening items. This process may provide a model for the future development of culturally sensitive measures.



Panel Session**216 - Using Digital Phenotyping Techniques to Assess Autism Severity**

May 2nd, 2025, 2:00 PM - 4:00 PM - 611-614

Panel Chair: Ilan Dinstein, *Cognitive and Brain Sciences Department, Ben Gurion University, Beer-Sheva, Israel*

Digital phenotyping techniques utilizing computer vision, speech analysis, and wearable devices are now enabling researchers to study the behavior of autistic children in novel ways in every day locations including the clinic, classroom, and at home. These techniques offer exciting opportunities for measuring the severity of core autism symptoms and co-occurring symptoms in direct and objective ways. The panel will present a tour-de-force of multiple research approaches and initial findings.

Introduction**I. Dinstein**, *Psychology Department, Ben Gurion University, Beer Sheva, Israel***216.001** Differences in Infant-Caregiver Interaction Are Present in Autism from the First Postnatal Months

A. L. Ford¹, L. Lang², G. Berman³ and **S. Shultz⁴**, (1)Marcus Autism Center, Emory University School of Medicine, Marcus Autism Center, Atlanta, GA, (2)Neuroscience, Emory University, Atlanta, GA, (3)Department of Biology, Emory University, Atlanta, GA, (4)Marcus Autism Center, Emory University School of Medicine and Children's Healthcare of Atlanta, Atlanta, GA

Background:

From birth, newborns and caregivers exhibit species-typical behaviors—that is, repeated patterns of behavior that are highly uniform across infant-caregiver dyads—that create critical opportunities for social interaction and newborn learning. These behaviors are mutually-adapted and mutually-reinforcing, progressively advancing cycles of learning. Despite the critical role of infant-caregiver interaction in guiding social development, few studies have examined how autism may alter this early-emerging and foundational learning process.

Objectives:

Here we: 1) leverage advances in computer vision and machine learning to detect—in an automated, data-driven approach—the repertoire of species-typical behaviors produced during infant-caregiver interactions from birth to 6 months, and 2) quantify differences in behaviors produced by infants and caregivers in dyads with an infant later diagnosed with autism (AUT) compared to dyads with a neurotypically-developing (NT) infant.

Methods:

Video recordings of screen-mediated infant-caregiver interaction were collected longitudinally from birth to 6 months. Infant outcome (NT or AUT) was ascertained by clinical assessment at 24-36 months. The sample consisted of 88 NT dyads (44 female, 179 sessions) and 38 AUT dyads (15 female, 80 sessions).

Behaviors of infants and caregivers were identified using markerless tracking of facial features via DeepLabCut and nonlinear mapping of behaviors via MotionMapper (Figure 1), allowing for high-throughput and reliable identification of species-typical behaviors with minimal *a priori* assumptions. Identified behaviors were reviewed to confirm ecological validity with canonical dyadic behaviors and developmental trends in behavior change. Change in infant and caregiver behavior was examined across four age groups: 0-1.5, 1.6-3, 3.1-4.5, and 4.6-7 months (Figure 2.1) and NT versus AUT differences in frequency of behaviors were identified using hierarchical bootstrapping (Figure 2.2).

Results:

Age-effects: Behavior density maps showed clear age-related shifts in the species-typical behaviors performed by infants and caregivers (Figure 2.1). Visualization of behavior maps showed that younger infants displayed more head turning and tilting behaviors, with more stable head positioning and mouth movements observed as infants aged. Interestingly, these infant behavior changes mirrored some of the changes among caregivers (caregivers displayed more side-to-side head movements when their infants were younger and more stationary head positioning and mouth movements as their infants aged).

NT versus AUT differences: 6 (out of 37) caregiver behaviors were significantly different between NT and AUT dyads ($p < 0.05$), and 25 behaviors showed large effects sizes (Cohen's $d > 0.8$). No infant behaviors were significantly different, but 8 (out of 34) had large effects sizes (Cohen's $d > 0.8$). Visualization of behavior maps showed that infants and caregivers in AUT dyads had a higher representation of behaviors more common amongst younger (0-1.5 month) dyads and less representation of behaviors more common amongst older (4.6-7 month) dyads, suggesting possible delays or disruptions in the emergence and/or refinement of social interactive behaviors over infants' first 6 postnatal months.

Conclusions:

Data-driven identification and quantification of interactive behavior shows that robust differences in infant-caregiver interaction are present in dyads with an infant later diagnosed with autism from the earliest postnatal months, altering this most critical platform for infant social learning.

**216.002** Objectively Measured Speech and Movement Characteristics in the Classroom Distinguish Preschoolers with Autism Spectrum Disorder

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Background: Autism spectrum disorder (ASD) is characterized by social communication differences, including atypical patterns of interpersonal movement and vocalization. Inclusion classrooms, where autistic and neurotypical children are educated together, are an understudied naturalistic context for examining potential differences in such behaviors. We use a data-driven approach to identify and quantify behavioral markers of ASD by analyzing social movement and vocalization patterns in real-world environments.

Objectives: Leverage high-density, longitudinal datasets to explore objective features of preschoolers' classroom movements and vocalizations that may distinguish autistic (ASD) children from neurotypical (TD) children.

Methods: We observed 56 preschoolers (26 ASD, 30 TD) from eight inclusion classes. Children's real-time vocalizations and classroom movements were tracked using LENA DPL recorders and Ubisense Ultra-Wideband Radio-Frequency Identification (RFID) tags (respectively) worn in vests. Overall, 390 observations ($M=103$ minutes) were collected (135 ASD, 255 TD). Child speech and social movement features were first entered into a set of machine learning models. The optimally performing model identified variables that best distinguished ASD and TD observations. The top performing variables were then individually analyzed with mixed-effects models (observations nested in children nested in classrooms) to test for ASD and TD differences.

Results: The best performing model utilized a Light Gradient-Boosting Machine (LightGBM) framework, which builds decision trees iteratively to minimize prediction error. The model correctly identified 24 ASD (true positives) and 22 TD (true negatives) cases while incorrectly identifying 8 ASD (false positives) and 2 TD cases (false negatives), achieving 82.1% agreement; Kappa=0.65, 95% CI: 0.45 – 0.84. The most frequent prediction across a child's observations yielded the child's final predicted classification (i.e., ASD or TD). The five variables that best distinguished observations in order of importance were average peak loudness (dB) of a child's vocalizations; the proportion of a child's proximal contact (≤ 1 m interpersonal distance) spent with teachers; the average loudness (dB) of a child's vocalizations; the proportion of a child's proximal contact spent with neurotypical peers; and a child's mean velocity toward a partner in the 2.5 seconds preceding social contact. Compared to children with TD, autistic children exhibited lower average peak vocalization loudness ($p<.001$) and quieter average vocalization loudness ($p=.001$); they spent a larger proportion of proximal time with teachers ($p<.001$) and a smaller proportion of proximal time with neurotypical peers ($p=.024$); and they approached social partners significantly faster ($p<.001$; **Table 1 & Figure 1**).

Conclusions: Speech characteristics and social movement behaviors in everyday inclusion preschools distinguished children with ASD from children with TD, with some tendency to over-identify ASD. Follow-up models accounting for nesting indicated that children with ASD showed lower peaks of vocalization loudness and were quieter on average than neurotypical peers. Autistic children approached social partners more quickly and spent more time in proximal contact with teachers—but not with neurotypical peers—compared to children with TD. These findings illustrate the potential of combining interpretable machine learning models with statistical modeling to better understand the ASD phenotype in natural environments in which children with and without ASD spend large quantities of time.



216.003 Fully Automated AI Measurement Demonstrates Reduced Nonverbal Interpersonal Coordination in Autism

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Background: Interpersonal coordination contributes to social communication success, and reductions in autism have been demonstrated across domains (e.g., rhythmic tapping, body movements, facial expressions). There is no universally-accepted operationalized definition or method for quantifying interpersonal coordination. Most existing statistical methods are correlation-based and assume correlations between signals are linear, restricting the patterns that can be explored and preventing quantification of coordination within multidimensional crossmodal data (e.g., head movements with facial expressions). Artificial intelligence (AI) offers promising solutions, but has been under-utilized because of the need for gold-standard training labels. We developed a new AI approach – concurrence-based coordination – that overcomes these limitations by using a self-supervised deep learning architecture to automatically expose statistical dependences between multi-dimensional time series. Furthermore, while prior machine learning work has focused on diagnostic classification, our method provides individual coordination scores that can be analyzed with traditional statistics for group differences and dimensional properties.

Objectives: 1) Quantify and compare nonverbal interpersonal coordination in individuals with neurotypical development (NT), autism (AUT), or (an)other psychiatric condition(s) (e.g., ADHD, anxiety, depression; PSY); 2) Explore robustness of our method to conversational and recording context; 3) Test coordination's associations with two hypothesized developmental building blocks: mutual gaze and imitation ability.

Methods: 430 individuals participated in a brief video-recorded conversation with a research partner, either in a lagless (not over internet) Zoom-like video set-up ("room-to-room", main sample), or in-person face-to-face (replication sample). Time series data from 3 head movement parameters and 79 facial expression signals were generated via computer vision for both participant and partner. Time series were segmented into overlapping 4-second windows. A deep-learning algorithm was trained to separate participant and partner segments that are concurrent (temporally aligned) vs. non-concurrent (temporally misaligned between participant and partner), defining coordination as any statistical dependence between signals. The output was a single coordination score (higher score=more coordinated), which was the dependent variable in linear mixed models controlling for age, sex, and cognitive ability among 12–18-year-olds (Table 1).

Results: AUT demonstrated significantly lower coordination compared to both NT (*unadjusted Cohen's d*=0.95, $p<0.0001$) and PSY ($d=0.48$, $p<0.05$) in the room-to-room sample (Figure 1). The AUT<NT effect was replicated in the face-to-face sample ($d=0.7$, $p<0.05$). When face-to-face and room-to-room samples were matched on age, sex, and IQ and combined in a single linear model, there was no group-by-context interaction ($p=0.13$), suggesting group differences are robust to recording context; though, there was a significant main effect of context, with greater coordination in room-to-room ($d=0.49$, $p<0.05$). Within a subset of the face-to-face sample, coordination was positively associated with mutual social gaze between partners during the conversation ($r(102)=0.43$, $p<0.0001$) and gross motor imitation ability assessed in a separate task ($r(31)=-0.44$, $p<0.05$).

Conclusions: Nonverbal interpersonal coordination reductions in autism were quantified using a fully automated method and were robust to recording context. Interpersonal coordination was associated with two hypothesized preconditions of coordination: mutual gaze and motor imitation ability. Future work should explore the clinical utility of this automated coordination score in establishing autism diagnoses and tracking treatment effects.



216.004 Quantifying Behavior with Automated Computer Vision Analyses of ADOS-2 Video Recordings

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Background: Current techniques for estimating the severity of core autism symptoms in children are based on subjective reports from clinicians, teachers, and parents who often do not agree. Variability across reporters with no clear ground truth hinders research into the underlying mechanisms of autism and impedes clinical trials searching for effective interventions. The growing availability of video recordings of autistic children offers an opportunity to develop new computer vision techniques for identifying and quantifying behaviors such as stereotypical movements and facial expressions that are expected to differ in autistic children. Here we present data from several recently developed algorithms that quantify such behaviors in ADOS-2 video recordings from the Azrieli National Centre for Autism and Neurodevelopment Research (ANCAN). **Objectives:** To assess the accuracy and reliability of computer vision algorithms in identifying and quantifying stereotypical movements and facial expressions of children, while comparing findings across children with and without autism.

Methods: Since 2015, ANCAN has been collecting longitudinal data from children with autism diagnosed in nine clinical sites throughout Israel. As part of this effort, over 2000 children with autism, 1-8-years-old, have completed Autism Diagnostic Observation Schedule, 2nd edition (ADOS-2) assessments that were recorded with 2-5 video cameras. In **project 1** we manually annotated >7300 exemplars of stereotypical movements from video recordings of 241 autistic children, enabling us to train a CNN deep learning algorithm (ASDMotion) to identify and quantify stereotypical movements. We demonstrate the accuracy of the algorithm using precision and recall metrics. In **project 2** we report results from 3 existing algorithms designed to identify facial expressions (FaceReader, iMotions, and PyFeat). So far videos of 100 children (72 with autism) were analyzed. We assessed the agreement across algorithms in identifying 6 facial expressions while comparing their quantities across autism and control participants with ANCOVA analyses, controlling for age and sex.

Results: The ASDMotion algorithm accurately detected >92% of manually annotated stereotypical movements with a precision of >66%. When assessing the total number of stereotypical movements per child in an independent dataset there was a highly significant correlation between the number of movements estimated by ASDMotion and manual annotation ($r=0.8$, $p<0.001$). Identification of facial expressions by the three facial analysis algorithms differed significantly across algorithms ($F(2, 294) = 64.09$, $p < 0.001$). Despite differences across algorithms, there were no significant differences across autism and control groups in the quantity of facial expressions during ADOS-2 assessments.

Conclusions: Initial analyses reveal promising results and challenges in the development of algorithms that quantify behaviors relevant to the severity of core social and RRB symptoms of autism. While stereotypical movements seem to be accurately quantified by the ASDMotion algorithm, facial expressions seem difficult to quantify reliably with existing algorithms. Moreover, quantifying relevant differences in facial expressions across autism and control participants may require development of algorithms that quantify the quality of facial expressions (e.g., flatness) in addition to their number/frequency. Further development of these and additional algorithms are highly warranted for establishing new techniques for quantifying behavior objectively and directly from autistic children.

Panel Session**217 - Physiological Indicators and Neural Mechanisms of Dysregulated Emotional Profiles in Autistic Youth**

May 2nd, 2025, 2:00 PM - 4:00 PM - 608-609

Panel Chair: Rachel McDonald, Department of Psychology, Montclair State University, Montclair, NJ

Discussant: Matthew Siegel, Boston Childrens Hospital, Boston, MA

This session will focus on examining physiological indicators and neural mechanisms associated with dysregulated emotional profiles in autistic youth across broad age ranges. The panel will present a range of distinct objective measurement approaches (e.g., EEG, heart rate variability, MRI, or RSA), and demonstrate their links to behaviorally expressed dysregulation. Specifically, talks will span topics such as, delta-beta coupling (e.g., brain wave coherence) predicting emotion dysregulation, how depressive and anxious profiles related to structural differences in the brain, and how respiratory sinus arrhythmia-reactivity relates to emotion and behavioral dysregulation. In addition, the panel will also feature findings on the use of physiological data to inform treatment approaches, including the use of heart-rate variability to predict treatment effectiveness. In sum, these presentations seek to inform clinicians and scientists about neuroscientific and physiological approaches that can be used to inform clinical presentations of emotion dysregulation, and thereby informing relevant treatment approaches for mental health conditions in autistic people.

Introduction

R. G. McDonald, Center for Autism and Related Disorders, Montclair State University, Baltimore, MD

217.001 Toward a Biopsychosocial Model of Emotion Dysregulation and Behavior Problems in Autism

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Background: Behavioral challenges represent a key obstacle to functioning and well-being for children with autism, interfering with learning opportunities and social relationships, and increasing distress for the children and those who support them. Emotion dysregulation has been proposed as an underlying mechanism for behavioral disruption in this population, but little is known about its development in autistic children or contributors to related processes. The current examination takes a biopsychosocial approach to testing competing models involving interactions between child and family factors in the emergence of regulatory competence and behavioral functioning in autistic children. A recent examination (Baker et al., 2020) predicted externalizing problems in children with autism from an interaction between negative parenting and higher child respiratory sinus arrhythmia reactivity (RSA-R), or withdrawal of parasympathetic influence in response to challenge. A likely mechanism by which this process might unfold would be through child emotion dysregulation and, indeed, some concordance has been established between higher RSA-R and more concurrent observed emotion dysregulation in this population (Baker et al., 2022). It is possible that RSA-R may underlie or contribute to greater emotion dysregulation, which in turn may eventuate in more difficulties with behavioral functioning. Given this conceptualization, a central remaining question is where moderation by parenting might occur in the causal chain.

Objectives: We compared contrasting models in which: 1) child RSA-R and negative parenting interact to predict observed child emotion dysregulation, and 2) child observed emotion dysregulation and negative parenting interact to predict child externalizing problems.

Methods: A sample of 61 children (74% male) with ASD aged 6 to 10 years participated in laboratory activities to examine physiological baseline and to assess independent child emotion dysregulation and physiology in response to challenge. Children were diverse with regard to ethnicity (33% Caucasian, non-Hispanic), socioeconomic status, ASD symptom levels, and cognitive functioning (IQ range 47-121). RSA was collected with a wired MindWare system and RSA-R represented decreases in respiratory sinus arrhythmia from baseline to the challenge task. Negative parenting was an average of scores coded from a speech sample (total number of critical comments) and from parent report of harsh discipline. Emotion dysregulation was coded from videotape and included global dimensions outlined by Cole et al. (1994; ICC = .91). Primary caregivers reported on their children's symptoms of oppositional defiant disorder and broad externalizing problems.

Results: Regressions controlling for child age, autism symptom levels (ADOS-2), and family income (no other covariates were necessary) revealed a significant interaction between RSA-R and negative parenting in the prediction of independent child dysregulation, $\beta=.37$, $t=2.77$, $p=.008$. Higher RSA-R was related to more observed dysregulation in the context of high, $t=3.59$, $p<.001$, and moderate, $t=2.05$, $p=.04$, but not low negative parenting, $t=-0.92$, $p=.36$. The interaction between observed emotion dysregulation and negative parenting in the prediction of children's externalizing symptoms was not significant, $\beta=.15$, $t=0.63$, $p=.53$.

Conclusions: Findings suggest that critical or harsh parenting may amplify the risk for emotion dysregulation in autistic children with higher physiological reactivity. Implications for successful parent-child co-regulation will be discussed.

217.002 Emotion Dysregulation: Examining the Predictive Utility of Delta Beta Correlations in Autistic Youth

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Background: Emotion dysregulation (ED) occurs when there is a mismatch between felt/expressed emotions, choice of regulation strategy, and the environmental context (Gross et al., 2002). Autistic youth experience more severe ED as compared to both neurotypical youth and youth with other psychiatric conditions (McDonald et al., 2024). Research in non-autistic youth has explored how disrupted relationships between slow (delta) and fast (beta) brain waves indexed by electroencephalogram (EEG) are related to greater ED, where different patterns of coherence between delta/beta reflect dysregulation (Myruski et al., 2022). However, no research to-date has examined this relationship in autistic youth, despite higher rates of dysregulation, including behaviorally expressed (e.g., emotional reactivity), negative mood states (e.g., emotional dysphoria), and general lability (e.g., emotional control). Understanding relationships between neural mechanisms and behaviorally expressed emotions can assist in clarifying constructs, which in turn may strengthen their validity and lead to better treatment specificity.

Objectives: The current project examined the relationships between delta-beta couplings (DBC) and emotion dysregulation profiles (e.g., reactivity, control, and dysphoria) in autistic and non-autistic youth.

Methods: Seventy-four youth (43 autistic; Range-IQ: 57-140) participated in a study in a metropolitan area in northeastern US ($M_{age}=9.9$, $SD_{age}=3.0$; 55.1% male, 6.1% Black/African American, 6% Asian, 1.5% Native American, 6.1% MENA, 24.2, Multiracial, 50% White, & 6.1% Other). Youth completed an 8-minute resting-state EEG paradigm alternating between eyes open or closed. Delta and beta waves were recorded in the frontal (Fz, F3, F4), central (Cz, C3, C4), and parietal (Pz, P3, P4) regions. DBCs closer to zero, after calculating residuals (delta predicting beta), indicate better coherence (Myruski et al., 2022). Emotional dysphoria, reactivity, and control were examined via parent report (Emotion Dysregulation Index; Mazefsky et al., 2018; BRIEF-2; Gioia et al., 2015).

Results: Regional DBC were associated with one another ($ps <.05$). Linear regressions suggest that DBC did not predict ED in non-autistic youth. In autistic youth, less central ($b<-.75$, $p<.04$) and greater parietal ($b>.54$, $p<.04$), but not frontal, DBC coherence predicted more reactivity and dysphoria. Lower central ($b=-1.08$, $p=.002$), but greater parietal ($b=.72$, $p=.008$) and frontal ($b=.53$, $p=.03$) DBC coherence predicted more difficulty with emotional control.

Conclusions: Results suggest that in community samples of autistic youth, but not non-autistic youth, disruptions in DBC may relate broadly to ED. Specifically, lower central greater parietal DBC coherence may relate to reactivity, dysphoria, and control. These findings provide some evidence that greater neural resources may be dedicated to parietal regions, and thus regulating emotions, even at rest in autistic youth. Lower DBC coherence in central regions relates to more ED, which could in part reflect the impact of dysregulated sensory centers have on emotions (Simon et al., 2017). Lastly, greater frontal DBC coherence was related to more emotional control only, reflecting increased resources needed to choose/deploy appropriate regulation strategies to control emotional lability in autistic youth. Future work should continue to explore how DBC relates to ED presentations and downstream impacts on mental health in autistic youth.

217.003 White Matter Microstructural Organization Associated with Depressive Symptoms in Autistic Children in the ABCD Study
P. D. Radoeva¹, **C. Elizardo**¹, **R. G. McDonald**², **J. I. Hunt**³, **S. Deoni**⁴, **S. J. Sheinkopf**⁵, **C. A. Mazefsky**⁶, **D. P. Dickstein**⁷ and **N. S. Philip**³, (1)Bradley Hospital, East Providence, RI, (2)Department of Psychology, Montclair State University, Montclair, NJ, (3)Warren Alpert Medical School of Brown University, Providence, RI, (4)King's College London, London, United Kingdom, (5)Thompson Center for Autism & Neurodevelopment, University of Missouri, Columbia, MO, (6)Department of Psychiatry, University of Pittsburgh School of Medicine, Pittsburgh, PA, (7)Harvard Medical School, Boston, MA

Background: Mood problems, including depression, occur more frequently in autistic children as compared to neurotypical peers. Altered white matter microstructure has been reported in non-autistic youth with depression. No prior studies have reported on the white matter microstructural correlates of depressive symptoms in autistic children, and only one prior study has explored this association in autistic adults (Mohajer et al, 2019).

Objectives: The goal of our data analysis was to investigate the white matter microstructural organization associated with depressive symptoms in autistic children in the ABCD study. We hypothesized that decreased microstructural organization in limbic and fronto-frontal and fronto-thalamic circuits may be associated with more severe depressive symptoms in autistic youth.

Methods: We analyzed de-identified data from the ABCD study (a large longitudinal multi-site study), focusing on data from the initial study visit. Data was accessed through the NIMH Data Archive after completion of a Data Use Certification agreement. Our analysis included data from 176 children (age: 9-11 years; mean(SD): 10.0(0.63); female: 15.3%) who met the following criteria at the initial study visit: (1) parent-reported diagnosis of autism spectrum disorder; (2) available diffusion tensor imaging data, and (3) available Child Behavior Checklist (CBCL) data. Our variables of interest included: fractional anisotropy (FA) of white matter tracts derived through probabilistic tractography (full-shell AtlasTrack data; 41 white matter tracts as well as FA average across all white matter tracts) and CBCL Anxious/Depressed and CBCL Depressed/Withdrawn t-scores. After assessing the distributions of the variables of interest using Shapiro-Wilk tests of normality, we conducted Spearman correlations between FA of each white matter region and each of the two CBCL subscale t-scores, and then applied FDR correction for multiple comparisons.

Results: We found negative correlations between CBCL Depressed/Withdrawn t-scores and FA in the following white matter tracts/regions: limbic white matter tracts: right uncinate ($\rho=-0.229$, $pFDR<0.05$), right fornix ($\rho=-0.212$, $pFDR<0.05$), left and right parahippocampal cingulum ($\rho=-0.204$, $pFDR<0.05$ and $\rho=-0.236$, $pFDR<0.05$, respectively); white matter tracts to/from frontal cortical regions: right inferior fronto-occipital fasciculus ($\rho=-0.240$, $pFDR<0.05$), left superior corticostriate-frontal cortex ($\rho=-0.181$, $pFDR<0.05$), left and right corticospinal/pyramidal tract ($\rho=-0.270$, $p<0.01$ and $\rho=-0.265$, $p<0.01$, respectively), forceps minor ($\rho=-0.198$, $pFDR<0.05$); the corpus callosum ($\rho=-0.181$, $pFDR<0.05$); left and right inferior longitudinal fasciculus ($\rho=-0.206$, $pFDR<0.05$ and $\rho=-0.183$, $pFDR<0.05$, respectively), and broader regions: right hemisphere DTI atlas tract fibers ($\rho=-0.185$, $pFDR<0.05$), right hemisphere DTI atlas tract fibers without corpus callosum ($\rho=-0.204$, $pFDR<0.05$) as well as the average FA across all DTI atlas tract fibers ($\rho=-0.179$, $pFDR<0.05$). The correlations between FA and CBCL Anxious/Depressed t-score did not reach statistical significance.

Conclusions: In summary, we found that aberrant white matter microstructural organization in limbic-cortical-striatal circuits, the corpus callosum and on average- across all white matter tracts in the atlas was associated with depressive symptoms in autistic children. Future analyses could focus on the longitudinal aspect of the ABCD study data as related to depressive symptoms and disorders in autistic youth. Better characterization of the neural mechanisms underlying mood problems and disorders in autistic individuals is a vital step in the development of targeted treatments.

217.004 Using Heart Rate and Behaviors to Predict Effective Intervention Strategies for Children on the Autism Spectrum: Validation of a Technology-Based Intervention

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Background: Many children on the autism spectrum engage in challenging behaviors, like aggression, due to difficulties communicating and regulating their stress. Identifying effective intervention strategies is often subjective and time-consuming. Utilizing unobservable internal physiological data to predict strategy effectiveness may help simplify this process for teachers, therapists and parents.

Objectives: This study examined whether physiological data (heart rate) could be a predictor of intervention strategy effectiveness for strategies addressing challenging behaviors in elementary school-aged students on the autism spectrum. We also explored heart rate reduction by intervention strategy type (proactive vs. reactive based on the onset of the challenging behavior).

Methods: In this proof-of-concept study, five educational teams were recruited in this study (five students and their parents, teachers and therapists). Teachers and coders from the research team recorded behavioral and heart rate data over three months for each participating student on the autism spectrum using the KeepCalm app, a platform that provides in-the-moment strategy suggestions based on heart rate and past behavioral data. A total of 226 instances of strategy interventions were recorded. A binary logistic regression was performed to assess whether heart rate reduction, time to return to heart rate baseline, and documented skills and challenging behaviors predicted strategy effectiveness. To explore the impact of strategy type, we ran *t*-tests on heart rate reduction by strategy type.

Results: The main logistic regression model was statistically significant, $\chi^2(4)=27.11$, $p<.0005$ and explained 23% (Nagelkerke R²) of the variance in strategy effectiveness (see Table 1). Heart rate reduction ($p<.05$), subsequent behaviors ($p<.01$), and subsequent skills ($p<.01$) were all found to be statistically significant in explaining strategy effectiveness, but minutes to return to green heart rate zone was not. According to these results, a 1% increase in heart rate reduction increases the likelihood of intervention strategy effectiveness by 6%.

Overall, 82% of observations recorded included a proactive strategy ($n=211$), while 18% included a reactive strategy ($n=45$) (reactive strategy included both). Proactive vs. reactive strategies were rated effective 84% vs. 56% of the time, respectively. An independent samples *t*-test indicated that proactive strategies ($M=18\%$, $SD=11\%$) had significantly higher heart rate reduction than reactive strategies ($M=14\%$, $SD=10\%$), $t(228)=2.14$, $p=.03$. We then looked at the magnitude of heart rate reduction by each intervention strategy under strategy type to see which strategies were driving these trends (see Figure 1). Self-management, prompting time delay and emotion regulation training (used proactively) were the most effective strategies, each leading to >25% reduction in heart rate.

Conclusions: Findings suggest that when educators perceive their intervention strategies as effective, there is corresponding physiological regulation in children, as evidenced by a reduction in heart rate. They also support the existing practice of using behavioral patterns as proxies for strategy effectiveness. Additional analyses indicated proactive strategies are more effective and are associated with greater reduction in heart rate (particularly strategies supporting autonomy and self-regulation), relative to reactive strategies. Further exploration of how internal physiological data can complement observable behaviors in assessing intervention strategy effectiveness is warranted given the novelty of our findings.



Panel Session

218 - Supporting Autistic Students in Schools: Development and Implementation of Evidence-Based Practices to Improve Teacher Attrition, Knowledge, and Student Outcomes

May 2nd, 2025, 2:00 PM - 4:00 PM - 606-607

Panel Chair: Kelly Beck, *Department of Psychiatry, University of Pittsburgh School of Medicine, Pittsburgh, PA*

Discussant: David Mandell, *Penn Center for Mental Health, University of Pennsylvania School of Medicine, Philadelphia, PA*

Autistic children experience many learning barriers, bullying from peers, and have worse mental health and educational outcomes than their non-autistic peers. Most educators are not well trained in how to support autistic children's learning and behavioral needs, and teacher attrition is alarmingly high, which creates challenges in maintaining an effective school workforce. This panel presents four community-engaged studies that draw attention to different aspects of the school experience for autistic students and those who work with them. Our presentations cover factors associated with teacher attrition, implementation supports to increase the reach of an evidence-based executive functioning intervention, a randomized controlled trial of an evidence-based program to reduce challenging behaviors in the classroom, and the development of a school-wide inclusivity program that trains educators how to reduce learning barriers for neurodivergent students. These projects attempt to understand and address complex school systems by measuring outcomes for autistic students and a broad range of school personnel, including special education and general education teachers, paraprofessionals, and administrators. Our findings emphasize the importance of implementation science in school research for retaining and training educators, and we detail three promising evidence-based programs with potential to improve the school workforce and learning experience for autistic children.

Introduction

K. B. Beck, *University of Pittsburgh*

218.001 School Characteristics and EBP Fidelity Predict Attrition Among Autism Support Teachers in Urban Economically Disadvantaged Schools

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Background: Schools across the United States are experiencing many vacancies and high attrition rates for special education teachers. Studies demonstrate attrition rates are higher for special education teachers than general education teachers. Among general education teachers, lack of professional development, poor administrative support, and limited school and district resources contribute to attrition. These issues have not been examined among autism support (AS) teachers, who comprise a critical component of the special education workforce.

Objectives: To estimate AS teachers' attrition rate, defined as the rate at which AS teachers leave the AS teacher position; and examine teacher (e.g., years teaching, grades), school (e.g., student-teacher ratio, school climate), and implementation (i.e., fidelity to evidenced-based practices; EBP) characteristics associated with retention.

Methods: We leveraged data from our 15-year community academic partnership between the University of Pennsylvania and the School District of Philadelphia to examine attrition among autism support teachers, and teacher and school characteristics associated with teacher retention from school years 2011-12 to 2022-23. We calculated attrition rates, probability of retention at 5 years, and median years of retention. We used a Kaplan-Meier plot to graph retention. We used Cox regression to examine teacher and school factors associated with attrition. We measured hazard ratios (HR) associated with different characteristics & added a cluster parameter for cohort year.

Results: Our sample included 571 kindergarten-through-fifth-grade AS teachers. The average rate of attrition per year was 20.3%, which ranged from 9.7% in 2020-21 to 26.1% in 2016-17. The retention probability at 5 years was 35%, 95% CI [31%, 40%]. Median retention time was 3 years, 95% CI [3, 4]. Figure 1 displays the Kaplan Meier plot. In the first model, the HR decreased with increased percentage of students with 95% yearly attendance ($p = 0.047$). The HR increased with increased student-teacher ratio ($p = 0.028$). In the second model, the HR decreased with improved EBP fidelity ($p < 0.001$). HR decreased with increased percentage of students with 95% yearly attendance ($p = 0.007$). Cohort differences were large and statistically significant (Chi-square = 39.3, $df = 8$, $p < 0.001$). Table 1 displays results from Cox regression models. AS teachers stayed more during pandemic. Data analysis is ongoing and will be updated to include school and leadership climate and teachers' salary.

Conclusions: The high rate of attrition is concerning, as it likely negatively impacts both students and schools, and is costly for the district. Reducing the student-teacher ratio and enhancing support for teachers to improve their implementation of evidence-based practices may offer effective strategies to mitigate attrition. Previous research has shown that greater EBP fidelity is linked to lower end-of-year emotional exhaustion. Our ongoing analysis will examine additional mechanisms of action and points of intervention to improve teacher retention in districts like Philadelphia. Through our academic-community partnership, we can translate these findings into policies and actions that address teacher attrition.



218.002 A Pilot Randomized Trial of Rubi in Educational Settings (RUBIES) with Paraeducators Supporting Autistic Students with Co-Occurring Challenging Behaviors

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Background: Approximately 50% of autistic youth experience behaviors such as meltdowns, aggression, and transition difficulties. The Research Unit on Behavioral Interventions (RUBI) Network developed a low-intensity, manualized parenting intervention designed to support families of autistic children in successfully navigating their child's behaviors. With 20+ research studies, RUBI is acceptable to parents and effective in reducing quality of life impacting behaviors. Schools are the most accessed service system for autistic youth, and challenging behaviors may also impact meaningful engagement in academic tasks and with peers, resulting in placement in more restrictive settings. There is limited evidence on the feasibility and effectiveness of training paraeducators to utilize behavioral techniques designed to support autistic students and improve behavioral outcomes. Using the Discover, Design, Build, and Test Framework, which combines human-centered design and implementation science, RUBI content was iteratively redesigned (and renamed RUBI in Educational Settings or RUBIES), in collaboration with elementary school partners, to tailor RUBI content to be more practical, usable, and accessible in schools.

Objectives: This pilot randomized trial examined the feasibility (session engagement, intervention fidelity) and acceptability (attrition, satisfaction) of the redesigned RUBIES intervention compared to Psychoeducation when delivered by paraeducators supporting autistic youth with challenging behaviors in elementary school. Using the Aberrant Behavior Checklist-Irritability (ABC-I) and Hyperactivity (ABC-H) subscales, exploratory analyses also were conducted to examine the effectiveness of RUBIES compared to Psychoeducation in reducing challenging behaviors.

Methods: Paraeducator-student dyads were randomized to the trainer-led 8-module RUBIES intervention or an 8-module self-guided Psychoeducation course on autism, with 16 weeks allotted to complete the assigned program. Students were stratified by grade band (K-2; 3-5) and time in inclusion (<50%; ≥50% in their least restrictive environment). Data collection occurred at Baseline, Week 16 (Endpoint), and Week 24 (follow-up).

Results: Sixty-seven paraeducators (mean age 41 years, 87% female, 70% White, 13% Hispanic) and their 65 autistic students (57% in K-2; 62% White, 15% Hispanic) from 39 elementary schools across 12 states were randomized to RUBIES (N=34) or Psychoeducation (N=33) over 3 years. RUBIES was feasible in schools (average session length was 60 minutes; implementation fidelity ranged from 58-100%) and acceptable to paraeducators (attrition=7%). Ninety-six percent of RUBIES paraeducators rated having more confidence in managing future student behaviors at week 24 compared to 54% of paraeducators in Psychoeducation. Generalized linear mixed models showed no treatment effect for irritability (ABC-I; both groups improved) or hyperactivity/noncompliance (ABC-H; both groups improved).

Conclusions: While feasibility and acceptability benchmarks suggest RUBIES may be a promising intervention for paraeducators supporting autistic students with co-occurring challenging behaviors, these findings did not translate to robust differences in change scores on student-level outcome measures. The lack of findings may be better understood when considering: (1) difficulties in promoting change with one educator-student dyad, in a complex system of care; (2) measurement issues; (3) variability in baseline rates of behavior due to inclusionary criteria, (4) small sample size, (5) psychoeducation promotes a different pathway to the same endpoint, and/or (6) perhaps the intervention is ultimately not impactful enough to promote measurable behavioral change.

218.003 Extending the Reach of an Elementary School Executive Function Intervention through the Development and Evaluation of Online Implementation Supports

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Background:

Childhood executive function (EF) abilities are adversely affected by poverty and drive academic, mental and physical health outcomes. In a comparative effectiveness trial, we found that the *Unstuck and On Target* intervention improved classroom EF behaviors in elementary school students with autism or ADHD. It was effectively delivered with good fidelity by school staff in low-income community schools. Outcomes did not significantly differ by family factors (race/ethnicity, income), suggesting that *Unstuck* works for all kinds of students and may be an accessible and equitable alternative to clinic-based care. Educator trainings were provided by research staff, however, limiting the scalability of the intervention.

Objectives:

We report on a dissemination and implementation project to convert the educator training from in-person delivery to asynchronous, online delivery with continuing education credits to increase the reach, adoption, implementation, and maintenance of *Unstuck*.

Methods:

With guidance from an advisory board (educators, caregivers of children with autism or ADHD, autistic parent/self-advocate, cultural competence expert), we created an on-line asynchronous educator training. Educators (n=293; 94% female, 90% white, M age=40±11 years) from elementary schools in Colorado and Virginia were asked to complete the training and deliver the *Unstuck* intervention. We also disseminated the training worldwide through the UnstuckandOnTarget.com website, conference presentations, listservs and media outreach.

Results:

Evaluation of the Reach, Effectiveness, Adoption, Implementation and Maintenance (RE-AIM outcomes) of *Unstuck* supported by the new online training indicated an exponential increase in its reach, with at least 5,024 students exposed to *Unstuck*, 33 times the number of students reached in the original effectiveness trial. Reach was extended beyond this implementation trial, as over 3,000 educators from across the US have now accessed the free online training and some are presumably delivering *Unstuck* to students as a result. Educators rated the training as effective with high scores for acceptability, feasibility and appropriateness. Parents (n=36) of a subsample of students who received *Unstuck* reported improvements in their child's EF. Of those educators who completed end point surveys (n=165), 73% reported delivering *Unstuck* lessons that school year, and 96% planned to run a group the following year. The training was an effective implementation support, as indicated by significantly improved educator knowledge of *Unstuck* ($t(170) = -6.26, p < 0.001$), and educator delivery of *Unstuck* with good fidelity (M fidelity = 4.7; 1-5 point scale; n=46). An implementation challenge for the *Unstuck* intervention was identified, in that only 9.3% educators reported completing all 21 *Unstuck* lessons, and 36% completed 10 or more lessons during the school year.

Conclusions:

Unstuck & On Target is evidence-supported and can be implemented with fidelity by educators who receive online, asynchronous training, distributed through a website with substantial national and international traffic. Wide dissemination of this implementation tool enhances the scalability of *Unstuck*, so that it can reach children in their community schools across the nation. Implementation challenges for the school-based delivery of *Unstuck* persist, however, including difficulty completing all 21 *Unstuck* lessons in a school year. Modularization of the curriculum may be an important next step.

218.004 The Schools Unified in Neurodiversity (SUN) Collaborative: Co-Designing and Testing a Program to Foster Inclusive Schools for Neurodivergent Children

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Background: Neurodivergent children face social, sensory, and environmental challenges at school that negatively impact learning and wellbeing. Many neurodivergent youth are bullied,^{11,12} feel less connected to school personnel, and report less membership with their school compared to their neurotypical peers.¹³⁻¹⁵ Aside from special education teachers, most educators are not trained in neurodevelopmental disabilities, leaving them with outdated knowledge and limited confidence about how to support neurodivergent children.^{15,23} Ultimately, this leaves educators unprepared and without necessary skills to create an affirming school climate for neurodivergent children. The Schools Unified in Neurodiversity (SUN) Collaborative project aimed to address these challenges by providing educators with the knowledge and tools to create a safe and inclusive school environment for neurodivergent children.

Objectives: This research project was ranked as a top priority by our established group of autistic community partners, who proposed that addressing challenges at school will improve lifetime experiences of poor mental health and suicidality. In a two-phase project, we sought to (1) co-design the SUN Program for school educators and (2) pilot test this program in one public school district.

Methods: First, we used community-based participatory research (CBPR) methods to form an interdisciplinary team of neurodivergent educators and community members. The team is comprised of general and special education teachers, school counselors, building- and district-level administrators, neurodivergent people, and parents of neurodivergent children across 6 public school districts. We then used human centered design (HCD) methods to iteratively design the SUN program (Figure 1). In Phase 2, one public school district implemented the SUN program with 192 educators, grades K-12 (Table 1). Attendees completed a SUN knowledge survey ($\alpha=.965$), the AASPIRE Autism Healthcare Provider Self-efficacy Scale adapted for educators ($\alpha=.958$), and three established implementation scales: Acceptability of Intervention Measure (AIM), Intervention Appropriateness Measure (IAM), Feasibility of Intervention Measure (FIM). We hypothesized that educator's knowledge and self-efficacy would increase and that the SUN Program would have strong feasibility, acceptability, and appropriateness for implementation.

Results: The resulting SUN Program is a 6-hour program with 4 content modules: (1) neuroscience of neurodiversity, (2) supporting safe relationships, (3) creating inclusive environments, and (4) preventing and responding to emotional distress. The SUN Program is designed to be implemented across an entire school with all school personnel (e.g. general and special education teachers, paraprofessionals, principals, district administrators). Both educator knowledge ($t(191) = -27.7, p < 0.001; d = 9.54$) and self-efficacy ($t(191) = -20.7, p < 0.001; d = 7.02$) significantly improved with large effect sizes. Educators found the SUN tools to be acceptable ($M = 4.2; SD = .71$; 86% agreed or strongly agreed), appropriate ($M = 4.35; SD = .63$; 92% agreed or strongly agreed) and feasible ($M = 4.29; SD = .59$; 93% agreed or strongly agreed) to implement in their classrooms and school.

Conclusions: Together, CBPR and HCD provided an innovative and community-driven approach to intervention development, resulting in a program that was well-received, effective, and conducive to implementation. Future work will test the effects of the SUN program on child outcomes and explore the role of professional learning communities to support implementation and sustain change.



Oral Session -

315 - Pathways to Mental Health: Exploring Interventions, School Environments, and Emotional Burden for Autistic and other Neurodivergent Youth

May 2nd, 2025, 4:30 PM - 5:30 PM - 6B

Moderator: Steven Kapp, School of Psychology, Sport and Health Sciences, University of Portsmouth, Portsmouth, Hampshire, United Kingdom

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315.001 The Association between Mental Health Hospitalizations and Applied Behavior Analysis Receipt Among Autistic Youth
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Background: Applied Behavioral Analysis (ABA) is a widely used intervention for autistic children. While intended to improve autistic children's social functioning and reduce problem behaviors, in recent years, autistic self-advocates have critiqued the use of ABA as contributing to adverse mental health outcomes in adulthood. There has, however, been limited quantitative research on the association between childhood ABA receipt and mental health outcomes.

Objectives: This study aimed to investigate the association between ABA receipt and mental health outcomes.

Methods: We used de-identified, individual-level healthcare records from the 2012-2020 IBM MarketScan Commercial Claims and Encounters Database. Autistic youth who had at least one outpatient ABA encounter (N=18103) were propensity score matched to autistic youth (N=18103) who never received ABA on the basis of sex, age, US region of residence, super-rurality, amount of follow-up time, intellectual disability, mood disorder, anxiety disorder, and psychotic disorder. We used ICD-9 and ICD-10 diagnostic codes to identify mental health diagnoses and hospitalizations. Demographic variables included sex, age, US region of residence, and super-rurality. We calculated descriptive statistics and used negative binomial regression with a log link and log(person years) offset to assess average rates of mental health inpatient hospitalization and length of hospital stay. We then used logistic regression with log(person years) offset to assess odds of suicidality and PTSD diagnoses for ABA compared to non-ABA groups.

Results: Both the ABA and non-ABA groups were 79.6% male and relatively evenly distributed across the US. Clinically, 5% had intellectual disability, 10.3% had a mood disorder, 25.2% had an anxiety disorder, and 3.6% had a psychotic disorder. Adjusting for sex, region, super-rurality, baseline age, intellectual disability, anxiety disorders, mood disorders, and psychotic disorders, those in the ABA group were 1.39 (95% CI: 1.19-1.63) times more likely to experience a mental health hospitalization ($p<0.001$). Those in the ABA group had 46% (95% CI: 1.25-1.71, $p<0.001$) higher rates of mental health hospitalizations and 32% (95% CI: 1.07-1.64, $p<0.05$) longer lengths of stay across inpatient stays compared with the non-ABA group. There were no differences detected between the ABA and non-ABA groups on the likelihood of PTSD diagnoses or suicidality.

Conclusions: This study found significantly higher odds of experiencing a mental health hospitalization and a significantly longer length of stay for mental health hospitalizations among autistic youth who received ABA. Of note, our sample of autistic youth were matched on demographic factors including mood, anxiety, and psychotic disorders, suggesting similar baseline levels of mental health needs. Findings warrant future examination of the potential unintended consequences of ABA. Future research should seek to leverage longitudinal data that tracks mental health outcomes in autistic youth over a longer follow-up period to better understand the association between ABA dosage and mental health outcomes, particularly in young and middle adulthood.

315.003 “My Emotions in School Inventory” (MESI): Emotional Burden Experienced By Mainstream Secondary Students with Neurodivergence As Measured By a Novel Self-Report Measure

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Background: Emotion dysregulation (ED) has been shown to mediate the risk for developing mental health problems in neurodivergent youths with ADHD and/or autism. However, mainstream literature almost exclusively defines emotion dysregulation as deficits of emotion processing and control (DEPAC) within the person. The RE-STAR (Regulating Emotions Strengthening Adolescent Resilience) research programme puts forward an alternative mediator between neurodivergence and mental health, i.e., emotional burden (EB), extrinsically driven by frequency and intensity commonly upsetting events (CUEs), for example, at school.

Objectives: Using the “My Emotions in School Inventory” (MESI), a novel self-report measure of emotional burden, co-produced with neurodivergent RE-STAR youth researchers, we investigated in a cross-sectional design:

- The construct of the EB index, a measure of emotional burden produced by the MESI.
- The frequency and intensity of CUEs at school, and the EB experienced by neurodivergent secondary school students (with autism and/or ADHD) compared to their neurotypical peers.
- The association between EB and DEPAC and mental health problems among students.
- Whether burden was influenced by distinct sets of CUEs for autistic students compared to those with ADHD.

Methods: The MESI consists of 25 school-based CUE and assesses: (a) how frequently the CUE occurs, and (b) how upsetting it is. The EB index was created from a latent construct indicated by the multiplication of the CUE frequency and intensity. We conducted exploratory factor analysis (EFA) to construct a psychometrically robust EB-index. We also conducted group comparisons, linear discriminant analyses (LDA), and multiple regression, using data collected from 735 young people (ADHD, n=100; autism, n=104; ADHD+autism, n=79; and neurotypical [NT], n=452).

Results: EFA showed that the EB-index, based on 24 or 25 MESI items, was a robust psychometric construct. The neurodivergent groups (i.e., autism and/or ADHD) experienced higher frequency and intensity of CUE and demonstrated higher EB than their neurotypical peers. EB strongly predicted depression/anxiety, and both EB and DEPAC independently predicted depression/anxiety, controlling for ADHD and autistic traits. LDA showed distinctive CUE items which contributed to a strong burden in ADHD compared with in autism.

Conclusions: Our initial cross-sectional findings illustrate the potential value of the *EB index*, as measured by the MESI, as a contributory factor in mental health risk in neurodivergent adolescents alongside DEPAC. This is being further investigated through a longitudinal study. The findings also identify both EB and DEPAC as potential targets for school-based interventions which aim to support the mental health of neurodivergent young people.

315.004 Supporting Autistic Children Who Have Experienced Interpersonal Trauma - a Delphi Study

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Background: Autistic children are more vulnerable to experiencing and being impacted by interpersonal trauma. Despite this enhanced risk, research proposing therapeutic support recommendations is outdated, limited and methodologically inconsistent. It is currently unclear how clinicians are supporting these children. Without evidence to guide practice, support is inconsistent at best, while at worst, it is inadequate and potentially exacerbating mental ill health. In the absence of evidence, it is valuable to look to clinical expertise as a complementary source of knowledge that can offer guidance.

Objectives: This study aimed to establish expert consensus for what constitutes optimal therapeutic support for autistic children who have experienced interpersonal trauma, with the intention of facilitating the development of preliminary best practice guidelines. Specifically, we sought to identify therapeutic recommendations and modalities clinicians consider 'helpful' or 'unhelpful' when supporting these children.

Methods: We recruited 29 experts in autism and interpersonal trauma in childhood. Via a 2-round Delphi survey, experts commented on and rated the helpfulness of recommendations drawn from a recently published scoping review. A revised list of recommendations including new recommendations suggested by experts in the first round was submitted to a second round (n = 20; 69% retention) of expert review and rating. Data was analysed thematically and consensus was achieved when agreement was greater than or equal to 80%. Two researchers independently analysed the data via thematic analysis, compared their findings and revised discrepancies to enhance the credibility of the findings.

Results: Eighty-seven (60.0%) recommendations achieved a 'helpful' consensus, and three (2.1%) reached an 'unhelpful' consensus. Generally, participants endorsed therapeutic recommendations that align with guidelines for supporting similar populations of children, such as neurotypical children who have experienced interpersonal trauma. Three key themes emerged: prioritising child and family safety, involving parents/caregivers in therapy and individualising supports to the child's characteristics. The effectiveness of therapeutic recommendations was considered dependent on child and family safety and whether therapy was individualised according to the child's traits. Where possible, participants encouraged parent/caregiver involvement in therapy.

Conclusions: These findings provide valuable insights into current clinical practice and may be used to facilitate the development of preliminary best practice guidelines to direct therapeutic support in the absence of empirical evidence. This study also identified therapeutic recommendations for this population that should be validated in future research.

Oral Session -

316 - Promising Novel Analytics, Big Data and Multimodal Approaches to Understand Brain Function and Biology in Autism

May 2nd, 2025, 4:30 PM - 5:30 PM - 6C

Moderator: Adriana Di Martino, Child Mind Institute, New York, NY

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316.001 Testing the E/I Imbalance Theory of Autism By Combining Genetic Scores, Concentrations of Glutamate and GABA, and Behavioral Characteristics of Autism

V. Hollestein¹, A. R. Thomson², E. Loth³, D. Murphy⁴, J. K. Buitelaar⁵ and N. A. Puts³, (1)Cognitive Neuroscience, Donders Institute for Brain, Cognition and Behavior, Nijmegen, Netherlands, (2)Forensic and Neurodevelopmental Sciences, Institute of Psychiatry, Psychology & Neuroscience, King's College London, London, United Kingdom, (3)Department of Forensic and Neurodevelopmental Sciences, Flat 2, 116, South Hill Park, London, London, United Kingdom, (4)Department of Forensic and Neurodevelopmental Sciences, Institute of Psychiatry, Psychology and Neuroscience, King's College London, London, UNITED KINGDOM, (5)Department of Cognitive Neuroscience, Donders Institute for Brain, Cognition and Behaviour, Radboud University Nijmegen Medical Center, Nijmegen, NETHERLANDS

Background:

The excitatory/inhibitory (E/I) imbalance theory suggests that an imbalance between excitatory and inhibitory mechanisms in the brain underlies autism traits. However, we do not know how this E/I imbalance manifests and whether it differentially affects autism traits. To date, studies have mainly focused on either excitation or inhibition in isolation, and in a unimodal fashion, failing to take their potential interactions into account and leading to inconsistent results.

Objectives:

To bridge this gap, genetic measures were combined with the in vivo 1H-MRS measures of *both* glutamate (excitation) and GABA (inhibition), and their ratios, in the anterior cingulate cortex (ACC) and thalamus. We explored how these genetic and neurochemical markers may be interconnected, and how their potential interactions could influence behavioral characteristics associated with autism.

Methods:

Participants were part of the third wave of the AIMS-2-TRIALS Longitudinal European Autism Project (LEAP) cohort (166 participants (autistic = 103, male/female = 79/24; neurotypical = 63, male/female = 42/21) aged between 13-36 years. Behavioral characteristics of autism were measured using interviews and questionnaires; social communicative behaviors (Social Responsiveness Scale-Revised (SRS-2), repetitive behaviors (Repetitive Behavior Scale-Revised (RBS-R), and sensory processing (Short Sensory Profile (SSP). For the autistic participants scores on the Autism Diagnostic Observation Schedule (ADOS-2) were also available.

Associations between aggregated genetic variations of the glutamate and GABA gene-sets and glutamate and GABA concentrations were estimated using MAGMA (multi-marker Analysis of GenoMic Annotation). MAGMA tests whether the aggregated association of the genes in the gene-set with the phenotype (1H-MRS measured glutamate or GABA) is stronger than all other genes in the genome.

Linear models were used to assess interactions between glutamate and GABA genes with glutamate and GABA concentrations on behavioral autism characteristics. Gene-set autism polygenic scores (PGS), glutamate and GABA concentrations and their ratios in each region (ACC, thalamus) were the predictors, with behavioral measures as outcome measures. Each combination of polygenic score x MRS measure resulted in 48 models.

Results:

Genetic variation of glutamate genes were associated with GABA concentrations in thalamus, and GABA genes with glutamate concentrations in thalamus (Table 1). Interactions were observed between ACC glutamate and glutamate PGS on social-communicative, sensory behaviors, and core clinical autism traits captured by ADOS-2. Glutamate/GABA ratios in the thalamus with gene-set PGS also had interaction effects on social-communicative behaviors and ADOS-2 scores.

Conclusions:

These findings demonstrate that a complex interaction between markers of glutamate and GABA play a critical role in shaping autism characteristics, with these associations being influenced by both genetic factors and metabolic processes. This underscores the importance of measuring glutamate and GABA concentrations together, and using multimodal markers of their functioning to more effectively unravel how excitation/inhibition (E/I) imbalances may contribute to autism in diverse ways. Particularly the interaction effects observed in the thalamus, a region crucial for sensory processing consolidation, show that sensory processing alterations in autism may have differing underlying factors than other core clinical characteristics.



316.002 Assessing the Impact of Open Data Sharing in Autism Neuroimaging Research of the Brain Connectome

P. Thomson¹, D. Perez¹, S. Park², T. George¹, M. P. Milham³ and A. Di Martino¹, (1)Child Mind Institute, New York, NY, (2)Autism Center, Child Mind Institute, New York, NY, (3)Nathan S. Kline Institute for Psychiatric Research, Orangeburg, NY

Background: The Autism Brain Imaging Data Exchange (ABIDE) provided the first open neuroimaging autism-related data resource aggregating over ~2100 MRI and related phenotypic information across 24 international research laboratories, with the goal to accelerate the pace of discovery and facilitate collaborations. Over 10 years have passed since its first release, offering a critical opportunity to evaluate ABIDE's impact on the scientific community.

Objectives: We aimed to systematically assess the impact of the open ABIDE dataset in autism neuroimaging research, specifically regarding its use and scope of research questions addressed.

Methods: A systematic literature review consistent with PRISMA guidelines identified peer-reviewed articles published between January 2013–June 2023. We then categorized articles into those using ABIDE MRI data and those not. Article data extracted from included articles were across three domains: 1) analysis/approach, 2) publication information, 3) sample characteristics. Summary statistics within, and statistical comparisons between, ABIDE and non-ABIDE articles were conducted. During review, a complementary criteria set was developed to assess transparency of reporting in seven domains: research objectives/hypotheses, datasets, analysis variables, imaging preparation, analytical approach, participant description, imaging results. Criteria were applied to ABIDE resting-state functional MRI (R-fMRI) articles yielding a reporting transparency score from 0–10.

Results: We identified 718 peer-reviewed empirical neuroimaging articles published using ABIDE and 654 using non-ABIDE data (Fig.1). Most ABIDE articles considered R-fMRI data (75%), while non-ABIDE articles predominantly analyzed structural MRI (sMRI; 50%) (Fig.2A-B). Across ABIDE and non-ABIDE articles, group mean comparisons was the most common research purpose. There was, however, a wider range of research purposes in ABIDE than non-ABIDE articles and a significantly greater number of studies focusing on novel analytical approaches (Fig.2C). For example, significantly more ABIDE studies focused on diagnostic classification, neurosubtyping and development of new methods. There were no significant differences in journal impact factor ($p=.056$; Fig.2D). ABIDE articles examined significantly larger sample sizes than non-ABIDE ($p<.001$; Fig.2E) and older mean sample ages ($p=.002$; Fig.2F), though both focused predominantly on childhood and adolescence. The average reporting transparency score for ABIDE R-fMRI articles was 6.5; transparency was higher for basic sample characteristics and analytical design, but lower for participant selection rationale, detailed sample characteristics and MRI data quality reports.

Conclusions: Over 1300 autism studies in R-fMRI, sMRI and diffusion MRI modalities have been published in the last 10 years. ABIDE has facilitated an explosion of this research, providing greater statistical power for group mean comparisons, and facilitating approaches exploring heterogeneity (e.g., neurosubtyping) and inter-individual differences (e.g., classification). Along with clear benefits of open data resources, results from this review emphasize several needs. For example, the strong focus on child-adolescent collections highlights the need for including a wider age range in large cohorts. Adopting clear reporting standards will also clarify the representativeness of neuroimaging findings, bolstering robustness and replicability. Findings motivate and inform future open data efforts for autism and beyond.



316.003 Structural Determinants of Signal Speed: An Intermodal Investigation of Face Processing in Autism Spectrum Disorder

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Background:

The N170 is an event related potential (ERP) elicited in response to faces over posterior scalp electrodes. Previous studies demonstrated slower responses to faces in Autistic (Autism Spectrum Disorder, ASD) participants as compared to typically developing (TD) participants. Observed differences in latency may be due to variations in axonal morphology, which has been challenging to measure. However, a new MRI metric, aggregate conduction velocity (ACV), incorporates measurements of myelin and axonal diameter to estimate action potential speed. By relating axonal structure to function, we can investigate microstructural differences underlying heterogeneous behavioral phenotypes observed in ASD.

Objectives:

To elucidate the microstructural correlates of face processing across cohorts, this study tested the interaction between ACV and tract length with latency of the N170. We examined white matter pathways connecting the primary visual cortex (V1) and right fusiform cortex (rFFA) across cohorts. We hypothesized observing slower N170 latency to faces in ASD, and that this delay would be negatively associated with V1 to rFFA ACV.

Methods:

ASD ($n = 66$) and TD participants ($n = 66$) viewed faces and objects in a social reward task while undergoing electroencephalography (EEG) and later underwent diffusion MRI. An AIC stepwise regression analysis identified the best predictors of N170 latency based on phenotypic and imaging metrics along V1 to rFFA pathways, including ACV, tract length, age, sex, Social Communication Questionnaire (SCQ) score, pubescence, and IQ.

Results:

TD participants demonstrated significantly faster responses to both objects and faces ($p < 0.001$). ACV along the V1 to rFFA pathway did not differ as a result of diagnosis ($p = 0.188$), although ACV was higher across all pathways in TD participants relative to those with ASD ($p < 0.003$). While TD participants had faster responses to faces than ASD participants, this was not statistically significant ($p = 0.51$). The best fit model as determined by AIC was significant and explained 29.88% of the variance in N170 latency ($p < .001$). It showed that N170 latency in the right hemisphere was negatively associated with ACV ($p = 0.043$) and positively associated with tract length ($p = 0.007$). Also included in the final model was age ($p = .091$), SCQ score ($p = .186$), the interaction between ACV and SCQ score ($p = .128$), and the interaction between tract length and age ($p = .023$). This relationship was driven by participants below the median SCQ score, or those with less severe autistic traits.

Conclusions:

We demonstrated that ACV and tract length along the V1 to rFFA pathway are both significantly associated with N170 latency in response to faces. This study is the first time a biological explanation of N170 latency has been tested. We demonstrate the efficacy of ACV as a non-invasive, in-vivo metric of information transfer speed, sensitive to autism trait severity. Our method allows assessments of function in regions unable to be evaluated by EEG due to gyrification. Importantly, our results present a novel and robust bimodal methodology which successfully integrates structural markers to assess functional differences in neurodevelopmental disorders.



316.004 Functional Temporal Dynamics and Spatial Heterogeneity of the Fusiform Gyrus in Autism

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Background:

Autism is primarily characterized by social difficulties. Differences in the way autistic individuals process faces have been examined at the neural level in core regions of the face processing network, such as the fusiform gyrus (FFG)^{1,2}. While functional magnetic resonance imaging (fMRI) studies report different patterns of activation and connectivity within the FFG in autism^{1,4}, prior research mainly addressed static functional properties across the whole FFG. How activity within the FFG and its functional subdivisions dynamically reconfigures with the rest of the brain in autistic compared to non-autistic individuals (NAI) remains unclear. Furthermore, typical sex differences in face processing exist with females outperforming males on emotional face recognition tasks⁵ and having a reduced right hemisphere dominance compared to males⁶. Also, in autism, sex differences have been implicated in regions and networks related to face processing^{7,8}. Whether these sex difference in autism also extend to dynamic functional connectivity (dFC) of the FFG with the rest of the brain remains to be established.

Objectives:

Using a recent extension of a dFC approach (micro-co-activation patterns [μ CAPs] analysis^{9,10}), we aimed to characterize both spatially and temporally the functional reconfigurations of the FFG with the rest of the brain in autistic compared to non-autistic males and females.

Methods:

We included 286 autistic individuals (208 males) and 228 NAI (146 males), aged 6–30 years from the large-scale EU-AIMS Longitudinal European Autism Project. We used resting-state fMRI data to derive data-driven, k-means-clustering based μ CAPs using the left and right FFG as one seed region. Unlike conventional methods, μ CAPs extract dynamic spatial patterns that reveal functional subdivisions of the seed region (i.e., FFG). Functional networks were characterized by overlapping them with the 17 Yeo networks. To assess the spatial overlap between the μ CAP subdivisions within the FFG between autistic and NAI, we computed Dice coefficients and evaluated statistical significance with 10,000 permutations. We further compared the occurrences of the different μ CAPs using linear mixed-effects models with diagnosis, sex, diagnosis-by-sex interaction, mean framewise displacement and age as fixed effects and acquisition site as random effect.

Results:

We derived six μ CAPs co-activating with the ventral attention/somatomotor, dorsal attention, visual central, visual peripheral, limbic, and default network (DN). All six μ CAPs showed large spatial overlap between autistic and NAI ($p > 0.05$). There was a significant sex-by-diagnosis interaction ($t = 2.61$, $p = 0.009$, $pFDR = 0.05$) with NAI females exhibiting fewer occurrences of the DN μ CAP than NAI males ($t = 3.79$, $p = 0.001$), whereas autistic individuals did not show such sex difference ($t = 0.17$, $p = 0.99$).

Conclusions:

Using a novel dFC approach, we examined the spatial and temporal reconfigurations of the FFG in autism. Our findings revealed that autistic individuals do not differ from NAI in the spatial extent of FFG subdivisions co-activating with various brain networks. However, autistic males and females did not show sex differences in co-activation patterns between the FFG and DN as observed in NAI. These findings suggest that the typical sex differences in the dFC of face processing networks are attenuated in autism, highlighting the importance of considering sex-related variability when examining brain dynamics in autism.

Oral Session -**317 - Addressing Self Injurious & Dangerous Behaviors in Individuals with Profound Autism**

May 2nd, 2025, 4:30 PM - 5:30 PM - 6A

Moderator: Alison Singer, *Autism Science Foundation, New York, NY*

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317.001 ECT in Profound Autism and Incredibly Dangerous Self-Injurious Behavior

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Background: Individuals with profound autism have a high risk of psychiatric comorbidities given that both autism spectrum disorders and intellectual disability independently increase the risk of additional psychiatric diagnoses which may be exquisitely responsive to electroconvulsive therapy (ECT).

Objectives: This presentation aims to review severe psychiatric and associated behavioral comorbidities of profound autism that may be safely, rapidly and efficaciously treated with ECT, often after lack of response to pharmacological interventions and accrual of significant clinical morbidity

Methods: A comprehensive literature review surrounding electroconvulsive therapy in autism and intellectual disability combined with multiple illustrative case examples.

Results: Eight decades after its inception in 1938, electroconvulsive therapy remains the most powerful agent in the psychiatric armamentarium, specifically for severe affective, psychotic, catatonic and combined psychopathology that has not proven responsive to first-line psychotropic interventions and has led to significant and often life-threatening clinical morbidity and potential mortality. Autism across the spectrum is associated with increased risk of multiple psychiatric comorbidities, including ADHD, anxiety, depression, psychosis and catatonia. Intellectual disability has been recognized since the 1970 Isle of Wight studies to confer an approximately three to four-fold increased risk of all psychiatric comorbidities. Given that profound autism by definition includes IQ below 50, it is not surprising that in recent years, a growing literature documents the utility, efficacy and safety of ECT not only for individuals with profound autism struggling with major affective and psychotic illness, but most prominently in catatonia, including both its psychomotor agitated and retarded forms, life-threatening malignant catatonia and intractable, highly dangerous repetitive self-injurious behavior devoid of social function and newly recognized along the catatonia spectrum. Although ECT often remains stigmatized and implemented as a last resort, its critical role in ASD, and particularly profound ASD is expanding given vast clinical need and astounding response, at times when all hope was otherwise lost.

Conclusions: ECT plays a growing role in the treatment of severe affective, psychotic, catatonic and combined pathology that occurs at elevated rates in profound autism. Although highly stigmatized and unequally available, ECT is a critical agent in the clinician's profound autism toolbox to optimize outcomes for individuals served and their families.

317.002 Treatment Outcomes for Behavioral Concerns in Profound Autism

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Background: Externalizing behavioral concerns, such as aggression, self-injury, disruption, elopement, and pica, are prevalent among autistic individuals, and even more so in individuals with autism with high-support needs (e.g., profound autism). Behavioral treatments are empirically supported to help with these behaviors, but past research has often either focused on individuals with lower support needs (e.g., minimal or no intellectual disability) or has not provided sufficient description of the sample to determine if individuals with profound autism are included.

Objectives: The aim of the current project is to evaluate behavioral presentations and outcomes for individuals with profound autism from a) a clinical trial targeting elopement in autistic youth and b) outcomes from an intensive behavioral treatment program.

Methods: We previously conducted a randomized clinical trial of a caregiver-mediated function-based elopement treatment with 76 autistic youth (age 4 to 13). In this study, we compare outcomes from 27 youth with significant intellectual disability to the remaining sample on primary outcomes of the Clinical Global Impression Scale and caregiver-collected data on elopement frequency. Second, we evaluate 40 records from a consecutive retrospective case review (20 with profound autism and 20 without; age 6-19) from an intensive outpatient program treating behavioral concerns in autism. We compared these groups (individuals with and without profound autism) based on specific behavioral concerns targeted in treatment; behavioral assessment outcomes; treatment components included in final treatment packages; and success of intervention (defined as meeting caregiver-set goals and observed reductions in behavioral concerns). Multivariate analysis of variance (for continuous) and chi-squared analyses (for categorical) outcomes were conducted.

Results: In the randomized clinical trial, no significant differences were observed when separating the sample based on recent definitions of profound autism based on the primary outcomes ($p = .57$). In the intensive outpatient sample, self-injury was more common among individuals with profound autism and elopement was more common in those without profound autism, which aligns with previous research. No significant differences were observed in success of intervention, based on observed reductions in target behaviors ($p = .33$) or caregiver goals met ($p = .12$). However, more treatment components were in final treatment packages for individuals with profound autism ($p < .005$).

Conclusions: Retrospective analyses of data from a randomized clinical trial of a caregiver-mediated treatment for elopement suggested no differences in treatment efficacy for those with and without profound autism. In the intensive outpatient program, significant differences were not noted in overall success of intervention. However, more nuanced variables (e.g., number of treatment components included) suggest that behavior of youth with profound autism may be more resistant to change. The researchers and clinicians that designed the elopement manual and that serve as case managers in the intensive program specialize in treating behavioral concerns in youth with profound autism. Thus, results are discussed as they relate to this expertise, with an emphasis on the need for determining which factors in treatment contexts relate to positive outcomes for youth with profound autism.

317.003 A Multi-Phased Training Approach: Using Module, Video, and Simulation-Based Education to Teach Behavior Management Skills to Multidisciplinary Teams in a Pediatric Hospital Setting

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Background: In the United States, there is recognition of a “mental health crisis” among children and adolescents with behavioral health needs, particularly those with autism spectrum disorder (ASD) and high support needs. Given limited access to specialized psychiatric care, children with ASD are likely to present to acute care hospital settings. While hospitalized, children are at increased risk of aggression and self-injury, exacerbated by the novel and overstimulating hospital environment and lack of adequate staff training on meeting patients’ needs. To address this, research on approaches to educate staff is warranted, particularly multidisciplinary staff that might respond to behavioral events. To date, some preliminary research exists on medical staff educational programs, particularly programs using lecture-based formats. However, research is needed on training packages that include skills-based practice and target multidisciplinary teams.

Objectives: The purpose of this study was to 1) describe a multi-phased medical staff training program on caring for patients with ASD and behavioral health needs, and 2) evaluate learning outcomes from the program.

Methods: A team of nursing leaders and educators, board certified behavior analysts, and simulation specialists designed a 3-part training series consisting of: 1) didactic instruction (modules and training tools), 2) modeling (training video), and 3) applied skills practice (simulation). A modified version of the Behavior Activity Rating Scale (BARS) was adopted to guide design of the simulation, in which a simulated, minimally verbal patient escalated from baseline (level 1) to severe aggression (level 5) and staff responded in line with pre-determined actions corresponding to their role. Pre- and post-survey questions were administered to measure staff knowledge and confidence in responding to behavioral events, a competency checklist was used to assess for skills demonstrated during the simulation, and staff provided ratings for each educational component. All staff who completed the training were offered the option to consent for data use as part of the study.

Results: A total of 122 staff members consented to data use. Staff members included nurses, personal care assistants, sitters, house supervisors, security guards, and social workers. The Wilcoxon signed rank test was used to compare participants’ pre and post-ratings. All scores increased significantly as a result of the training, staff rated the training highly overall, and staff rated the simulation portion of the training as most helpful. See Tables 1 and 2 for details. In addition, staff demonstrated skills with 83.6% accuracy, with 96% interobserver agreement achieved between raters. Long-term outcome data is also being collected.

Conclusions: This study describes a multi-phased educational approach that was designed and implemented to increase staff knowledge, confidence, and skills in providing care to patients with ASD and behavioral health needs. Our study suggests that multi-modal learning may increase staff knowledge and confidence, particularly by allowing staff to learn about and observe skills followed by practice of skills. In addition, staff likely benefit from debriefing and repeated practice that is offered for any skill gaps. Currently, we are working on educational strategies to address any educational gaps and to target maintenance of educational gains.



317.004 Characterizing Key Correlates of Challenging Behavior Domains in Profound Autism

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Background: Challenging behaviors (CB) encompass clinically impactful, disruptive behaviors that commonly co-occur in a range of neurodevelopmental disorders (NDD), including autism spectrum disorder and neurogenetic developmental disabilities (NDG). Existing research in NDD samples broadly suggests associations between higher levels of CB and features such as lower speech level, elevated autism traits, and difficulties with regulating emotions. However, despite the prominence of these factors among individuals with NDD and severe intellectual disability (ID), their role in the emergence and maintenance of CB in this population remain poorly understood, especially when considering individuals with profound autism. Thus, more work is needed to identify potential risk markers for CB among individuals with profound autism characteristics, where these behaviors might be particularly prevalent and impactful.

Objectives: To characterize the relative contributions of developmental and clinical features in predicting the severity of CB subdomains in a sample that includes individuals with NDG, ASD, and significant ID and speech delays.

Methods: Parents/caregivers of 255 individuals with NDG (3-45 years old) participated in this study (51.0% male; 46.1% nonspeaking or single word speech). Parents/ caregiver informants completed questionnaires as part of the Neurobehavioral Evaluation Tool (NET), a set of 11 online-administered survey scales developed for people across the cognitive ability range. Hierarchical regression models were conducted to examine unique predictors of property destruction, aggression, elopement, conduct problems, and self-injury. For each model, age and speech production were entered in step 1, social communication in step 2, emotion dysregulation in step 3, physiological anxiety and worry in step 4, and sensory sensitivity in step 5.

Results: Speech production and social communication were negatively correlated with each of the CB subdomains ($r = -0.21$ - -0.54). Additionally, emotion dysregulation, physiological anxiety, and sensory sensitivity were positively associated with the five CB subdomains ($r = 0.16$ - 0.62). Worry was negatively correlated with elopement ($r = -.14$) and positively associated with aggression ($r = 0.14$). Unique profiles of predictors emerged for distinct CB. Specifically, lower speech production was associated with conduct problems ($t = -2.99, p = .003$) and elopement ($t = -2.46, p = .015$), while emotion dysregulation uniquely predicted self-injury ($t = 3.01, p = .003$), conduct problems ($t = 7.61, p < .001$), property destruction ($t = 5.894, p < .001$), aggression ($t = 6.05, p < .001$), and elopement ($t = 2.91, p = .003$). Physiological anxiety uniquely predicted aggression ($t = 2.31, p = .022$) and elopement ($t = 3.99, p < .001$).

Conclusions: These findings provide further evidence that clinical features associated with profound autism are associated with greater CB severity. These features include nonspeaking profiles, significant delays in social communication, and greater difficulties in emotion regulation due to significant ID. Emotion dysregulation emerged as a consistent, strong predictor of severity across distinct types of CB, suggesting that dysregulation is an important intervention target for CB in profound autism. Findings provide unique insights into nuanced associations between developmental and psychological correlates of CB to inform improved assessment and monitoring of CB in profound autism.

Oral Session -

318 - The Importance of Access to Public Health Care for Autistic Adults

May 2nd, 2025, 4:30 PM - 5:30 PM - 611-614

Moderator: Adam Guastella, Faculty of Medicine and Health, University of Sydney, Sydney, NSW, Australia

318.001 Perinatal Mental Health Among Autistic Individuals in an Integrated Healthcare Setting in California

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Background: Autistic pregnant individuals commonly experience known risk factors for perinatal depression, including a history of psychiatric problems and trauma before pregnancy, intimate partner abuse, pregnancy complications, and low social support. Qualitative interviews and survey studies indicate a heightened risk of depression and anxiety during pregnancy for autistic people, though research in this area remains limited.

Objectives: To compare perinatal mental health outcomes between pregnant autistic people and non-autistic peers, both of whom received obstetric care and perinatal depression and anxiety screening in the same US healthcare system.

Methods: Our study took place at Kaiser Permanente Northern California (KPNC), a large, integrated healthcare delivery system. Among KPNC members with a clinician-documented diagnosis of autism, we identified individuals with pregnancies ending between January 2011 and July 2022 and matched them 100:1 on birth year to pregnancies among non-autistic peers. For this analysis, we then further restricted the sample to pregnancies ending in live births. From electronic health records, we extracted information on sociodemographic factors; mental health diagnoses in the 2 years preceding pregnancy, during pregnancy, and 12 months postpartum; severity of depressive symptoms during pregnancy and postpartum; and psychotherapeutic medication use during pregnancy. We defined mild, moderate, and severe depressive symptoms as scores of 5-9, 10-15, and 15-27, respectively, on the PHQ-9, a validated screener for depression that has been regularly administered throughout prenatal and postpartum care at KPNC since 2011.

Results: Our sample included 91 autistic and 11012 non-autistic pregnant people. Autistic people were significantly more likely than non-autistic peers to be diagnosed with depression during the two years before pregnancy (32% vs. 10%), during pregnancy (63% vs. 17%), and during the 12 months postpartum (29% vs. 12%). Most diagnoses of depression during pregnancy were new episodes (i.e., did not have a diagnosis in the two years preceding the pregnancy), though this proportion was smaller among the autistic group than in the non-autistic group (56% vs. 64%). Depressive symptom severity during pregnancy was similar between both groups, but severe postpartum depressive symptoms were more common in the autistic group than in non-autistic group (severe: 38% vs. 29%). Anxiety during pregnancy was also more frequent in autistic people than in non-autistic people (26% vs. 11%). Rates of antidepressant use among those with a depression or anxiety diagnosis during pregnancy were similar between the autistic and non-autistic groups (25%).

Conclusions: Our findings corroborate earlier reports that autistic individuals experience a more significant perinatal mental health burden than their non-autistic counterparts. In a setting with universal perinatal depression screening, prenatal depression was recognized in over half of autistic pregnant people. Despite comparable antidepressant use between groups, autistic individuals with diagnosed depression typically exhibited more severe depressive symptoms than non-autistic people. Inadequate mental health management during and after pregnancy can have lasting impacts on both parent and child. To better inform support and intervention services for autistic pregnant people, we will augment these results with analyses of sociodemographic predictors of perinatal mental health and the use of psychotherapy services following perinatal depression diagnosis.

318.002 Beyond the Numbers: Key Drivers of Emergency Room Use Among Autistic Adults Aged 18-80

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Background: Autistic individuals are significantly more likely to experience a variety of co-occurring health conditions. The best care environment for any person, but particularly autistic individuals, is routine care with known and trusted providers. Emergency departments (EDs) are not only overwhelming, but rarely have providers with training or resources to facilitate communication or accommodations needed for positive care outcomes. While many studies have identified high rates of ED visits among autistic children, adolescents, and young adults (e.g., Benevides et al., 2020; Giannouchos et al., 2023; Kalb et al., 2022; Ianuzzi et al., 2022), we need a more nuanced understanding the reasons for those visits, with few to no studies examining the top contributing reasons for high ED utilization. Further, the clinical and research community has called for more research with autistic people having greater functional need.

Objectives: The objective of this cross-sectional study of all-payer ED data was to identify the top reasons for visits among autistic adults aged 18-80y. A secondary objective was to quantify reasons by varying levels of physician-coded intellectual disability (ID).

Methods: We used the 2019 Healthcare Costs and Utilization Project State Emergency Department Dataset (H-CUP SEDD) from 21 U.S. states (total visit sample of 37,013,841). States were selected based on having a zipcode in purchased data. We selected visits by autistic individuals (ICD-10 F84, $n=25,170$) with or without varying co-occurring intellectual disability (mild ID-F70; moderate ID-F71; severe/profound ID-F72-73; other/unspecified ID-F78-79). Clinical Classification Software Refined (H-CUP, AHRQ) was used to categorize ICD-10 'reason for visit' diagnosis codes into meaningful groups. We present logistic models with incidence rate ratios and robust standard errors adjusting for covariates to examine differences in reasons for visit by group (not all data presented due to space).

Results: Selected sociodemographic characteristics are presented in Table 1. The top reasons for ED visit accounting for 43% of all visits included: epilepsy, suicide/self-inflicted injury, specific co-occurring mental health conditions (e.g., anxiety, ADHD), lower respiratory disease, restlessness and agitation, gastrointestinal dysfunction (e.g., abdominal pain, nausea/vomiting), injuries/wounds, lower respiratory disorders, and connective tissue disorders. Reasons differed by co-occurring ID (Figure 1). Among other findings, results indicate that those with autism+severe/profound ID were significantly more likely to visit the ED for epilepsy than those with autism+no ID (IRR=1.61, SE=0.17). Individuals with autism+mild ID had significantly higher incidence of suicide/self-inflicted injury visits (IRR=2.23, SE=0.2) compared to those with autism+no ID. The incidence of suicide/self-inflicted injury visits was significantly higher among adults aged 18-30y (compared to 60y+), IRR=7.38 (SE=1.94).

Conclusions: Consistent with calls to differentiate practice recommendations to assure individuals across the spectrum receive appropriate and needed care, we found differing reasons for ED visit for people by type of co-occurring ID and age. Our findings support a more nuanced approach to better understanding care gaps and healthcare needs across the lifecourse and within the autism spectrum. Additional county social determinants of health associated with greater risk for ED visit for various reasons will be presented (e.g., county provider supply, internet access, education, etc.).



318.003 Evaluation of Equity in Hospice Care Utilization Among Medicare-Enrolled Autistic Older Adults

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Background: Better identification of autistic people and increased life expectancy for people with intellectual and developmental disabilities have given rise to an urgent need to better understand end-of-life care in autistic people. Although research suggests significant and pervasive disparities in the prevalence of co-occurring physical and mental health conditions in adulthood among autistic people, a more limited body of research assesses disparities in healthcare access and utilization among autistic adults, particularly at the end of life.

Objectives: Our primary objective was to compare hospice care utilization of autistic older adults to that of non-autistic older adults. The secondary objective was to determine if race, sex assigned at birth, region, and rurality altered rates of utilization in autistic older adults compared to non-autistic older adults.

Methods: We analyzed hospice claims from Medicare, which insures Americans over 65 years and covers hospice costs. We used data on a 100% sample of Medicare beneficiaries from Medicare's Standard Analytical Files (SAF) Limited Dataset. Our sample included 5,468 autistic older adults and 10,934 matched population comparison older adults who died during 2013-2021. We used variable ratio propensity score matching to match two population comparison beneficiaries to one autistic older adult; beneficiaries were matched exactly on sex, race, region, and rurality, while age and year of death were matched with a caliper of 0.2. We used multivariable logistic regression to compare these groups on the odds of any, early, intermediate, and late hospice utilization. We defined early hospice utilization as at least 28 days before death, intermediate as 4-27 days before death, and late as within 3 days of death. Interaction terms assessed whether effects were modified by beneficiary's sex, race, or rurality. In a sensitivity analysis, we repeated our analyses in unmatched samples.

Results: Overall, our autistic older adult and matched population comparison groups had similar odds of any hospice utilization (OR: 1.05; 95% CI: 0.98-1.13). Our autistic older adult and population comparison groups had similar odds of utilizing early hospice (OR: 1.01; 95% CI: 0.91-1.11), intermediate hospice (OR: 1.03; 95% CI: 0.95-1.13), and late hospice (OR: 1.07; 95% CI: 0.96-1.19). In our multivariable models evaluating the impact of other known inequities (Table 2), we did not find significant interactions between autism diagnostic status and sex, race, or rurality. Results were similar in the unmatched samples.

Conclusions: We found that autistic older adults and older adults in our population comparison group had similar odds of hospice utilization and experienced similar timing of hospice utilization. Further, we found that hospice utilization differences between autistic and population comparison beneficiaries were not moderated by sex, race, or rurality, though known disparities related to sex, race, and rurality were present in both groups. Given the body of literature documenting health disparities in autistic people, our findings are heartening, suggesting autistic older adults experience similar receipt and timing of hospice as non-autistic peers. Our findings highlight the potential power of health policies that provide zero cost, universal benefits in reducing healthcare utilization disparities among autistic people.



318.004 Falls and Injuries in Autistic Older Adults: A Critical Public Health Issue

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Background: Falls-related injuries are a major public health issue for older adults. Falls significantly contribute to mortality and morbidity, leading to decreased functional ability, loss of independence, and increased healthcare costs. Autistic older adults may be at greater risk for falls compared to non-autistic older adults due to increased rates of motor coordination difficulties including ataxia, antipsychotic medication use, and epilepsy, all known correlates of falls in the general population. Yet, no research conducted to date characterizes fall prevalence among autistic older adults. Better understanding fall prevalence among autistic older adults is the necessary first step towards developing fall prevention strategies that have the potential to decrease morbidity and mortality.

Objectives: The goals of this study were to compare: (1) the odds of experiencing a fall; and (2) the rate of falls-related injuries between autistic and non-autistic older adults.

Methods: We analyzed data from Medicare Standard Analytical Files from 2013-2021 for autistic and non-autistic older adults aged 65+. We selected age 65 as the cutoff because of Medicare eligibility criteria for older adults. The sample included 10,677 autistic older adults and 21,351 non-autistic older adults who were propensity score matched on sex, race, region, rurality, and Medicare enrollment year. We identified falls based on a well-defined set of ICD-9 and ICD-10 diagnostic codes in inpatient or outpatient encounters. We then employed an established algorithm to identify unique falls-related injuries based on clusterings of ICD-9 and ICD-10 diagnostic and procedure codes. Descriptive statistics summarized the characteristics of the beneficiaries and prevalence of falls. Multivariable logistic regression was used to compare the odds of falling between autistic and non-autistic older adults, controlling for the beneficiary's sex, race, rurality, age, year, region, and Charlson Comorbidity Index score. Finally, we used negative binomial regression to compare the rate of falls-related injuries between autistic and non-autistic older adults.

Results: Overall 47.7% (N=5098) of autistic older adults compared to 21.5% (N=4581) of non-autistic older adults had at least one fall. In total, 40.6% (N=4339) of autistic older adults compared to 18.1% (N=3866) of non-autistic older adults had at least one falls-related injury, while 33.8% (N=3605) of autistic older adults and 13.8% (N=2956) of non-autistic older adults had two or more falls-related injuries. Compared to non-autistic older adults, autistic older adults had 3.55 times higher odds of falling (95% CI: 3.36, 3.74, $p<0.0001$). Finally, the incidence rate of falls-related injuries per year was 3.07 times higher (95% CI: 2.91, 3.25, $p<0.0001$) for autistic older adults compared to non-autistic older adults.

Conclusions: We found that autistic older adults had significantly higher odds of falling and had a higher rate of falls-related injuries compared to non-autistic older adults, with nearly half of autistic older adults having at least one fall. These findings underscore the urgent need for targeted fall prevention strategies developed for autistic older adults. Implementing tailored fall prevention strategies has the potential to reduce morbidity and mortality among autistic older adults.



Oral Session -

319 - Leveraging Genetically Informed Approaches to Probe Mechanisms of Autism Associated Phenotypes

May 2nd, 2025, 4:30 PM - 5:30 PM - 608-609

Moderator: Natasha Marrus, *Washington University in St. Louis, St. Louis, MO*

n/a

319.001 Genetic and Environmental Influences on the Recognition of Mental States and the Fusiform Gyrus

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Background:

Our research suggests genetic and environmental factors influence neurological structures and their relationships with cognition and behavior in autistic twins compared to non-autistic control twins. However, we do not know how these factors affect the relationship between mental state recognition and the fusiform gyrus, the primary brain region that processes facial expressions supporting social cognition.

Objectives:

The primary objective of this investigation is to examine the impact of genetic and environmental factors on mental state recognition, morphometric properties of the fusiform gyrus, and their relationship in autistic compared to control twins.

Methods:

Same-sex monozygotic (MZ) and dizygotic (DZ) twin pairs where at least one twin was diagnosed with autism, or both were non-autistic controls (aged 6-15 years) were recruited to participate, and we obtained T1-weighted MRI scans. MRI images ($n=164$) were processed with FreeSurfer to examine brain volume. The Eyes Mental State Task assessed the ability to recognize mental states. Groups were compared using independent samples t tests. The relationships between the fusiform gyrus and Eyes Task were evaluated with Pearson's correlations. Intra-class correlations (ICC) were also computed within twin pairs and ACE modeling for broad sense heritability (a^2 =additive genetics) and environmental influences (c^2 =shared family environment, e^2 =unique environment), providing estimates for the proportion of variation associated with genetic versus environmental factors. ACE, AE, or CE models were generated based on which were the most parsimonious and appropriate.

Results:

108 twins were diagnosed with autism (88 autistic; 18 non-autistic co-twins of autistic twins; 2 with subthreshold symptoms). 70 were controls. Autistic twins (mean=16.55 $\pm$ 5.13) exhibited lower emotion recognition ($t(110)=-2.69$, $p=0.008$) compared to control twins (mean=18.82 $\pm$ 3.77). However, neither the right ($t(110)=0.32$, $p=0.748$) or left ($t(110)=0.35$, $p=0.727$) fusiform differed between autistic (mean=11641.26 $\pm$ 1471.28; mean=11787.81 $\pm$ 1425.42) and non-autistic groups (mean=11557.69 $\pm$ 1268.41; mean=11690.54 $\pm$ 1469.82), respectively. The right fusiform gyrus ($r=-0.21$, $p=0.030$) correlated with the Eyes Task across all participants but the left fusiform gyrus ($r=-0.12$, $p=0.226$) did not. Within the autistic twins, scores on the Eyes task correlated with both the right ($r=-0.36$, $p=0.013$) and left ($r=-0.34$, $p=0.021$) fusiform. However, the fusiform gyri were not correlated with scores on the Eyes Task in controls, $p>0.05$. ACE modeling revealed performance on the Eyes Task was primarily genetically mediated in both autistic ($a^2=0.62$, $e^2=0.38$) and control twins ($a^2=0.63$, $e^2=0.37$). The size of the fusiform gyrus was associated with almost equal impacts from genetic and environmental influences on both the right ($a^2=0.51$, $e^2=0.49$) and left ($a^2=0.59$, $e^2=0.41$) fusiform in non-autistic controls. Autistic twins exhibited potential genetic dominance on the size of the fusiform gyrus, but limitations in the current modeling approaches require further investigation to generate appropriate estimates.

Conclusions:

Our findings support the existing literature that individuals with autism experience challenges recognizing mental states from facial expressions, with the fusiform aiding this interpretation. More importantly, we show genetic variation affects mental state recognition similarly in autistic and non-autistic youth, although genetic factors could have a higher impact on the fusiform specifically in autistic youth. These findings warrant further investigation to determine the impact of genetic and environmental factors on these brain-behavior relationships.

319.002 Polygenic Architecture of Co-Occurring Neuropsychiatric Diagnoses in Autistic Children

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Background:

The autistic community has higher prevalences of neuropsychiatric diagnoses compared to non-autistic samples. A key question is whether these co-occurring neuropsychiatric diagnoses stem primarily from the core presentation of autism itself or from an over-representation of common neuropsychiatric genetic risk. If the latter explanation holds, we expect autistic individuals with co-occurring diagnoses to carry additional, diagnosis-specific genetic risk.

Objectives:

The objective was to describe how polygenic variation explained differences in 20 co-occurring neuropsychiatric diagnoses in a large sample of autistic children.

Methods:

We investigated the common genetic architecture of 20 neuropsychiatric diagnoses in a sample of $N=13,359$ unrelated autistic children ages 6 to 17 in the Simons Foundation Powering Autism Research for Knowledge (SPARK) cohort. Genetic methods included SNP-based heritabilities (h^2), polygenic score (PGS) associations, and polygenic transmission disequilibrium tests for over-transmission of PGS from parents to child in a subset of the sample that also had parental genotypes ($N=4,818$ complete trios).

Results:

90% of the autistic children in our sample had at least one co-occurring neuropsychiatric diagnosis, with the average number of diagnoses being four. Increasing number of co-occurring diagnoses was positively associated with PGS for ADHD, anxiety, depression, schizophrenia, and neuroticism and negatively associated with PGS for cognitive performance, educational attainment, and openness.

Overall, co-occurring learning and developmental disabilities had lower SNP heritabilities ($h^2_{\text{liability}} < 0.07$) and were not significantly over-transmitted PGS from their parents. Anxiety and obsessive-compulsive disorders also had lower SNP heritabilities ($h^2_{\text{liability}} < 0.03$). In contrast, externalizing conditions and mood disorders had higher SNP heritabilities (ADHD $h^2_{\text{liability}} = 0.17$, oppositional defiant disorder $h^2_{\text{liability}} = 0.33$, major depressive disorder $h^2_{\text{liability}} = 0.13$, disruptive mood dysregulation disorder $h^2_{\text{liability}} = 0.21$). The most frequent co-occurring diagnosis was ADHD (54%), which was associated with higher PGS for ADHD, anxiety, and depression. Autistic children with ADHD were significantly over-transmitted ADHD PGS from their parents (compared to autistic children without ADHD). The second most frequent co-occurring diagnosis was language disorder (45%), which had no SNP heritability ($h^2_{\text{liability}} = 0$). Autistic children with language disorder were not significantly over-transmitted any of the 15 PGS investigated.

Conclusions:

Our results provide evidence that common genetic variation explains a significant proportion of liability for autistic children to have co-occurring externalizing and mood disorders, including ADHD, oppositional defiant disorder, major depressive disorder, and disruptive mood dysregulation disorder. The lack of SNP heritability in learning and developmental disabilities and anxiety and obsessive-compulsive disorders indicates that common genetic variants likely play a lesser role in the manifestation of these co-occurring diagnoses *in autism* and that alternative explanations for their co-occurrence should be investigated (i.e., rare genetic variants and co-occurring diagnostic unreliability *in autism*).

319.003 Integrating Clinical and Transcriptomic Data Via Similarity Network Fusion to Identify Subtypes of Autism Spectrum Disorder in Toddlers

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Background:

Autism spectrum disorder (ASD) encompasses a wide range of symptoms, from mild social difficulties to profound impairments in cognition, language, and social abilities. Profound autism, characterized by severe symptoms, presents the highest risk for poor outcomes. While studies suggest that dysregulation of processes like embryonic neurogenesis and cell proliferation play roles, the molecular biology driving subtype-specific differences, particularly in profound autism, remains unclear. This study integrates clinical data—such as diagnostic, cognitive, and language scores—with transcriptomics to explore the biology underlying different ASD subtypes.

Objectives:

- **Identify ASD Subtypes:** Integrate clinical and molecular data using similarity network fusion (SNF) to uncover distinct clusters.
- **Characterize Subtype-Specific Molecular Dysregulation:** Analyze MSigDB Hallmark pathways and gene expression.
- **Compare Subtype-Common and Specific Pathways:** Identify both shared and unique molecular mechanisms behind mild, moderate, and profound autism.

Methods:

We used SNF to classify toddlers with ASD into clinically meaningful subtypes. We applied SNF on clinical and transcriptomic data from 363 male toddlers aged 1-4 years. Blood samples were collected, RNA extracted, and RNA sequencing performed to analyze the transcriptome. Data preprocessing involved quality control, alignment, and expression quantification. Twelve patient similarity networks (PSNs) were created using eight clinical and four transcriptomic measures. PSNs were fused using SNF to identify ASD subtypes, with spectral clustering applied for optimal subtype determination. Clustering robustness and significance were validated through statistical tests, linking subtypes to ASD symptom severity, eye-tracking measures, and differential gene expression analysis. The study also investigated mutations in ASD risk genes and examined brain activation using fMRI in a subset of subjects. Outcomes were tracked longitudinally, and clinical measure progression was modeled using linear mixed models.

Results:

SNF analysis identified four clinical-gene expression clusters with distinct profiles, including a profound autism cluster (Cluster 4) with severe symptoms and 100% diagnostic stability over time. Robust statistical validation confirmed the reliability of these clusters. Clinical scores showed significant differences between clusters, particularly for social, language, and cognitive abilities, with profound autism exhibiting the lowest scores. Pathway analysis revealed dysregulation in 17 Hallmark pathways for ASD, with seven being subtype-specific to profound autism. Notably, SFARI gene mutations did not differ significantly between ASD and non-ASD groups, while fMRI data indicated reduced temporal lobe activation in severe clusters. Profound autism trajectories indicated worsening outcomes, particularly in social and adaptive behavior, compared to moderate ASD subtypes.

Conclusions:

We identified subtype-specific dysregulated Hallmark pathways vital for embryonic brain development, providing insights into the biological basis of profound autism. Dysregulation in pathways and processes like glycolysis, oxidative phosphorylation, Wnt/ β -catenin signaling, and DNA repair mechanisms play crucial roles in cellular proliferation and neuronal growth. Interestingly, mutations in SFARI Level 1 and 2 ASD risk genes did not correlate with symptom severity or dysregulations, indicating that genetic risk alone cannot explain ASD heterogeneity. This work highlights the need for a multi-modal approach integrating transcriptomics, molecular, brain imaging, and clinical data to better understand ASD subtypes and develop targeted interventions. Future ASD treatment strategies should address the specific needs of each subtype to optimize outcomes.

**319.004 Calibrating Behavioral and Cognitive Instruments for Genetic Validity**

M. Elsadany, T. Sanderson, C. Strathearn and J. J. Michaelson, Psychiatry, University of Iowa, Iowa City, IA

Background: Psychologists are familiar with the need to demonstrate multiple forms of validity in behavioral and cognitive instruments, for instance face validity (i.e., superficial thematic relevance) and construct validity (i.e., items adequately capture the theoretical construct they are meant to characterize), among others. As genetic data continues to become more available in neurocognitive research, it is vital to recognize the need for “genetic validity” as a new addition to the psychometrist’s toolbox. Here, we define “genetic validity” as the degree to which weighted combinations of instrument items correlate with polygenic scores (PGS) relevant to the purpose of the instrument.

Objectives: N/A

Methods: To demonstrate the potential of genetic validity as a performance target, we present a general framework of regularized regression of tests (e.g., survey items or cognitive subtests) to predict a polygenic score calculated for each participant. We applied this framework in two experiments involving the ABCD study (N=9752) as a training set, and a local neuroimaging sample of gifted and twice-exceptional individuals (N=39) as a test set to gauge the real-world utility of genetic validity. First, we used Child Behavior Checklist (CBCL) items as predictors of the polygenic score for autism. Second, we used NIH Toolbox subtest scores as predictors of the polygenic score for cognitive performance. These experiments resulted in weights (betas), that, when applied to the results of the CBCL or NIH Toolbox cognitive battery, yield quantitative estimates of genetic propensity for autism and cognitive performance, respectively.

Results: In our test set sample, both the autism propensity score (APS) and cognitive performance propensity score (CPS) were positively and significantly correlated with diagnosis and full-scale IQ (FSIQ), respectively (p-values: 1.9×10^{-4} and 1.8×10^{-7}). When compared to neuroimaging features, the APS showed a significant positive correlation with fractional anisotropy (FA) in the corpus callosum (p-value: 0.0085) and a negative correlation with the mean diffusivity (MD) in the inferior longitudinal fasciculus in both left and right hemispheres (p-values: 0.002 and 0.004, respectively). Additionally, a principal components analysis (PCA) on both APS and CPS and found a strong correlation between PC1 and both FA and MD of the same tracts. This suggests that the link between APS and diffusion metrics might also involve cognitive functions and how they are represented in ASD.

Conclusions: Together, these findings suggest that genetic validity can be a powerful indicator of construct validity, i.e., that an instrument captures individual variation that is meaningful on a fundamental, biological level. Ongoing work is investigating the relationship between the APS and CPS with neuroimaging features.

Oral Session -

320 - Service Delivery

May 2nd, 2025, 4:30 PM - 5:30 PM - 606-607

Moderator: Michele Villalobos, *Pediatrics, University of Utah, Park City, UT*

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320.001 Health Inequities among Autistic Transgender Individuals

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Background: Examining population-level outcomes among autistic transgender individuals can inform understanding of their service needs. Previous research has used health data to identify and describe outcomes among transgender populations (Proctor et al., Jasuja et al), relative to cisgender individuals (gender identity corresponding with sex assigned at birth). Identifying transgender individuals can support priorities to address identified needs.

Objectives: Identify chronic conditions and service needs of transgender autistic adults to advance the understanding of their healthcare needs.

Results: More than 2,100 transgender autistic individuals (16.6% with co-occurring ID), 680 transgender individuals with ID, and 593 transgender individuals without autism or ID were identified. Comparison cisgender groups of 432,584 autistic individuals (52% with co-occurring ID), 825,552 individuals with ID, and 536,902 individuals without autism or ID were identified. Across groups, most individuals were ages 18-29, including 77.4% of transgender autistic individuals (with or without ID). Among autistic transgender individuals, 9.3% were Black, 9.4% were other race/ethnicity, and 71.6% were white.

Among transgender individuals, 20% of autism only, 19.2% of autism + ID, 17.8% of ID only, and 14.7% of no autism or ID had 4-5 chronic conditions compared to cisgender groups (8.1% of autism only, 11.1% of autism + ID, 14.2% of ID only, and 8.7% of no autism or ID). Among transgender individuals with autism or ID, more than half had depression, bipolar, or other depressive mood disorder or anxiety disorder (averages: 61.6% and 56.9% respectively).

Conclusions: This study identified autistic transgender individuals chronic conditions and other service needs. In particular, depressive/mood and anxiety disorders and service access were priorities. Improved data collection to understand their service and support needs is urgently needed.

320.003 Facilitators to Mental Healthcare for Autistic LGBTQ+ Young Adults: Insights from a Community-Partnered Phenomenological Study

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Background: Autistic young adults are at an increased risk for mental health challenges compared to their non-autistic age-mates (Crane et al., 2019). Autistic LGBTQ+ people are at a compounded risk for mental health problems due to multiple minority stressors (e.g., discrimination; Botha & Frost, 2020). Compared to autistic cisgender heterosexual adults, autistic LGBTQ+ people are twice as likely to have a psychiatric diagnosis and are more likely to report being denied care by a medical provider (Hall et al., 2020). Despite these evident risks, few studies have examined the first-hand experiences of autistic LGBTQ+ in the mental healthcare context, and what factors facilitate their access to care.

Objectives: This study is part of a larger investigation of the first-hand experiences of autistic LGBTQ+ young adults (18-28 years old) with regard to their mental health and interactions with the U.S. mental healthcare system. Here, we present themes related to facilitators to mental healthcare for autistic LGBTQ+ young adults.

Methods: This study utilized a community-partnered, phenomenological approach. Each aspect of the study was conducted in collaboration with five autistic LGBTQ+ adults who became the Autistic LGBTQ+ Advisory Group. Twenty autistic LGBTQ+ participants ($M_{Age} = 23.3$ years) completed oral or text-based interviews about their mental health and mental healthcare experiences. Interviews were coded inductively by two members of the study team who achieved substantial interrater reliability (Cohen's Kappa = .69). Thematic analysis (Braun & Clarke, 2006) of the interviews generated themes related to barriers and facilitators to mental healthcare for autistic LGBTQ+ young adults. Here we present themes related to facilitators to care.

Results: Almost half of interviewees (9/20) identified as gender fluid, nonbinary, or gender expansive, and more than half reported having anxiety, depression and/or ADHD. The majority of participants faced identity-specific barriers to mental healthcare, which are described in a forthcoming paper from our group. Some participants successfully accessed care (e.g., therapy) and were satisfied with the supports they received. In the face of numerous barriers to adequate care, participants described finding alternative coping and self-care practices that were promotive of their mental health. Facilitators to accessing the traditional mental healthcare system included the following themes: 1) finding 'safe' providers who are equipped to support diverse autistic people and 2) connecting to care through a system I am a part of. Facilitators of improved mental health outside of traditional care included: 1) individual practices (e.g., using special interests to self-regulate) and 2) community-based care (i.e., connecting with other autistic LGBTQ+ people and using those connections to find vetted providers).

Conclusions: We identified several factors that increase access to mental healthcare for autistic LGBTQ+ young adults, from their own perspectives. Accessing care was easier for those who were already embedded in a healthcare system with wrap-around care (e.g., university health center). Community care and individual coping practices were critical to participants' mental health. Mental health providers working with this population may benefit from including these individualized practices into their care plan (e.g., using special interests as tools for emotion regulation).

320.004 Psychiatric Emergency Visits of Autistic Adults with or without a Coexisting Borderline Personality Disorder Label in Their Health Record

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Background:

Autistic individuals who have been given a borderline personality disorder (BPD) diagnosis often present with complex mental health needs, leading to frequent use of psychiatric emergency department (ED) services. Sex-assigned-at-birth may also affect whether a BPD label is given to an autistic individual. Limited research has explored psychiatric ED presentations in autistic people with versus without a BPD label. This large-scale chart-review study at an urban tertiary psychiatric ED aims to address this significant knowledge gap.

Objectives:

(1) To compare the primary reasons for ED visits between autistic individuals (aged ≥ 16 years) with and without a BPD diagnosis noted in their ED visit records. (2) To examine whether sex-assigned-at-birth, BPD diagnosis, and whether autism is noted in the ED visit documentation influence restraint use and disposition plans.

Methods:

Data were extracted from electronic medical records (EMR) for ED visits for autistic patients at an urban tertiary psychiatric hospital in Toronto, Canada, from January 1, 2018, to December 31, 2020. Autism was identified based on a formally recorded DSM-5 Autism Spectrum Disorder diagnosis in the EMR, either before, at or after the ED visit. Demographic data were compared between individuals with and without a BPD diagnosis recorded during the ED visit. The primary reasons for ED visits, restraint use (chemical and/or mechanical), and disposition outcomes (discharge or admission) were compared using chi-square tests across all visits, and mixed-effect logistic regression models across unique autistic individuals. The impact of BPD diagnosis alongside autism diagnosis mentions in the chart (implying that the BPD and/or autism diagnosis was known to the clinician at the visit) and sex-assigned-at-birth were specifically assessed for associations with restraint use and disposition outcomes.

Results:

In 2018-2020, 345 unique autistic individuals (aged 16-63 years) made 1027 ED visits. Of all visits, when autism was recorded in chart, 33.5% had BPD recorded as well. When autism was not noted in the ED record, BPD appeared more frequently (12.7%, p -value < 0.001). Autistic individuals assigned-female-at-birth (AFAB; 20.6%) and those with intellectual disabilities (16.8%) were more likely to have a BPD label noted (Figure 1). Visits of autistic individuals with BPD noted were more likely to be primarily due to suicidality (24.3%) and less likely due to homicide/aggression (4.9%), self-harm (4.7%), anxiety (1.5%), substance withdrawal (0.4%), or medication adjustment (1.8%) (Table 1). Analyzing unique autistic individuals, BPD was only significantly associated with suicidality as the reason for ED visits (odds ratio, OR 4.366, 95% confidence interval, CI [2.659, 7.169], $p < 0.001$). Neither sex-assigned-at-birth, BPD, nor autism mention during the visits significantly correlated with discharge or admission plans. Amongst autistic individuals with BPD noted, those who were assigned-male-at-birth (AMAB) were less likely to be restrained than AFAB individuals (OR 0.350, 95% CI [0.139, 0.881], $p = 0.026$).

Conclusions:

Autistic adults with autism mentioned in their ED charts had a lower rate being concurrently labeled BPD during those visits. BPD labels were most associated with suicidality as the primary reason for ED visits. Further investigations should understand how care is provided to autistic individuals in ED settings.

**Oral Session -****321 - Therapeutic Biomarkers in Autism**

May 2nd, 2025, 4:30 PM - 5:30 PM - 4C-1,2

Moderator: Jill Silverman, *Department of Psychiatry and Behavioral Sciences, UC Davis MIND Institute, Sacramento, CA*

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321.001 Epl/ASD013 As a Dual-Target Therapeutic for Autism Spectrum Disorders: Modulating Glutamate Excitotoxicity and Neurobehavioral Symptoms

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Background:

Current treatment strategies for Autism Spectrum Disorders (ASD) predominantly focus on managing co-morbid symptoms through pharmacotherapies. However, there is a lack of pharmacological interventions targeting core symptoms of ASD. Growing recognition of novel therapeutic targets, particularly those modulating neurobiological pathways linked to ASD, has led to the exploration of dual-active molecules.

Objectives:

In this study, we evaluate the potential of EPL/ASD013, a dual-target molecule screened based upon pharmacophore modelling to inhibit both Histone Deacetylase 2 (HDAC2) and Histamine H3 Receptor (H3R) from our previous study. This dual inhibition aims to address two crucial facets of ASD pathology: glutamate excitotoxicity and behavioral disturbances, including anxiety, sleep disorders, and cognitive impairments.

Methods:

In-vitro studies using primary astrocytic cultures evaluated EPL/ASD013's impact on gene and protein expression, as well as glutamate clearance. In-vivo efficacy was tested using a Valproic Acid (VPA)-induced rodent model of ASD, with significant improvements observed in anxiety, social interaction, curiosity, strength, coordination, and cognition through various behavioral tests. Morphological changes were assessed via hematoxylin and eosin staining, and expression levels of EAAT2, HDAC2, and H3R were analyzed using RT-PCR, immunohistochemistry, and western blotting. Intraperitoneal kinetic profiling and high-dose toxicity assessments confirmed the compound's safety.

Results:

Our in vitro studies revealed significant insights into EPL/ASD013's effects on astrocytic cells, particularly focusing on HDAC2, Excitatory Amino Acid Transporter 2 (EAAT2) gene expression, and glutamate regulation. Treatment with EPL/ASD013 resulted in dose-dependent upregulation of EAAT2 mRNA and protein expression, as well as downregulation of HDAC2. Notably, high-dose EPL/ASD013 treatment enhanced intracellular glutamate uptake, suggesting improved glutamate homeostasis. In vivo, using a well-established animal model of ASD induced by valproic acid (VPA), EPL/ASD013 demonstrated significant improvements in neurobehavioral outcomes. Behavioral assays such as the Open Field Test and Marble Burying Test indicated a reduction in anxiety and anxiety-related repetitive behaviors in high-dose treated groups. Furthermore, the Sociability Index and Novelty Preference Tests showed improvements in social interactions, while the Morris Water Maze test demonstrated enhanced spatial learning and memory retention. These findings suggest that EPL/ASD013 can reverse cognitive impairments commonly seen in ASD. At the molecular level, EPL/ASD013's dual-target mechanism of action was further validated by the observed dose-dependent upregulation of EAAT2 and the downregulation of HDAC2 and H3R. Pharmacokinetic analysis of EPL/ASD013 in both plasma and brain tissue highlighted its favorable profile, with a sustained half-life and significant drug exposure in the central nervous system.

The safety profile of EPL/ASD013 was confirmed through clinical panel blood tests and histopathological evaluations, which showed no signs of toxicity or adverse effects, even at the highest therapeutic dose of 30 mg/kg. This, coupled with its neuroprotective effects in the hippocampus and improvements in neurobehavioral symptoms, suggests that EPL/ASD013 could be a promising therapeutic candidate for ASD.

Conclusions:

In conclusion, EPL/ASD013 demonstrates potential as a dual-targeted therapeutic for ASD, addressing both glutamate excitotoxicity and behavioral symptoms. Further studies are warranted to investigate its long-term efficacy and safety in other ASD models, as well as its potential application in clinical settings.



321.002 Distinct Protein Expression in Umbilical Cord Blood of Individuals with Autism Spectrum Disorder

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Background:

Autism Spectrum Disorder (ASD) is a complex neurodevelopmental condition with high heritability. Genetic factors are associated with the autistic phenotype in 30–40% of children diagnosed with ASD. Despite substantial advances in genetic research, the precise cause of ASD remains unclear, suggesting that environmental factors may also play a crucial role. Stressors such as ischemia, maternal immune activation (MIA), and toxins have been linked to the development of ASD, either through direct effects on the brain or by inducing mitochondrial dysfunction and endoplasmic reticulum (ER) stress. These processes, in turn, are associated with perturbations in neuronal differentiation, potentially disrupting synaptic protein function and impairing neural circuit formation.

Extracellular vesicles (EVs) are membrane-surrounded nanovesicles routinely excreted by cells, containing proteins, lipids, nucleic acids, and metabolites, and play a role in cell-to-cell communication. EVs mainly originate from the Golgi system, ER, or, to a lesser extent, direct exocytosis from cellular or mitochondrial membranes. The content of EVs extracted from plasma reflects physiological processes occurring in body tissues, including the brain. Thus, disrupted processes, in the brain, characteristic of ASD may be evident in their protein profiles.

Objectives:

The aim of this study was to investigate the protein composition in children with ASD at birth and compare it to that of neurotypical (NT) children. We hypothesized that the protein profile in idiopathic ASD would reveal differences associated with MIA, mitochondrial dysfunction, and ER stress.

Methods:

The study was conducted on 30 children with idiopathic ASD and 30 NT children. EVs were extracted from plasma collected from their cord blood, and mass spectrometry-based proteomic analysis was used to identify the protein content. Only proteins found in more than 21 children in each group were included in the analysis. Statistical analysis was performed using Python statistical packages.

Results:

Mass spectrometry identified 2,924 proteins, with 565 proteins showing differential mean expression levels between the groups. A striking finding was the exceptionally lower variance in protein expression within the ASD group. STRING analysis classified the differing proteins into three major clusters: mitochondrial (aerobic respiration, ATP synthesis, and uncoupling proteins), ER stress, and neutrophil secretory proteins. Cytoscape analysis indicated that a substantial portion of the proteins (140/565) potentially originated from the brain. Based on the Human Protein Atlas, 13 proteins representing each cluster were predominantly expressed in the brain. Using machine learning algorithms, we identified 11 significant proteins capable of differentiating samples originating from ASD. These proteins, along with the most dominant brain proteins, are associated with mitochondrial and ER stress.

Conclusions:

The findings suggest that mitochondrial dysfunction and ER stress are present in children with ASD at birth, processes that are associated with abnormal brain development, specifically synaptogenesis and myelination. Post-mortem studies of children diagnosed with ASD have found similar pathophysiological patterns. The distinct protein profile of children diagnosed with ASD and the homogeneity within the group raise the hypothesis that mitochondrial dysfunction and ER stress represent a common and potentially necessary pathway leading to abnormal brain microstructure and an increased susceptibility to developing ASD.

321.003 Validation of Plasma microRNAs As Biomarkers for Early Diagnosis of Autism Spectrum Disorder

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Background: Autism Spectrum Disorder (ASD) is a complex neurodevelopmental disorder characterized by social communication challenges and repetitive behaviors. Early diagnosis is crucial for effective intervention and improved outcomes; however, there are currently no approved biomarkers for ASD diagnosis. MicroRNAs (miRNAs) are small non-coding RNAs that regulate gene expression and have emerged as promising biomarkers for various neurological disorders, including ASD. In our previous discovery study, we identified dysregulated expression of several miRNAs in the plasma samples of children with ASD aged 5–12 years.

Objectives: In this study, we aimed to validate the altered expression of these plasma miRNAs in a younger cohort with ASD (ages 2–4 years) and explore their potential use as diagnostic biomarkers for early diagnosis of ASD.

Methods: A total of 108 young children aged 2–4 years were recruited, including children with ASD (n=66) and age- and sex-matched control subjects (n=42). Using next-generation sequencing and advanced bioinformatics, we validated the differential expression of 17 miRNAs in ASD that exhibited consistent dysregulation in our current and previous cohorts.

Results: We also observed significant correlations between several miRNAs and the age of the study participants, suggesting that age is a key factor influencing dynamic miRNA changes, particularly in the ASD group. Pathway analysis linked these miRNAs to critical regulatory networks involved in neurodevelopment and immune responses. Finally, we found that a combination of four miRNAs (miR-4433b-5p, miR-15a-5p, miR-335-5p, and miR-1180-3p) showed an area under the curve (ROC-AUC) of 0.936 (95% CI = 0.892, 0.980; $p < 0.001$), which demonstrated the diagnostic accuracy of the four-miRNA panel in ASD diagnosis.

Conclusions: This study findings reinforce the potential use of the four-miRNAs as robust biomarkers for ASD and lay the groundwork for future research into miRNA-based diagnostic tools and therapeutic strategies for ASD.

321.004 Linking Gut Microbiome to Cingulate Cortex Morphology and Clinical Symptoms in Autism Spectrum Disorder

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Background: Growing evidence suggests the influence of gut microbiota on autism spectrum disorder (ASD), yet the relationships between gut microbiome composition, brain structure, and clinical symptoms are not well-elucidated. The high prevalence of gastrointestinal issues in ASD individuals and documented differences in gut microbial composition compared to typically developing individuals suggest a potential gut-brain connection. Neuroimaging studies have identified structural alterations in the cingulate cortex of individuals with ASD, a region crucial for social-emotional processing and cognitive function. While previous studies have separately examined gut microbiota alterations and brain structural changes in ASD, no research has simultaneously investigated the associations among gut microbiome profiles, cingulate cortex morphology, and autistic symptoms.

Objectives: To elucidate the complex relationships among gut microbiome profiles, cingulate cortex morphology, and autistic symptoms in individuals with ASD.

Methods: We enrolled 231 participants, including 139 with ASD and 92 typically developing controls (TDC), aged 4-18 years. ASD The clinical diagnosis of ASD was made according to DSM-5 criteria, further confirmed by using the Autism Diagnostic Interview-Revised and Autism Diagnostic Observation Scale with parents and autistic participants, respectively. Full-length 16S rRNA gene sequencing was performed on fecal samples to characterize gut microbiota. Structural MRI assessed cortical thickness and surface area of cingulate subregions using FreeSurfer 7.2.0. Group differences in microbial diversity and abundance were analyzed using various indices, followed by correlation analyses between ASD-specific microbiota, cingulate cortex metrics, and symptom severity, controlling for age, sex, Full-scale IQ, body mass index, and food preference.

Results: Beta diversity analyses revealed distinct microbial community structures between ASD and TDC groups, while alpha diversity showed no significant differences. Linear discriminant analysis effect size identified an increased abundance of Enterococcaceae, Lachnospiraceae, and Coriobacteriaceae families in ASD. Notably, the abundance of family Enterococcaceae and genus Enterococcus was negatively correlated with cortical thickness in the left isthmus and posterior cingulate ($\rho = -0.19$, $p = 0.006$; $\rho = -0.17$, $p = 0.017$, respectively) while positively correlating with isthmus cingulate surface area (right: $\rho = 0.14$, $p = 0.049$; left: $\rho = 0.21$, $p = 0.003$). Higher Enterococcaceae abundance was associated with more severe autistic symptoms ($\rho = 0.098$, $p = 0.037$). Additionally, increased left isthmus cingulate surface area significantly correlated with greater symptom severity ($\rho = 0.25$, $p < 0.001$). Functional prediction analysis suggested alterations in pyrimidine metabolism pathways between groups.

Conclusions: This study provides novel evidence for gut-brain-behavior relationships in ASD, highlighting specific associations between Enterococcaceae abundance, cingulate cortex structure, and clinical symptoms. These findings suggest that the gut microbiota could impact brain development and the presentation of ASD through alterations in cingulate cortex morphology, particularly within the isthmus region. Our results support the potential role of the gut-brain axis in the pathophysiology of ASD and suggest new directions for biomarker development and therapeutic interventions targeting the gut microbiome. Future longitudinal studies are needed to establish causal relationships and further delineate the underlying mechanisms driving these associations.

Oral Session -

322 - Shaping Perceptions and Policies: Autism Across Life Stages and Social Contexts

May 2nd, 2025, 5:30 PM - 6:30 PM - 6B

Moderator: Heather Brown, *Educational Psychology, University of Alberta, Edmonton, AB, Canada*

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322.001 Shaping Young Minds: How Autism Labels, Environment, and Developmental Factors Affect Preschoolers' Acceptance of Autistic Behaviors

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Background:

In inclusive educational settings, it is crucial to understand how neurotypical (NT) children perceive and accept autistic behaviors. Previous studies have emphasized the importance of early exposure to autism in fostering acceptance and reducing stigma (Turnock et al., 2022). However, little is known about how NT preschoolers perceive autistic behaviors and how various environmental and developmental factors influence these perceptions.

Objectives:

This study aimed to investigate how NT preschoolers in inclusive classrooms evaluate autism-related behaviors and the individuals displaying them. We explored the role of autism labeling, along with environmental factors (e.g., socioeconomic status, parental attitudes, and knowledge about autism) and developmental factors (e.g., age, empathy, and theory of mind) in shaping these evaluations.

Methods:

Ninety-two NT children (age: 5.26 ± 0.30) from an inclusive kindergarten, where each class includes at least one autistic child, participated in a "flap hands task" (Sargent & Jaswal, 2022). They listened to six short stories featuring a character exhibiting autism-like behaviors, such as hand-flapping. The children were split into two groups: in one, the character was labeled as "autistic," while in the other no labels were given. Children then evaluated these behaviors regarding acceptability, punishment, willingness to befriend the character, and their likelihood of mimicking the behaviors.

Additionally, we measured children's empathy and theory of mind (ToM). We also assessed children's family socioeconomic status (SES), which included parents' education levels, family income, and subjective SES. We further explored parents' attitudes and knowledge about autism, as well as whether children had prior exposure to information about autism. Mann-Whitney U tests, generalized linear models (GLM), and natural language processing (NLP) techniques were employed to analyze the children's performance.

Results:

The findings revealed that when characters were labeled as autistic, children perceived their unconventional behaviors as more acceptable and less deserving of punishment, leading to a more positive attitude toward autistic peers (Figure 1). Notably, NLP analysis indicated a change in children's language: without the autism label, they described the characters' behaviors as "disturbing others," whereas with the label, they emphasized that the characters "had no choice." This shift was further supported by sentiment analysis, which showed a more favorable attitude toward autism-labeled characters. Additionally, our GLM analysis showed environmental factors, including parental attitudes toward inclusive education and children's exposure to autism information, positively predicted children's acceptance of autistic behaviors. In contrast, SES and parental knowledge of autism had no significant impact. Regarding developmental factors, children's ToM significantly predicted their acceptance of autistic behaviors, while age and empathy did not (Figure 2).

Conclusions:

Our findings underscore the importance of autism labeling and various environmental and developmental factors in shaping NT preschoolers' understanding and acceptance of autistic behaviors. These results have important implications for promoting inclusivity and reducing stigma in early childhood educational settings.



322.002 Shifting Views, Shaping Outcomes: Exploring the Relationship between Teacher Perceptions and Autistic Students' School Experiences

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Background: The school context can be a challenging socioemotional setting for autistic children; they are often at risk for social exclusion, bullying, and internalizing symptoms (Lai et al., 2019; Wainscot et al., 2008). Autistic first-person accounts reflecting on early school experiences reported that teachers reinforced ableist stigma (Cohen et al., 2022; Mueller, 2021). As school environments frequently serve as a source of socialization but also stigma for autistic students (Aubé et al., 2021), teachers can be a crucial source of neuroaffirming views. Teachers' perceptions of students can also shape student-teacher relationship quality and students' emotional and behavioral adjustment (Murray & Zvoch, 2011). This study focuses on understanding how general education teachers perceive autistic students and how these perceptions shape students' school experiences.

Objectives:

- To investigate three dimensions of teacher perceptions (i.e., strengths/deficit-based, holistic/reductionist, and external/internal locus of control) of their autistic students through open-ended descriptions.
- To explore how these perceptions predict student-teacher relationship quality and student socioemotional well-being.
- To assess which dimensions of perceptions most strongly predict student-teacher relationship quality and student socioemotional well-being.

Methods: Participants included 47 K-2 general education teachers (92.9% female; 55.4% White; 80.4% with a graduate degree; 80.4% without professional autism training) with at least one autistic student in their classroom, all enrolled in an autism professional development (PD) program. To assess teachers' perceptions, we coded their written responses to the question: "...take a moment to think about your autistic student...add a few words or word phrases that describe your student..." Two independent raters coded the degree to which these responses reflected strengths/deficit-based perceptions, holistic/reductionist perceptions, and external/internal locus of control. Teachers rated student-teacher relationship quality using the Student Teacher Relationship Scale (STRS; Pianta, 2001) and students' socioemotional well-being using the Social, Academic, and Emotional Behavior Risk Screener (SAEBRS; Kilgus et al., 2014) and BASC-3 Behavioral and Emotional Screening System (BESS; Kamphaus & Reynolds, 2015).

Results: The plurality of teachers expressed perceptions that were deficit-based (44.7%) and expressed an internal locus of control (46.8%); however, most teachers (74.4%) expressed a holistic or partially holistic view of their student. Preliminary analyses revealed that all three dimensions of teacher perceptions predicted student-teacher conflict and externalizing problems ($p < .05$), but only strengths/deficit-based and holistic/reductionist perceptions predicted socioemotional behavior in the classroom ($p < .05$). None of the three dimensions of perceptions predicted student-teacher closeness or internalizing problems ($p > .05$). When all three dimensions of perceptions were considered together, teachers' external attributions of locus of control was the dimension that most strongly predicted lower student-teacher conflict ($B = -3.02$, $p = .071$), while strengths/deficit-based perceptions most strongly predicted more favorable levels of social behaviors ($B = 1.25$, $p < .001$), emotional behaviors ($B = 1.13$, $p = .004$), and externalizing problems ($B = -1.15$, $p = .028$).

Conclusions: Our analysis indicated that teachers generally held more deficit-based holistic perceptions, attributing an internal locus of control to autistic students. Teacher perceptions of autistic students may be a pivotal predictor of student-teacher relationships and students' socioemotional well-being. Adopting more autism-affirming teacher attitudes, including strengths-based, holistic perceptions that attribute an external locus of control, may foster enhanced relationships and well-being for autistic students.



322.003 What Do Autistic Parents Really Need? a Participatory Study Revealing Diverging Perspectives between Autistic Individuals and Professionals

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Background:

While it is increasingly recognized that autistic individuals can be parents, there is still little research focused on parenthood in autism (McDonnell & DeLucia, 2021). Existing studies highlight the positive aspects of parenting for autistic individuals and their strong parenting skills (Pohl et al., 2020). However, challenges such as organizational difficulties, sensory overload, and communication barriers with healthcare professionals are also reported. Moreover, autistic parents often express fears regarding the involvement of child protective services (Donovan, 2020). Research shows that parents with developmental disabilities face a higher risk of having their children removed from their care (Theodore et al., 2018). We suggest that this may be partly due to professionals' lack of training, which can lead to a gap between how autistic individuals and professionals perceive autism and the needs of autistic parents, as well as reinforce prejudices. These can impair the support autistic parents receive, sometimes leading to negative outcomes for parents and their children.

Objectives:

This study aimed to investigate the differing perceptions that autistic individuals and professionals have regarding autistic parents and their needs. The ultimate goal is to inform professional training and guide policy development.

Methods:

This research objective and priority was identified by autistic parents through a participatory approach. A small research group was formed in 2020, including three autistic adults (two of whom were mothers, and one was a researcher) and two non-autistic researchers. Together, the team developed a clinical case describing an autistic mother in a hospital setting with her child, along with a questionnaire. These were distributed online in France. From May 2023 to May 2024, the study was completed by 122 individuals who had received an autism diagnosis and 988 professionals from various fields, including healthcare, psychology, paramedics, speech therapy, social work, education, and the legal system.

Results:

Both autistic parents and professionals agreed that the clinical case described atypical behavior in the mother, especially before knowing the diagnosis. However, professionals expressed greater concern than autistic individuals about the mother ($p < .001$) and were more likely to suggest child protective services involvement ($p < .001$). Notably, legal professionals were the most likely to indicate this. Regarding autistic parents' needs in general, while both autistic parents and professionals recognized the importance of workplace adaptations, household help, and administrative support, autistic parents were more likely to highlight these needs than professionals ($p < .001$). Conversely, professionals were more likely than autistic parents to emphasize the need for child protective services ($p < .001$).

Conclusions:

This participatory study confirms some of the fears expressed by autistic individuals and supports our hypotheses about discrepancies between their perspectives and those of professionals on autistic parenting and related needs. The findings underscore the need for enhanced autism training for professionals, particularly in the legal system. Additionally, the study reveals unmet needs voiced by autistic parents—needs that are sometimes recognized by professionals but remain unaddressed in France. Moving forward, we aim to present these findings at an institutional level to advocate for policy changes that will improve support for autistic parents.

322.004 Exploring Sex Differences in Caregiver Report of the Autism Diagnostic Journey Based on Results from the SPARK Events History Calendar Interview Questionnaire

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Background: The autism diagnostic journey is described as one that presents significant challenges for families navigating medical systems, education planning, and intervention services. In the United States, diagnostic delays are prolonged by racial and sociodemographic factors (Lappé et al., 2016). Seeking to better understand how sex differences further impact the diagnostic journeys of autistic individuals within racial groups, this study examines responses to the Events History Calendar Interview (EHCI) Questionnaire utilizing a large online U.S. cohort, SPARK. The EHCI is an electronic adaptation of the Constantino et al. (2020) interview version, developed to allow for broader dissemination and collection of caregivers' perspectives at a national scale.

Objectives: To identify potential sex differences within the relationships between 1) age of caregiver's first concern, 2) age of diagnosis, and 3) initiation of ASD intervention services among 4 racial groups.

Methods: 871 participants with sex data from the EHCI Questionnaire were categorized into 4 racial groupings: White (n=583, 137 female), Black/African American (n=103, 19 female), Asian (n=36, 19 female), and Multiracial (n=149, 40 female) (see Table 1 for additional demographic data). Relationships between the ages of caregiver's first concern, diagnosis, and initiation of services were evaluated using bivariate correlations with a covariate of sex at birth within each group

Results: Bivariate correlations yielded significant differences in age of first concern, age of diagnosis, and initiation of services across racial groups and sex (See Table 2). Age of first concern was significantly correlated with age of diagnosis in Asian and White children, with no significant differences according to sex at birth. Asian females displayed a strong relationship between age of first concern and initiation of services ($r = 0.64$, $p < 0.001$), significantly higher than other racial groups, and higher than that seen in males. The same was true regarding initiation of services and age at diagnosis ($r = 0.34$, $p < 0.001$), although a weaker association. Overall, females across all racial groups expressed stronger positive correlations among all variables related to age of onset and services, as compared to their male counterparts.

Conclusions: This analysis highlights compelling disparities between different racial groups, and between males and females, in relationships between age of first concern and clinical attention. These results strongly support previous research findings of significant delays in parental concerns, diagnostic age, and intervention initiation for autistic females. Delayed identification and intervention results in overwhelming downstream implications related to functional outcome. Further analyses will look to examine additional data on diagnostic severity and cognitive ability with respect to implications for diagnostic and functional outcomes.



Oral Session -

323 - Brain Structure and Neuropathology

May 2nd, 2025, 5:30 PM - 6:30 PM - 6C

Moderators: **Christine Ecker**, *Department of Child and Adolescent Psychiatry, University Hospital, Goethe University, Frankfurt am Main, Germany*

Hsiang-Yuan Lin, *Centre for Addiction and Mental Health, Toronto, ON, Canada*

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323.001 Neurobiological Underpinnings of Co-Occurring Mental Health Conditions in Autism

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Background: Many autistic people (> 20-50%) experience co-occurring mental health conditions, including anxiety and depression. These conditions frequently persist across development, and their symptom severity can fluctuate over time. This can significantly affect psychological and physical wellbeing and reduce quality of life. Hence, a better understanding of the contributors to co-occurring conditions in autism may facilitate future mental health support for those who want or need it. Initial research has traced altered clinical profiles in autism to variation in neuroanatomy; but how anxiety and depression, as well as change in anxiety and depression across time, relate to neuroanatomy remains unclear. **Objectives:** Hence, we aimed to identify neuroanatomical patterns underpinning anxiety and depression, and change in anxiety and depression, in autistic and neurotypical individuals across age. We further aimed to examine how these patterns relate to variation in clinical and genomic profiles.

Methods: To examine this, we analysed cross-sectional and longitudinal behavioural (parent and self-reported clinical measures of anxiety and depression, Beck inventory) and neuroanatomical (structural magnetic resonance imaging) data from 639 individuals (360 autistic, 279 neurotypical, aged 6-31 years) collected at two time points (T1 and T2, separated by ~12-24 months). First, we identified spatial patterns in cortical thickness (CT) and surface area (SA) variation that best explained clinical profiles at T1, and change in profiles from T1 to T2, using partial least squares regression. Next, we tested how neuroanatomical profiles correlated with autism traits (measured using the Social Responsiveness Scale 2 [SRS-2], Repetitive Behaviors Scale [RBS], and Short Sensory Profile [SSP]); and genomic variation using the Allen Human Brain Atlas.

Results: We identified patterns in CT and SA that explained a significant amount of variance in anxiety (21-57%) and depression (17-49%); and in change in anxiety (29-64%) and depression (35-74%). Anxiety at T1 was underpinned by neuroanatomical variation in prefrontal, pre/postcentral, and occipital regions; while change in anxiety was linked to variation in precentral and occipital regions. Depression at T1 was related to neuroanatomical variation in precentral, temporal, and parietal areas; and change in depression related to variation in parietal and occipital regions. Neuroanatomical profiles underpinning cross-sectional, but not longitudinal, measures of anxiety and depression correlated with all three autism traits. Specifically, neuroanatomical profiles associated with greater mental health problems correlated with greater symptom scores (parent-rated; $|r| \geq 0.27$, $p \leq 0.0005$). Further, neuroanatomical profiles were transcriptomically enriched for genes linked to atypical neurodevelopment, including e.g., those regulating maturing excitatory neurons, endothelial cells, and excitatory deep layer neurons (enrichment odds ratio $OR \geq 2.7$, $p_{FDR} < .05$).

Conclusions: Our results suggest that co-occurring mental health conditions, and change in these conditions over time, may each have distinct neural substrates. These substrates, involving widespread cortical regions and multiple neuroanatomical features, may further vary across the autism spectrum, and be linked to various biological mechanisms. Once validated, our observations may support the development of tailored interventions, e.g., targeting mechanisms linked to relatively poorer outcomes.



323.002 Detecting Divergent Structural Connectivity in Autism Via Multisite Harmonization

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Background:

Investigation of structural connectivity in autism using diffusion MRI (dMRI) based structural connectomes has not produced consistent findings, primarily due to small sample sizes of individual studies and high heterogeneity in autism. To maximize information gleaned from existing studies, it is essential to integrate data retrospectively while overcoming extensive site-related differences. Solving this need requires specialized harmonization paradigms to address statistical complexity of structural connectomes while preserving biological variability. We anticipate that harmonized data will facilitate robust detection of autism-related patterns by increasing pooled sample size.

Objectives:

To propose a harmonization paradigm for pooling structural connectomes from retrospective studies, and to investigate divergence in structural connectivity associated with autism in a large, pooled cohort.

Methods:

We analyzed dMRI of 1503 participants (1194 neurotypicals and 309 autism, aged 6-21 years) from 6 sites (Table1). Structural connectomes were created by parcellating the brain into 86 regions defined by Desikan-Killiany atlas and performing probabilistic tractography, with streamline counts used as connectivity weights, yielding 86x86 connectivity matrices. Since connectivity weights were non-gaussian distributed, we modeled edgewise weights using a gamma-distributed generalized linear model (gamma-GLM) with a log link, incorporating site, sex, age, and age² as covariates. Site-related coefficients were estimated edgewise from neurotypicals alone and applied to harmonize structural connectomes for autism and neurotypical groups. Removal of site effects was validated using ANOVA tests on harmonized edgewise weights and 6 graph topological measures, controlling for sex, age, and age². We assessed group-level differences and group-by-age interactions in graph measures in harmonized data between autistic and neurotypicals. Only males (n=890) were included in this analysis. We further tested Spearman correlations between graph measures and autism clinical assessments, controlling for age. We compared harmonized structural connectomes to unharmonized data where site covariate was regressed out at the level of graph measures.

Results:

Among 1480 edges after consistency-based thresholding, 1377 (93%) exhibited significant site effects pre-harmonization ($p < 0.05$). Site effects at all edges were non-significant following gamma-GLM harmonization (Fig.1A). Additionally, all derived graph measures showed significant site effects before harmonization ($p < 0.05$), while none were significant after harmonization (Fig.1B).

Unharmonized data revealed no group-level differences in graph measures. A weak group-by-age interaction in clustering coefficients (standardized $\beta = 0.16$, $p = 0.043$) and a marginally significant interaction for global efficiency (standardized $\beta = 0.16$, $p = 0.052$) were noted (Fig.1C top), but no measures were linked to clinical scores.

Post harmonization, males with autism showed significantly higher intra-hemispheric strength compared to neurotypicals (Cohen's $d = 0.37$, $p = 0.041$). Significant group-by-age interactions were observed for clustering coefficient (standardized $\beta = 0.27$, $p < 0.001$) and global efficiency (standardized $\beta = 0.26$, $p = 0.002$), with both measures increasing with age in autism but decreasing in neurotypicals (Fig.1C bottom). Intra-hemispheric strength positively correlated with SRS-2 t-score ($R = 0.12$, $p = 0.012$), while clustering coefficient ($R = 0.15$, $p = 0.006$) and global efficiency ($R = 0.14$, $p = 0.013$) correlated positively with VABS communication subscale.

Conclusions:

Our gamma-GLM harmonization can effectively remove site-related differences in structural connectomes for retrospective data integration. With gamma-GLM harmonized structural connectomes from 6 sites, we observed hyper intra-hemispheric connectivity and divergent age-related patterns in clustering coefficient and global efficiency in autistic children compared to neurotypicals.



323.003 Pubertal Timing Effects on Anterior Pituitary Volume and Symptomology in Autistic Adolescents from the ABCD Study
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Background: Puberty is sorely understudied in autism spectrum disorders (ASD), yet studies suggest potential increases in symptom severity during adolescence for some autistic individuals. During normative development, puberty instigates massive reorganization of neural circuitry and behavior necessary for successfully transitioning into adulthood. Although this is a rapidly growing area of research in normative populations, research examining puberty in autistic individuals is in its nascence. Thus, this study will begin to address this novel topic by examining a brain region implicated in pubertal hormone production – the anterior pituitary gland (PG). Anterior PG volume increases with rising pubertal hormone levels and has established links with mental health during adolescence in non-autistic adolescents. Understanding how similar processes unfold in autistic adolescents could garner much-needed insights into pubertal effects on neurodevelopment and mental health in ASD.

Objectives: The current study sought to explore how pubertal timing affects anterior PG volume in autistic adolescents compared to controls and whether diagnostic status moderates relationships between anterior PG size, pubertal timing, and elevated autism symptomology (Figure 1).

Methods: The final sample will include 276 adolescents from the Adolescent Brain Cognitive Development (ABCD) study with T1-weighted MRI scans and pubertal timing data (i.e., Pubertal Development Scale regressed onto age) who are matched on age, sex, race, ethnicity, IQ, household income, and parent education. Anterior and posterior PG lobes were manually traced using preliminary data from a random sample from the final sample ($N = 100$; 50 ASD; 23 ASD girls, 27 ASD boys, $M_{\text{age}} = 10.01$ ($SD = 0.62$)). Tracing reliability was performed on 15% of the pilot sample with good reliability for the anterior and posterior PG tracings ($ICCs = .91, .84$, respectively). Analyses were conducted using ANCOVA models to examine group by pubertal timing interactions on anterior and posterior PG volumes, and group by pubertal timing by anterior PG volume interactions on autism symptom severity (age, sex, total intracranial volume as covariates).

Results: Preliminary results from the 100 matched participants revealed a group by pubertal timing interaction predicting anterior PG volume ($F_{(1,99)} = 5.06, p = .03$), but *not* posterior PG ($F_{(1,99)} = 1.61, p = .21$). Simple slopes analyses revealed that in later maturing adolescents in particular, TD adolescents exhibit *smaller* anterior PG volumes than ASD adolescents (Table 1). In addition, there was a significant group by pubertal timing by anterior PG volume interaction predicting social responsiveness scale (SRS) scores ($F_{(1,98)} = 4.64, p = .03$). Follow-up analyses revealed that in those with earlier pubertal timing, compared to TDs, ASD adolescents exhibited stronger associations between anterior PG volume and elevated SRS scores (all $p < .01$).

Conclusions: Results suggest that there are key group differences in how pubertal timing affects anterior PG (but not posterior PG) volume and autism symptom severity. This work highlights the utility of examining the anterior PG in populations who may have puberty-specific increases in symptomology. Moreover, findings here corroborate and extend work showing autistic adolescents experience a potential deterioration in functioning during puberty by providing a potential neural mechanism that may explain individual differences in ASD.



323.004 Linking Brain Microstructure to Behavioral Severity in ASD: Associations of G-Ratio and Conduction Velocity with Behavioral and Cognitive Metrics

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Background: Autism spectrum disorder (ASD) is a neurodevelopmental disorder marked by impairments in social communication and the presence of restrictive, repetitive behaviors. While diagnosis is traditionally based on cognitive and behavioral assessments, identifying biomarkers that link these behaviors to neurobiological differences remains a challenge. Previous research from our lab suggests that ASD individuals exhibit reduced axonal conduction velocity and alterations in the g-ratio (the ratio of axon diameter to myelin thickness), implying structural differences in white matter pathways. This study expands upon previous findings by exploring associations between brain microstructure metrics and a range of behavioral assessments commonly used in the clinical evaluation of ASD.

Objectives: This study aims to identify behavioral metrics that are most strongly associated with neurobiological differences in individuals with ASD. In addition, it seeks to compare the relative associations of two neuroimaging-based metrics—conduction velocity and g-ratio—with cognitive and behavioral performance. Finally, the study aims to explore whether neuroimaging metrics can serve as early biomarkers for predicting both ASD diagnosis and symptom severity, providing insight into the neurobiological foundations of ASD.

Methods: **Participants:** 273 participants (148 with ASD and 125 neurotypical), aged 8 to 17 years, matched for age and sex, were recruited from the NIH Autism Centers of Excellence cohort. Each participant completed a battery of cognitive and behavioral assessments, including the Autism Diagnostic Observation Schedule (ADOS), Behavior Rating Inventory of Executive Function (BRIEF), and Social Responsiveness Scale (SRS-II). **Neuroimaging:** Diffusion MRI was employed to evaluate brain microstructure, focusing on g-ratio and conduction velocity. Image processing followed standard protocols, including FOD modeling and fixel-based analysis. Microstructural data were examined across 214 brain regions of interest (ROIs). **Statistical Analysis:** Linear models were used to assess correlations between neuroimaging metrics and behavioral subscales, adjusting for age, sex, and IQ. Multiple comparisons were corrected using the Benjamini-Hochberg method. Two machine learning clustering analyses were also conducted to uncover latent patterns in neuroimaging and behavioral data.

Results: Significant associations were identified between conduction velocity and multiple behavioral metrics, particularly in the BRIEF subscales measuring executive function and emotional regulation. Conversely, g-ratio exhibited stronger correlations with behavioral metrics in ASD-only analyses, particularly in the motor cortex and white matter regions. Within the ASD cohort, g-ratio correlated with severity scores on the ADOS and CBCL tests, while conduction velocity associations were weaker. Machine learning analyses revealed clusters of participants aligned with gradients in brain microstructural maturity. These clusters corresponded to distinct behavioral profiles, suggesting neurodevelopmental variability underlying behavioral differences in ASD.

Conclusions: This study demonstrates that brain microstructural metrics, particularly g-ratio, are significantly associated with behavioral severity in ASD. The results suggest that axonal diameter, rather than myelination alone, plays a crucial role in the neurobiology of ASD, with possible implications for identifying early biomarkers. These findings highlight the value of integrating neuroimaging and behavioral assessments to enhance the understanding and prediction of ASD severity, potentially enabling earlier and more accurate diagnoses.



Oral Session -

324 - Assessing Language & Communication Skills in Individuals with Profound Autism

May 2nd, 2025, 5:30 PM - 6:30 PM - 6A

Moderator: Alison Singer, Autism Science Foundation, New York, NY

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324.001 Investigating the Relation between Fine Motor Skills and Expressive and Receptive Language Skills in Minimally Verbal Autistic Adults Using Structural Equation Modeling

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Background: Research suggests that the motor system plays an important role in spoken language development for individuals with autism (Mody & McDougle, 2019). In autistic children and adolescents, fine motor skills are positively associated with expressive and receptive language skills (Hwang & Lee, 2024). This positive relation between motor skills and language skills has also been found in samples of minimally verbal (MV) autistic children and adolescents (Butler & Tager-Flusberg, 2022; Chen et al., 2024; Pecukonis et al., 2019). However, no studies to date have examined this association in MV autistic adults.

Objectives: To investigate the relation between fine motor skills and expressive and receptive language skills in MV autistic adults. We predicted that higher fine motor skills would be associated with higher language skills.

Methods: The sample included 31 MV autistic adults (10F, 21M) 19 to 32 years old ($M=23.75$). MV status was determined using the following criteria: 1) entirely non-verbal/non-speaking; 2) ability to produce less than 30 words or word approximations spontaneously; and/or 3) Expressive Vocabulary Test (EVT-3) scores ≤ 1 st percentile. We used correlation analyses and structural equation modeling (SEM) to examine the association between fine motor skills and expressive and receptive language skills. SEM is a statistical method that allows for exploration of associations between observed variables and latent factors by combining principles of factor analysis with multiple regression analysis. Fine motor skills were measured using the Grooved Pegboard Test (GPT), the Beery-Buktenica Test of Visual-Motor Integration (VMI-6), and the caregiver-report Vineland Adaptive Behavior Scales (VABS-3) fine motor subscale. Expressive language skills were measured using the EVT-3 and the caregiver-report MacArthur-Bates Communicative Development Inventory-Words and Sentences (MCDI) vocabulary subscale. Receptive language skills were measured using the Peabody Picture Vocabulary Test (PPVT-5) and the Clinical Evaluation of Language Fundamentals (CELF-5) sentence comprehension subscale. Participant age and sex were included as covariates in the model.

Results: Zero-order correlations are reported in Table 1 and the model is summarized in Figure 1. The model included three factors (fine motor, expressive language, and receptive language skills) which were composed of raw scores from the measures listed above. Fine motor skills were significantly and positively associated with expressive ($\beta=.719/B=1.656$, $SE=.152$, $p<.001$) and receptive language skills ($\beta=.611/B=1.047$, $SE=.235$, $p=.010$). Participant sex was significantly associated with expressive ($\beta=.395/B=2.124$, $SE=.172$, $p=.022$) and receptive language skills ($\beta=.475/B=1.903$, $SE=.223$, $p=.034$), with female participants demonstrating higher language skills than male participants. The overall model indicated good fit ($\chi^2(18)=19.930$, $p=.337$; CFI=.978; TLI=.958; RMSEA=.059; SRMR=.087), and explained 84.2% and 71.5% of the variance in expressive and receptive language skills, respectively.

Conclusions: Fine motor skills were positively associated with expressive and receptive language skills in MV autistic adults, supporting the growing body of evidence that the motor system is involved in both the production and comprehension of spoken language. Future studies should explore whether targeting fine motor skills through intervention leads to improvements in language skills for MV autistic adults. Further research is needed to determine whether current findings replicate in a larger sample of MV autistic adults using longitudinal data.



324.002 Examining Adaptive Behavior and Communication in Non/Minimally-Speaking Individuals with Profound Autism

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Background: Profoundly autistic individuals who are non- or minimally-speaking communicate through many modalities, including vocalizations, gestures, body movements, facial expressions, and augmentative technology. These individuals are often well understood by caregivers or those close to the individual; however, many language/communication assessments struggle to measure their communicative abilities and compare it to other measures of development, such as adaptive behavior. The Rapid Online Sample of Communication (ROSCO) is a new communication sampling protocol that is administered over Zoom and records naturalistic communication behaviors between a caregiver and non/minimally-speaking individual. Caregiver knowledge of the communication is captured during a structured interview after ROSCO.

Objectives: This research performs an exploratory analysis of the relationship between scores on an existing adaptive behavior assessment and the types of communicative interactions between caregivers and their non/minimally-speaking children.

Methods: N=19 non/minimally-speaking individuals (2-12years; 8M:11F) completed a 15-minute ROSCO session, which includes everyday interactive activities like mealtime, free play, and watching a video that buffers unexpectedly to elicit mild frustration and communication opportunities. During the structured post-ROSCO interview, the caregiver re-watches the recorded ROSCO session with an examiner and describes the action, directedness, and function associated with communication attempts during ROSCO. This analysis examines functions associated with behavior-regulating communication like requesting or rejecting something (REQ+REJ), as well as social interactions or commenting by the child (SOC+COM). Frequency of communicative acts was defined as the count of the function divided by session duration. Some individuals completed multiple sessions, for which their counts were averaged. Caregivers also completed the Vineland Adaptive Behavior Scales (VABS-3; Interview). Linear regression models were used to examine possible preliminary correlations between function frequencies and VABS-3 composite standard scores (SS), subdomain v-scale scores, and growth scale values (GSVs).

Results: SOC+COM frequencies and VABS-3 scores were positively correlated across all score categories, while REQ+REJ frequencies held no consistent relationship. Moderately high explained variances were observed between SOC+COM frequencies and Adaptive Behavior Composite SS ($R^2 = 0.4277$; see figure), Receptive Language V-scale (0.5817), Domestic Daily Living Skills GSV (0.5319) & V-scale (0.4923), Personal Daily Living Skills V-scale (0.5811), Interpersonal Relationships GSV (0.5442), and Play-Leisure GSV (0.4064). Less variance was explained between SOC+COM frequencies and Communication Composite SS (0.3325) and Expressive Language GSV (0.3141). Consistent trends were not observed between REQ+REJ and any VABS-3 scores.

Conclusions: The relationship between higher SOC+COM frequencies and VABS-3 Daily Living Skill (assessing skills like eating, dressing, chores, and safety) and Socialization subdomains (assessing eye contact, understanding of emotions, and ability to play with others) may reflect the ability to engage in and learn from a social environment as more social communicative skills emerge. The lack of relationship between early developmental communicative functions (e.g., requesting/rejecting) and VAB-3 scores may reflect a limitation of the VABS-3 in capturing sensitive or reliable measures for this population before more social behaviors have emerged. Future work will further examine communicative functions by continuing to explore function categories and analysis with a larger sample, as this study is ongoing. Analyses with other behavioral assessments will be done for comparison.



324.003 Assessing Communicative Capacity in Minimally Verbal Autistic Individuals: Validation of the Low-Verbal Investigatory Survey (LVIS)

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Background: Approximately 30% of autistic individuals are minimally or low verbal (MLV), a condition that significantly impacts their quality of life and service use. Given the heterogeneity of communicative profiles in autism, it has been challenging to reliably predict which children without productive language in toddlerhood will develop language and which will remain MLV and could benefit from alternative and augmentative forms of communication. Current measures of communicative capacity are often time-intensive, expensive, and require significant training to administer. This has limited the use of these measures in clinic and research settings alike. Where brief screening tools do exist, they are often normed on neurotypical populations and fail to capture the multi-dimensional nature of language acquisition in autism. The Low-Verbal Investigatory Survey (LVIS) was developed to address this gap.

Objectives:

This study aims to:

1. Assess the convergent and divergent validity of the LVIS with gold-standard measures of language and autism symptoms in a large and diverse sample of autistic children.
2. Determine whether correlations between LVIS scores and established measures of communication differ by socioeconomic status, race, or ethnicity.
3. Identify data-driven cut points for clinical indications of MLV status.

Methods: Data were collected via an online survey from 764 participants (Table 1), recruited through the Simons Foundation Autism Research Initiative (SPARK) sample. Participants completed the LVIS and other established measures of communication and autism symptomatology. The survey included demographic questions to assess the influence of socioeconomic status, race, and ethnicity on LVIS scores.

Results: The LVIS demonstrated strong convergent validity with established language measures, and a three-factor structure of Verbal Communication, Non-Verbal Communication, and Atypical Communication (Figure 1). The LVIS scores correlated significantly with Vineland Communication domain scores, $R(543) = 0.76, p < .001$ and Age of First Words, $R(643) = -0.34, p < .001$. Weaker correlations with Vineland Daily Living, $R(545) = 0.59, p < .001$, and Motor Skills, $R(310) = 0.53, p < .001$, suggest divergent validity. Analysis of the effects of demographic factors suggest comparable LVIS scores as a function of race and ethnicity with two exceptions. Participants who identified as White had higher Verbal Communication Scores ($p = .016$) and participants who identified as African American had lower Verbal Communication Scores ($p = .042$). A cut point of 16 on the LVIS resulted in sensitivity of .74 and specificity of .81 relative to parent report of verbal status.

Conclusions: The LVIS is a valid and efficient tool for assessing communicative capacity in MLV autistic individuals. It requires minimal time, money, and training to administer, making it suitable for diverse research and clinical settings. This ease of administration and ready availability makes it more feasible for the LVIS to be administered in large and diverse groups. Information collected in larger samples can help us understand the heterogeneity of communicative profiles in autism and potential mechanisms that contribute to such a large proportion of autistic individuals remaining minimally verbal into adulthood.

**324.004** Remote, in-Home Assessment of Spoken Language in Low- and Minimally Verbal Autistic Children

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Background:

Traditional research methods often fail to capture the communication behaviors of profoundly autistic or minimally verbal individuals. In this presentation, I will first describe a remote data collection protocol designed to meet autistic children where they are and show the kinds of information it can yield. To illustrate its ability to provide information about even profoundly autistic children's oromotor skills, I will present results of a preliminary kinematic analysis of speech production from 2D video. Finally, I will describe ongoing work employing advanced analytics that we hope will reveal much about speech and oromotor ability in this population.

Previous work has shown that a perceptually-judged measure of speech production in low- and minimally verbal autistic individuals (percent correct speech repetition) accounts for significant variance (46%) in a measure of expressive language (number of different words from a language sample)¹. Other work has shown that an acoustic measure of speech production in low- and minimally verbal individuals (normalized acoustic distance between the vowels in "bee" and "baa") accounts for significant variance (26%) in Vineland Expressive Language subtest raw scores².

Objectives:

Here, we tested whether a kinematic measure of speech production, cross-correlation of upper- and lower-lip velocity, would account for significant variance in a measure of expressive language. Cross-correlation between the velocity of the upper and lower lips is a measure of speech production skill that develops over time as children learn to use the upper lip in coordination with the lower lip and jaw during speech³.

Methods:

Parents completed the Vineland Adaptive Behavior Scales. Children participated in several short tasks by Zoom, lasting under an hour total: A 15' parent-child interaction, a speech repetition task, a feeding task, and a "resting face" task where children watched a video of their choice while their faces were videotaped.

Children's oral movements were analyzed from 2D Zoom video using a now-discontinued program (DynamiXyz Performer[®]). Specifically, movement of the upper and lower lips was tracked during production of the syllable "ba" in 19 autistic children (4 F) aged 4;6-7;10. A linear regression was run to determine whether upper- and lower-lip velocity cross-correlation contributed significant variance to Vineland expressive language scores.

Results:

The overall model was significant, $F(1,17) = 4.413$, $p = 0.05$. Cross-correlation between the velocity of the upper and lower lips accounted for 20.6% of the variance (R^2) in Vineland Expressive Language v-score.

Conclusions:

Results are consistent with previous findings that speech production significantly contributes to expressive language ability in low- and minimally verbal autistic children. Here, a kinematic measure of lip movement during syllable production, derived from 2D video, replicates this effect. The results show that remote assessment of spoken language can be carried out with profoundly autistic children non-invasively and from their homes and that even simple, non-stressful tasks can yield rich, valid data. Ongoing work includes validating remotely-collected data against the same data collected in person, and nonlinear dynamical analyses (using Google FaceMesh) of how head movement relates to autism core symptoms and mouth movement relates to expressive language.

**Oral Session -****325 - Social and Emotional Outcomes in Young-Mid Adulthood**

May 2nd, 2025, 5:30 PM - 6:30 PM - 611-614

325.001 Autism and Mental Health Outcomes from Childhood to Adulthood: Evidence from the Avon Longitudinal Study of Parents and Children (ALSPAC) Cohort

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Background:

Autistic children and adults are more likely to experience mental health problems. However, the mechanisms behind the increased risk of mental health problems in this population are less well known. Longitudinal studies following up children into adulthood with information on potential intermediate variables are crucial to the understanding of modifiable factors behind such associations.

Objectives:

- To describe the Avon Longitudinal Study of Parents and Children (ALSPAC) and its contributions as a longitudinal resource to understand the mental health outcomes of children with autism and autistic traits.
- To investigate the longitudinal association of autism/autistic traits with depression up to age 28 years, and the potential mediating role of traumatic experiences.

Methods:

ALSPAC is a population based birth cohort, which contains detailed prospectively-collected information on parents and children from pregnancy to adulthood. It recruited 14,541 pregnant women from Bristol and surroundings, UK, with expected dates of delivery 1st April 1991 to 31st December 1992 (further recruitment and enrolment after the age 7 increasing enrolled pregnancies to 15,447), with 14,901 children alive at one year of age. Children with an autism diagnosis have been identified by multisource case ascertainment. Four independent autistic trait measures have been identified as being the most predictive of 93 developmental measures predicting an autism diagnosis- including the social communication difficulties checklist (age 7), the coherence subscale of the Children's Communication Checklist (age 9); repetitive behaviours (age 5), and sociability temperament (age 3 years). Further, a measure of broad autism phenotype has been derived and polygenic risk scores for autism in the cohort have been estimated for those with genome-wide association (GWAS) data ($n > 6000$), based on the most recent autism GWAS. Mental health outcomes including depression, anxiety, self-harm and psychotic symptoms have been assessed at multiple time points throughout childhood into young adulthood. Extensive data on potential confounders is available. Mixed-effects growth-curve models were used to estimate the trajectories of depressive symptoms by autism/autistic traits from age 10 to 28, further stratified by presence/absence of trauma exposure. Confounder adjusted associations between autism/autistic traits and depression in adulthood were also estimated and the role of childhood trauma was investigated via mediation analysis.

Results:

All autism variables demonstrated increased depressive symptom trajectories between ages 10-28 years. In line with previous ALSPAC investigations on mental health outcomes of autism/traits (which will be summarised in this talk)- social communication difficulties were the trait most strongly associated with a depression diagnosis in adulthood (age 24 OR= 2.15; 95%CI:1.22-3.76). Trauma and autistic traits combined to further increase depression symptom scores. Mediation analyses provided evidence for direct pathways between autistic traits and increased risk of depression alongside indirect pathways through increased risk of trauma.

Conclusions:

Depressive symptom trajectories in autism/traits emerging in childhood persist into adulthood. Preventative efforts against adverse mental health outcomes in autistic adults may need to focus on earlier experiences such as trauma in the adolescence period.

325.002 Postsecondary Landscape for Autistic Young Adults

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Background: The most used source of information about young adults transitioning into the community, the National Longitudinal Transition Study (NLTS2), is decades old, offering little knowledge about the contemporary generation of autistic young adults transitioning out of school and into employment, postsecondary education, and community-based activities at a time when their numbers are increasing. The purpose of this study is to describe the current status of a national sample of autistic young adults after they finished school and transitioned into postsecondary education, employment, and community.

Objectives: This study provides a contemporary snapshot of postsecondary life for 211 autistic young adults who participated in the Center on Secondary Education for Students with Autism (CSESA) study from 2015-2018. The young adults and their caregivers reported on their engagement in education, employment, and social interaction and completed standardized measures related to self-determination, adaptive behavior, and family functioning 1-5 years post high school.

Methods: CSESA team members re-recruited young adults and their caregivers from the original sample based on contact information obtained as part of the original study. Data collection was completed via online questionnaires, paper questionnaires, and interviews. The measures included a demographic form, three standardized assessments about young adult characteristics (Scales of Independent Behavior, Self-Determination Scale, Adolescent and Young Adult Activities Card Sort), two standardized measures about caregiver experiences (Family Empowerment Survey and Zarit Burden Interview), and three project-developed measures that gathered information about young adults' experiences and participation.

Results: The young adults ranged in age from 17-25 (mean = 20.2). 84% of the follow-up sample identified as male, 15% as female, and 1% as nonbinary. 34% identified as non-white, including 12% Black, 5% Asian, 3% Native American, and 6% multi-racial. 17% identified as Hispanic/Latino.

Approximately 66% of young adults reported being involved with each employment and education activities after high school. About 11% of young adults reported no involvement with either employment or educational activities. Young adult report of social engagement was higher, with over 85% reporting having friends and meeting new people and nearly 75% reporting calling or texting friends. Only 3% reported no engagement in social activities. Most lived at home (85%) with 10% living independently. Approximately 84% of caregivers reported at least some use of services since high school.

More detailed results from the standardized assessments and caregiver reports can be found in the attached tables.

Conclusions: The autistic young adult participants in the CSESA study differed from previous generations in that they were more likely to have been diagnosed earlier, participated in early intervention, experienced evidence-based practices, had a formal transition plan, and to some degree were prepared for transition out of school. The general finding is that autistic young adults have more employment experiences, more social engagement, and are engaging in more community activities. We still have far to go in terms of policies, services, and supports to ensure autistic young adults can access both an independent and interdependent life in the community.



325.003 Self-Reported Strengths and Difficulties of Autistic Young Adults

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Background: The neurodiversity movement has called for research to include autistic voices and focus on strengths within the autistic community (Huntley et al., 2019). However, the majority of existing research is still from non-autistic perspectives with a focus on impairments and challenges (DePape & Lindsay, 2016; Russel, 2019). Understanding strengths and difficulties can inform how to tailor strength-based clinical support in areas of need explicitly expressed by autistic individuals. Moreover, studies have shown that the ability to identify and utilize strengths helps improve overall well-being for autistic adults (Taylor et al., 2023). Therefore, the current study aims to understand strengths and difficulties reported by autistic adults.

Objectives: To identify the self-reported strengths and difficulties of autistic adults using qualitative data.

Methods: We took an inductive coding approach to analyze free-text responses provided by autistic adults to two questions, “*What are your strengths?*” and “*What are your primary difficulties at this time?*”. Data was drawn from a larger study of self-reporting independent adults (18 to 35 years old, 52% assigned male at birth) with a childhood diagnosis of autism recruited from the SPARK research match registry (Zheng et al., 2021). A subsample of 292 individuals responded to the strengths question, and 294 responded to the difficulties question. Four independent coders and a content expert carried out the iterative in-vivo coding process, and different pairs of team members coded each response. Any coding discrepancies were resolved through consensus discussion.

Results: The research team generated nine substantive themes, resulting in 55 codes associated with strengths and 47 associated with difficulties (see Table 1 for themes and descriptions, Figure 1 for code word cloud). Four major themes pertaining to self-reported **strengths** emerged: interpersonal skills (46%), mental/cognitive abilities (40%), specialized knowledge/interests/skills (32%), and overcoming adversity/grit (31%). The most frequently mentioned strengths were kind/caring, smart/intelligent, creative, and resilience/mental strength. Five major themes pertaining to self-reported **difficulties** emerged: everyday life challenges (38%), mental/cognitive challenges (32%), interpersonal skills challenges (30%), emotional wellbeing/mental health challenges (26%), and physical health challenges (17%). The most frequently reported difficulties included socializing, financial challenges, emotional challenges, and unemployment/finding a job.

Conclusions: Participants reported a wide array of strengths and challenges, highlighting the heterogeneity of autistic experiences. Interestingly, autistic adults most frequently reported interpersonal skills as a strength while it was the third most frequently reported difficulty. While many existing services focus on interpersonal deficits among autistic adults, participants often reported difficulties with mental health, finances, employment, and physical health. Our findings underscore the importance of working with autistic individuals collaboratively in research and clinical work to identify their personal experiences of strengths and challenges. Moreover, the reported difficulties emphasize the need for wraparound services to support autistic adults, as participants reported difficulties extending beyond those commonly associated with autism. Additional research is needed to understand the underlying causes of these difficulties and how to improve existing support services based on self-reported autistic strengths.



325.004 Emotion Regulation Strategies, Gender, Gender Diversity and Assigned Sex at Birth: Associations with Depressive and Anxious Symptomatology in Autistic Adults

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Background: Depression and anxiety are common co-occurring psychiatric conditions in autistic adults,^{1,2} and are present at elevated rates relative to general population estimates,^{1,3-5} although reasons for this enhanced risk are poorly understood. Emotion regulation [ER] challenges, prevalent in autism,^{6,7} are associated with depression and anxiety.⁷ While risks for depression and anxiety are particularly elevated in autistic gender-diverse people and those assigned female sex,⁸ extant research on ER has involved male-predominant-or-exclusive samples, and typically youth samples. To our knowledge, no study has examined assigned-sex and gender identity and ER, a critical gap in the literature.⁹

Objectives: In this preregistered study,¹⁰ we 1) characterized ER strategies (adaptive [cognitive reappraisal; CR] and maladaptive [expressive suppression; ES]) in autistic adults based on gender, gender-diversity and assigned-sex, separately; and 2) examined associations of ER strategies and gender, gender-diversity and assigned-sex, separately, with depressive and anxious symptomatology.

Methods: An intentional sampling strategy sought to recruit an ethno-racially representative sample of autistic adults aged 18-30y from SPARK's Research Match registry.¹¹ 225 autistic adults ($M=25.6y$, 42.2% White, non-Latina/o/e) reported their gender and assigned-sex, and completed the following measures of ER strategies, depressive symptoms and anxious symptoms, respectively: Emotion Regulation Questionnaire [ERQ],¹² Patient Health Questionnaire [PHQ-9],¹³ and Generalized Anxiety Disorder 7-item [GAD-7].¹⁴ Three (gender, gender-diversity, assigned-sex) multivariate analyses of variance [MANOVA] examined differences in ER strategy use, with the ERQ CR and ES subscales as dependent variables. Six hierarchical multiple linear regression models were conducted with depressive (or anxious) symptoms as the dependent variables.

The ERQ subscales were entered in the first step and, in separate models, gender (binary-male: $n=59$; binary-female: $n=88$; not binary male or female: $n=78$), gender-diversity (cisgender: $n=139$, gender-diverse: $n=86$) or assigned-sex (male: $n=66$, female: $n=159$) in the second step.

Interaction terms for ERQ subscales and gender, gender-diversity, and assigned-sex were examined.

Results: The MANCOVA revealed no significant differences in ERQ-ES or ERQ-CR based on gender, gender-diversity, or assigned-sex ($ps>.05$).

Regression modeling revealed that after accounting for the significant effects of the ERQ subscales (higher ES scores associated with more symptoms; higher CR scores with less symptoms), higher depressive and anxious symptomatology were each predicted by gender (PHQ-9: $\beta=0.188$, $t=2.922$, $\Delta p=.004$, $\Delta R^2=0.031$; GAD-7: $\beta=0.167$, $t=2.623$, $\Delta p=.009$, $\Delta R^2=0.024$); gender-diversity (PHQ-9: $\beta=0.172$, $t=2.674$, $\Delta p=.008$, $\Delta R^2=0.025$; GAD-7: $\beta=0.170$, $t=2.676$, $\Delta p=.008$, $\Delta R^2=0.025$); and assigned-sex (PHQ-9: $\beta=0.198$, $t=3.066$, $\Delta p=.002$, $\Delta R^2=0.035$; GAD-7: $\beta=0.171$, $t=2.669$, $\Delta p=.008$, $\Delta R^2=0.025$). A post-hoc ANCOVA with FDR-corrected pairwise comparisons revealed the following pattern of depressive and anxious symptoms: not binary male or female ($M_{PHQ-9}=13.1$, $M_{GAD-7}=11.8$) > binary-female ($M_{PHQ-9}=10.6$, $M_{GAD-7}=10.4$) > binary-male ($M_{PHQ-9}=9.5$, $M_{GAD-7}=8.9$), with the comparison between binary-male and those not binary male or female (PHQ-9: $p=.01$; GAD-7: $p=.03$) surviving correction for multiple-comparisons.

Conclusions: For the first time, we showed that ER strategies, while associated with depression and anxiety, do not differ in autistic adults based on gender, gender-diversity, or assigned-sex. Nevertheless, separate associations between depression/anxiety symptoms and gender, gender-diversity and assigned-sex after controlling for ER, a known risk factor in depression and anxiety, underscore the importance of considering gender and assigned-sex independently.



Oral Session -

326 - Brain and Behavioral Mechanisms and Impact of Motor Differences in Autism

May 2nd, 2025, 5:30 PM - 6:30 PM - 608-609

Moderator: Nicolaas Puts, *Forensic and Neurodevelopmental Sciences, Institute of Psychiatry, Psychology & Neuroscience, King's College London, London, United Kingdom*

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326.001 Multifactorial Behavioral Contributions to Autism-Related Differences in Imitation

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Background: Imitation plays a critical role in enhancing social-communicative reciprocity and social skill learning. Accordingly, impaired imitation may have downstream implications on the acquisition of learned, skilled behaviors in autism. Numerous behavioral and cognitive processes (e.g., social motivation, executive function, action representation, and motor execution) are thought to contribute to imitation performance, but it is unknown the degree to which differences in these domains contribute to autism-related imitation differences.

Objectives: The goals of the present study were to understand the role of various behavioral and cognitive processes (social motivation, executive function, action representation, and motor execution) in imitation performance and differences in imitation in ASD.

Methods: We assessed 7–12-year-old children ($n = 711$) with $FSIQ \geq 80$ with and without ASD, using a wide battery of performance-based and parent-report tests. These tests measured novel-gesture-imitation performance (Florida Apraxia Battery), motor execution (Movement Assessment Battery for Children (mABC-2); Physical and Neurological Examination of Subtle Signs (PANESS)), action representation (Postural Knowledge Test), social motivation (Social Responsiveness Scale (SRS)), and executive function or attentional processes (Wechsler Intelligence Scale for Children (WISC), Behavior Rating Inventory of Executive Function (BRIEF-P)). Children with ADHD were included in both non-ASD and ASD samples to improve generalization. Bootstrapped mediation analyses and cross-validated regression were utilized to quantify the role of the various processes in imitation.

Results: Non-autistic children significantly outperformed autistic children on novel-gesture-imitation performance ($t(709) = 13.03, p < .001, d = 1.05$). Mediation analyses revealed that motor execution tests most strongly mediated novel-gesture-imitation differences in autism (56% [42.8–70.5]), though effects from social motivation (21% [1.6–41.1]), action representation (23% [14.0–33.3]) and executive function (22% [12.5–32.7]) also partially mediated the relationship between autism and imitation performance. 95% bootstrap intervals were all above 0, indicating significant mediation from each process. Executive processes did not explain unique variance once adjusting for motor execution, suggesting that the executive component may in part comprise motor execution. However, motor execution tasks still mediated a moderate percentage (41%) of imitation differences in ASD after adjusting for EF. Using cross-validated regression models, the domains tested here accounted for 39% of the variation in imitation performance.

Conclusions: Several cross-domain factors may account for autism-associated differences in novel-gesture-imitation, including motor execution, action representation, social motivation, and to a lesser extent, executive function. Though the data are cross sectional, we discuss the models as evaluating a range of potential causal paths that explain why autistic children may struggle to imitate. Future research with true causal inference will require longitudinal data, particularly from earlier stages of development. Nonetheless, this research synthesizes possible contributors to autism-related-imitation differences that are often tested in isolation, which allows us to compare several competing hypotheses. This observational study is complementary to ongoing experimental work on potential factors related to autism-related imitation differences.

326.002 Motor and Socio-Cognitive Mechanisms Explaining Peers' Synchronization of Joint Action across Development in Autistic and Non-Autistic Children

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Background:

Partners coordinating their movement in time and space to reach a goal engage in joint action (JA), a fundamental component of everyday social interaction. This process relies on both motor skills and socio-cognitive abilities (e.g., Theory of Mind, ToM). Autistic children often exhibit difficulties in executing fine and gross motor tasks, inferring or predicting others' actions and intentions on the basis of their behavior (ToM), and mirroring and complementing others' movements (JA). Despite JA's importance for peer interaction, the shared contribution of motor and socio-cognitive mechanisms (ToM) to its formation is insufficiently explained.

Objectives:

The current study's aim was to explore motor skills and ToM abilities' joint contribution to JA performance with a peer partner. Mediation model assumes that the link between the dependent variable (JA) to the independent variable (Group) is better explained by indirect mechanisms that mediate this link and contribute to its more comprehensive understanding. Since theoretically motor and socio-cognitive mechanisms underlie JA constitution, we assumed that these mechanisms would jointly mediate autistic and non-autistic children's JA performance.

Methods:

This study included 84 autistic children ages 6–16 years, and 64 non-autistic children matched by age, sex, IQ, and mother education across three developmental-age groups (early childhood, 6–8.5 years, preadolescents, 8.5–12, adolescents, 12–16 years). Group differences on age and IQ were non-significant. The participants' composite score of gross and fine motor skills was assessed using the Individual Motoric Observation Scale (IMOS), while their early, basic, advanced and composite ToM scores, as rated by parents, were evaluated using the ToM Inventory (TOMI). Children also completed four-dyadic-JA tasks (side-by-side walking, face-to-face movement, imaginary-football, and crossing a narrow corridor), yielding a total JA-coordination score.

Results:

To examine possible mediation effects (indirect effects) of motor skills and ToM abilities, as parallel mediators between group and JA and to explore their joint contribution to JA performance, we used SPSS PROCESS mediation model 4. Our mediation analysis revealed a significant indirect effect of group (autism/ Non-autistic) on the total JA score through the IMOS total score, as well as a significant indirect effect of group on the total JA score through the TOMI composite score (see Figure 1).

Conclusions:

Together, motor and socio-cognitive underlying mechanisms significantly contributed to JA performance beyond the participant's diagnostic-group affiliation, elucidating the relationship between these three capabilities. This offers a novel theoretical and therapeutic perspective on autistic and non-autistic children's everyday social-motor interaction. Consequently, improving motor skills and ToM abilities can enhance JA performance, thereby positively influencing autistic children's social participation throughout their school years.



326.003 Sleep Mediates the Association between Emotion Dysregulation and Repetitive Behaviors in Autistic Children

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Background: Restricted and Repetitive behaviors (RRBs) are a core feature of Autism Spectrum Disorder (ASD), often hindering social interaction and learning opportunities, which can lead to negative developmental outcomes. Additionally, RRBs may increase parenting stress and affect parenting styles. Interestingly, RRBs have been linked to Emotion Dysregulation – ED (Giuliani et al., 2008). ED appears to be a significant predictor of unusual interests and it is positively associated with the intensity of self-injurious behaviors and repetitive sensory-motor actions (Ferguson et al., 2024). Moreover, both ED (Fisher et al., 2022) and RRBs (Hundley et al., 2016) have been associated with sleep disturbances in ASD. However, the connection between ED and RRBs, along with the mediating role of sleep in this relationship, remains poorly understood.

Objectives: we aimed at testing the role of sleep as a mediator between ED and RRBs in a sample of school-age autistic children; if so, we aimed at understanding whether sleep mediates the association between ED and low- and high-order RRBs differently.

Methods: Data were retrospectively collected from patients who attended the Child and Adolescent Neuropsychiatry Unit of an Italian Children's Hospital between 2020 and 2023. The final sample consisted of 90 autistic children (Mean age=8.8±1.8; Mean IQ=79.9 ±21.2; IQ<70= 37%; IQ>70= 63%; 19 females and 71 males). Alongside routine assessments (e.g., neuropsychiatric, cognitive and ASD symptoms evaluations), parents completed a battery of parent-report questionnaires, including the Repetitive Behaviors Scale- Revised (RBS-R), the Child Behaviour Checklist (CBCL), and the Sleep Disturbance Scale for Children (SDSC). The ED profile was computed using the Attention, Aggression, and Anxious/Depressed subscales of the CBCL, resulting in the CBCL-AAA index (Keefer et al., 2020). Additionally, the total score of the RBS-R was calculated, along with low-order RRBs (e.g., motor stereotypes and self-harming actions) and high-order RRBs scores (e.g., strong preference for sameness and narrowly focused interests), see Turner (1999). A mediation analysis was conducted with the CBCL-AAA as the independent variable, RBS-R scores (total, high-order, and low-order scores) as the dependent variables, and the total SDSC score as the mediator.

Results: Results showed the total SDSC score mediated the relationship between the CBCL-AAA and the RBS-R total score ($\beta = .1048$; 95% CI = .0036 - .2315). This mediation effect remained significant even after controlling for IQ and sex. Additionally, the total SDSC score mediated the relation between the CBCL-AAA and the low-order RBS-R score ($\beta = .1441$; 95% CI = .0362 - .2709). However, the mediation pathway for the total SDSC score was not significant for the high-order RBS-R score ($\beta = .0726$; 95% CI = -.0293 - .1912).

Conclusions: Sleep disturbances seem to mediate the relationship between ED and RRBs, even after accounting for IQ and sex. Specifically, sleep disturbances appear to mediate the relationship between ED and low-order but not high-order RRBs. Understanding the connections between RRBs and behavioral (i.e., ED) and psychophysical (i.e., sleep disturbances) symptoms could enhance treatment strategies and improve long-term outcomes for autistic individuals.

Future research should adopt a longitudinal approach to characterize deeply current preliminary findings.

326.004 Impairment in Visual-Motor Coordination in Children and Adolescents with Autism Spectrum Disorder and Intellectual Disability.

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Background: Difficulties in visual behaviour are frequently reported in children with autism spectrum disorder (ASD), as well as motor impairments, which several authors described as pervasive in this population. Moreover, early visual-motor abilities predict social communication skills during childhood. However, although the importance of sensory-motor coordination is recognized in neurodevelopment, its evaluation is not always considered, particularly in low-functioning ASD individuals. Conversely, visuomotor assessment could play a crucial role in planning specific interventions, in particular in ASD children with intellectual disability who show worse difficulties in adaptation to the social environment. **Objectives:** To assess visual-motor coordination in children and adolescents with autism spectrum disorder and intellectual disability.

Methods: Thirty low-functioning ASD subjects (age range: 5-13 years; 23 males) were recruited. Global functioning was investigated using the Vineland-II - Adaptive Behaviour Scale and Childhood Autism Rating Scale – Second Edition (CARS-2). Sensory Profile - Second Edition (SP-2) and Repetitive Behaviour Scale - Revised (RBSR) questionnaires were administered to caregivers to investigate the sensory-motor profile.

Moreover, neuro-visual assessment, including ocular motility (i.e. visual pursuit and saccadic movements), visual acuity resolution, stereopsis, visual field and contrast sensitivity, and the Developmental Coordination Disorder Questionnaire (DCD-Q) used as a checklist were performed by neuro-psychomotor therapists with specific expertise. The Spearman Correlation Test was used to analyze the relationship between different outcome measures. A p-value <0.05 was considered as significant.

Results: In our sample, 53.33% of children showed difficulties in visual pursuit, 40% showed dysfunctions in saccadic movements, and 23.33% deficit in contrast sensitivity. Moreover, a partial correlation analysis, corrected for the severity of autistic symptoms, showed that a more compromised neuro-visual profile seemed to correlate to a higher visual reactivity at SP-2 ($\rho = -0.382$; $p = 0.048$). CARS-2 scores were negatively correlated to total and subtotal DCD-Q scores ($\rho = -0.773$; $p < 0.001$), to Vineland Motor Subscale ($\rho = -0.641$; $p < 0.001$) and Vineland Daily-life Abilities Subscale ($\rho = -0.408$; $p = 0.025$) (see Figure 1). There were no correlations between CARS-2 scores and the other Vineland subscales. Finally, partial correlation analysis, corrected for age, highlighted that poorer motor performances at the general motor coordination subscale of DCD-Q were negatively related to higher intensity of stereotyped behaviours ($\rho = -0.385$; $p = 0.028$) and to higher intensity ($\rho = -0.553$; $p = 0.002$) and frequency ($\rho = -0.505$; $p = 0.005$) of self-injures behaviours assessed with the RBSR questionnaire. Similarly, poorer performances at the fine motricity subscale of DCD-Q were negatively correlated to higher intensity ($\rho = -0.430$; $p = 0.020$) and frequency of stereotyped behaviours ($\rho = -0.386$; $p = 0.038$) and to higher intensity ($\rho = -0.412$; $p = 0.027$) and frequency of self-injuries behaviours ($\rho = -0.386$; $p = 0.039$).

Conclusions: Our findings highlight the frequent presence of visual and motor impairments in children and adolescents with ASD and intellectual disability. Since visual-motor difficulties in low-functioning ASD children may be considered a clinical sign of difficulty integrating perception with action to control movement, with cascading effects on overall functioning, these results emphasize the link between motor and "core" symptoms in ASD and underline the importance of explicitly considering visual-motor skills in early interventions, as in low-functioning children.



Oral Session -

327 - Clinical Trials - Dietary and Small Molecule Treatments

May 2nd, 2025, 5:30 PM - 6:30 PM - 606-607

Moderator: Paul Wang, *Simons Foundation, New York, NY*

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327.001 “Evaluation of the Efficacy of Oral Probiotics Supplementation in Children with Autism Spectrum Disorders (ASDs): A Randomized Double Blind, Placebo Controlled Trial”

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Background:

Probiotics are live microorganisms that can offer health benefits when consumed in adequate amounts. It has been suggested that they may help reduce inflammation and modulate gastrointestinal (GI) and behavioral symptoms in Autism Spectrum Disorder (ASD) through the gut-brain axis.

Objectives:

This study aimed to assess the effectiveness of adding oral probiotic supplementation to standard treatment in improving core ASD symptoms using the Childhood Autism Rating Scale-2 (CARS-2) in children aged 2-18. Additionally, the study examined the impact of probiotics on behavioral comorbidities, cognition, sleep disturbances, GI dysfunction, and sensory issues. Changes in functional MRI (fMRI) brain connectivity and stool microbiota were analyzed in a subset of participants.

Methods:

This was a randomized double-blind placebo-controlled trial. Children aged 2-18 years fulfilling the diagnostic criteria as per DSM V for ASD and receiving standard treatment for at least 12 weeks were screened and randomised into two groups. Children with known chronic systemic illness, history of allergy and on alternative therapy were excluded. One group received probiotic *Lactobacillus rhamnosus* ATCC 21052, *Lactobacillus plantarum* ATCC 8014, *Bifidobacterium longum* subspecies *infantis* ATCC 15707 at dose of 1 billion CFU/g (Total 3×10^9) along with standard care whereas the other group received placebo packets along with standard care. Childhood Autism Rating Scale (CARS-2), Applied Behaviour Checklist (ABC), Child Behaviour Checklist (CBCL), Children's Sleep Habits Questionnaire (CSHQ), Development Quotient (DQ) and Sensory Profile-2 was done at baseline, 12 and 24 weeks. fMRI brain to assess functional connectivity changes and stool metagenomic DNA analysis for stool microbial composition were done randomly in 10 patients at baseline and 24 weeks. A total of 20 major bacterial genera identified including *Bifidobacterium*, *Escherichia-Shigella*, *Collinsella*, *Streptococcus*, *Faecalibacterium*, *Bacteroides*, and *Lactobacillus* were selected and their relative abundance was compared before and after the probiotic supplementation.

Results:

Total 103 subjects were enrolled and randomised (52-probiotic and 51-placebo), of which 13.5% were females and 56.4% had DQ $\leq 50\%$. The difference in mean CARS, ABC and CSHQ scores at 24 weeks follow up were :0.01(P=0.99); -5.16(P=0.1); 1.3 (P=0.5) respectively. Improvement seen in sensory issues, GI dysfunction and behavioural comorbidities was similar in both groups (P ≥ 0.05). On fMRI analysis of the probiotics group, post-intervention data as compared to the pre-intervention data showed significant (P=0.01) increase in functional connectivity between right Supramarginal gyrus (SMG) with right Sensorimotor cortex (SMC) inclusive of Pre and Post Central gyrus (PreCG, PostCG) whereas decreased connectivity was seen between right and left PreCG and Post CG. The probiotic supplementation improved the gut bacterial composition with an increased number of beneficial bacteria, *Lactobacilli* (P ≥ 0.05). However, no significant changes in *Bifidobacteria* were observed and the pathogenic flora like *Clostridium*, *Escherichia* and *Shigella* showed substantial reduction in both the placebo and probiotic groups.

Conclusions:

In conclusion, the study found no significant advantage of adding probiotics to standard care in improving core ASD symptoms or related issues. However, probiotics did enhance the composition of beneficial gut bacteria. Prospective multicentric studies and larger RCTs may further help in deciding the efficacy of probiotics.

327.002 Results from the Phase 2 Randomized Controlled Trial of Alogabat in Autistic Adolescents and Adults

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Background: Alogabat is a small molecule, selective positive allosteric modulator of the gamma-aminobutyric acid type A $\alpha 5$ subunit-containing receptors (GABAA $\alpha 5$ R) with the potential to improve core autism symptoms - social communication/interaction and restricted and repetitive behaviors (RRBs) - by restoring excitatory-inhibitory balance in key brain regions implicated in autism.

Objectives: Aurora Borealis was a Phase II (NCT04299464), three arm, randomized, double-blind, placebo-controlled, multicenter study to investigate the efficacy, safety and tolerability of alogabat in 15-45 years old autistic participants with an IQ score of at least 50.

Methods: 104 participants were randomized to daily alogabat 20mg (n=34), or 60mg (n=36) or placebo (n=34). The primary endpoint was change from baseline (CfB) in Vineland-3 Adaptive Behavior Composite (ABC) at week 12. Key secondary endpoints included safety/tolerability and measuring RRBs including the Repetitive Behavior Scale-Revised (RBS-R), Childhood Routine Inventory-Revised (CRI-R) and Clinical Global Impression scales of Improvement (CGI-I). Anxiety and sensory symptoms were also evaluated. Furthermore, a comprehensive array of biomarkers was used to confirm pharmacodynamic effects on qEEG and evaluate candidates of treatment-predictive and response biomarkers.

Results: At baseline, participants had a mean age of 25 years (SD=7.5) and mean IQ of 98 (SD=18.7), with 75% of male participants. Alogabat was well tolerated at doses up to 60mg/day for the applied treatment duration of 12 weeks. Overall, there were neither clinically nor statistically meaningful differences detected between either of the two tested doses of alogabat and placebo on the primary Vineland-3 endpoint capturing global adaptive functioning, or on any of the key secondary endpoints including the Vineland-3 socialization and communication domain scores, and RBS-R total score. Subgroup analyses for IQ categories (IQ $\geq$ 70 vs. IQ $\geq$ 50-69) and age categories (15-17 years vs. 18 years), and further exploratory efficacy analyses were consistent with these observations. Pharmacokinetic (PK) analyses confirmed target exposure and predicted receptor occupancy. Pharmacodynamic (PD) effects were consistent with phase 1 results, showing a significant dose-dependent increase in qEEG beta-band power. This effect persisted from week 2 to week 12. Exploratory biomarker analyses to predict response to treatment - using baseline qEEG beta-band power or genetics - did not yield robust results. ERPs to faces (N170) that have been reported previously to be prolonged in autistic individuals, showed an increased latency at the highest dose. Other exploratory biomarkers that measure effects on brain circuitry underlying social function (including eye-tracking of social images/videos and digital biomarkers of speech) did not show treatment-related effects.

Conclusions: Overall, alogabat was considered safe and tolerated in autistic adult and adolescent participants. However, despite PK and PD results demonstrating clear target and circuit engagement of alogabat in autistic adolescents and adults, the evaluation of efficacy did not show any favorable effect of alogabat. State-of-the-art biomarker deployment and implemented clinical learnings from prior clinical studies in autism translated into an ambitious and high quality study that generates important learnings for future clinical trials in autism.

327.003 Inflammatory Cytokines As Biologic Signatures of the Effect of Dietary Supplementation with Omega Fatty Acids on Autism Symptoms Among Young Children: A Randomized Controlled Trial

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Background:

Dietary supplementation with omega fatty acids has shown mixed evidence for efficacy for autism and related symptoms. Supplementation in early childhood and the particular combination of fatty acids may be critical. Mechanisms of effect are unclear, but children with ASD have elevated inflammatory markers, and certain fatty acids are anti-inflammatory. We previously reported some reductions in inflammation with fatty acid supplementation in the first Omega Heroes trial.

Objectives:

The primary objective of the second Omega Heroes trial (ClinicalTrials.gov NCT04312932) was to evaluate the efficacy of daily dietary supplementation with omega-3 and -6 fatty acids versus placebo on inflammation and to correlate changes in inflammation with changes in ASD symptoms. A second objective was to evaluate the effect of fatty acid supplementation on ASD symptoms.

Methods:

The second Omega Heroes was a single-site, fully blind, randomized, placebo-controlled trial involving 96 children ages 2-6 years with ASD. Children were allocated 1:1 to 90 days of fish plus borage oil ("fatty acids") supplementation or canola oil ("placebo"). Plasma cytokines and caregiver-reported ASD symptoms (PDD Behavior Inventory) were measured at baseline and end of trial. Changes in cytokines were tested for correlation with changes in ASD symptoms using correlation coefficients. Mixed models compared the fatty acids group to the placebo group on pre-post change in outcomes, including pre-specified tests of moderation by sex and age.

Results:

Of 96 children, 74 (77%) males, 22 (22.9%) females; 34 (35%) were ages 2-3 years, 62 (65%) were ages 4-6 years. The fatty acids and placebo groups did not differ on the change in inflammation from baseline to the end of the trial (Table 1). Changes in inflammatory markers were not correlated with changes in ASD symptoms (all Pearson r ranged -0.18 to 0.01, all $p \geq 0.10$). No main effect of fatty acid supplementation on autism symptoms was observed. There was a suggestive interaction between sex and assignment to fatty acids versus placebo (Table 2, $p=0.055$), but models stratified by sex revealed no clear effect on autism symptoms. No age-specific effects of fatty acids on autism symptoms were observed.

Conclusions:

Any effect of omega-3 and -6 fatty acids on caregiver-reported autism symptoms as measured by the PDD Behavior Inventory does not appear to operate through inflammatory pathways. Secondary outcomes including those measured by direct assessment will be examined as a next step.

Future larger studies should examine sex-specific effects in larger samples.



327.004 Improvement of Autism Spectrum Disorder Socialization Impairment after Treatment with Alpha-Methyl-Para-Tyrosine. Results and Subanalyses from the Randomized Placebo Control Parallel Cohort of a Crossover Trial

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Background:

There are no pharmacological interventions available to address the socialization impairments in Autism Spectrum Disorder (ASD). Catecholaminergic signaling has been implicated in regulating some behaviors in ASD, making it a potential target for treatment.

Objectives:

Determine the efficacy, safety and tolerability of the tyrosine hydroxylase inhibitor, d,l alpha-methyl-para-tyrosine (L1-79) for the treatment of socialization impairments in ASD. Subgroup analyses and a responder analysis were explored for the Vineland-3 Socialization Domain.

Methods:

Male and female subjects 12-21 years of age with ASD meeting inclusion criteria (See <https://clinicaltrials.gov/study/NCT05067582>) were randomized in a double-blind, placebo-controlled crossover study. Subjects were assigned to active (L1-79 200mg or 300mg BID) or placebo for 12 weeks, with 6-week washout, then the alternate treatment for 12 weeks. The primary outcome assessment was the Vineland-3 Socialization Domain. Clinical global impression of severity/change (CGI-S/CGI-C) and caregiver global impression of change of 3 most bothersome symptoms of ASD (CGI-3P) were key secondary measures. Analyses for crossover (N= 41, study completers) and parallel design (N=44, period 1 completers, 23 L1-79, 21 placebo) were conducted using a mixed repeated measures model with least square means comparisons. Vineland-3 Socialization Domain data were evaluated for the following subgroups: Socialization Standard Score (VSSS) <75 at baseline (ie, less than 5th percentile), IQ (WASI-II ≤93 and >93), and age (12-15 and 16-21 years). A responder analysis using different thresholds for improvement in the VSSS was also evaluated.

Results:

Carryover effects invalidated the crossover design, therefore parallel group data from period 1 completers were analyzed as the primary efficacy population. There were statistically and clinically significant improvements in the VSSS for L1-79 versus placebo treatment (difference: 7.94, p=0.0115). Improvements resulted from Play and Leisure (difference 2.8, p=0.01); and Interpersonal Relationships (difference = 1.5, p = 0.145) subdomains. Similar findings were seen for CGI-S and CGI-3P (CGI-S difference: -0.62, p=0.0155; CGI-3P Symptom 1: -0.6, p=0.0293, Symptom 2: -0.48, p=0.0399; Symptom 3: -0.61, p=0.0469). Subgroup analyses revealed greater improvements in the VSSS for individuals functioning below the 5th percentile at baseline (difference, 10.76, p=.008). Response was greater in higher IQ and younger age groups. The predefined responder analysis (3-point improvement from baseline in VSSS, or 1-point improvement in 2 of 3 subdomains) did not show significant separation between active and placebo. However, using larger change from baseline (CFB) as the responder definition demonstrated nearly 2x greater number of responders for those receiving L1-79 vs placebo over a range of responder definitions (e.g., 5-to-15-point CFB in the VSSS). L1-79 was well tolerated with no serious adverse events or adverse events leading to withdrawal.

Conclusions:

L1-79 demonstrated statistically significant and clinically meaningful improvements in socialization as measured by the VSSS and socialization focused clinician and parent rating scales. A larger magnitude of response was seen in individuals with greater social impairment present at baseline, higher IQ and younger age. response rates for active treatment were consistent over a wide range of responder definitions. Larger trials are warranted to explore the efficacy of this agent for socialization in ASD.

**Oral Session -****328 - Mechanisms and Therapeutic Development in Genetic Neurodevelopmental Disorders**

May 2nd, 2025, 5:30 PM - 6:30 PM - 4C-1,2

Moderator: Suma Jacob, UCLA, Los Angeles, CA

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328.001 Developing a Targeted Genetic Therapy for SYNGAP1-Related Intellectual Disabilities

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Background: *SYNGAP1* is a critical gene for neuronal development, synaptic structure, and neuronal function. Loss at the synapse leads to aberrant neuronal communication. In addition to the dysregulation of synaptic signaling, loss of SynGAP1 also results in dysregulated Ras GTPase cellular signaling and RAS/MAPK pathway disruption. Clinically, this dual dysregulation of inter- and intracellular communication results in debilitating and severe consequences. Mutations in SynGAP1 cause a severe neurodevelopmental disorder (NDD), characterized by global developmental delay, intellectual disabilities (ID), hypotonia and motor impairments, ASD, and recurring seizures that result in developmental epileptic encephalopathy (DEE). Although SynGAP1-related ID (SRID) is a rare disorder, it is one of the most common IDs, accounting for ~1-2% of IDs, with genetic etiology. Currently, there are no therapies or treatments targeted for SRID, marking a critical unmet medical need.

Objectives: To restore lifelong restoration of SYNGAP1 gene and protein expression by leveraging the endogenous allele by targeted gene regulation, capturing all isoforms and post-transcriptional modifications.

Methods: We have developed a novel modular CRISPR activation system for gene regulation. Preliminary data generated a lead guide therapeutic construct that increased SYNGAP1 mRNA and SynGAP1 protein expression using patient-derived iPSCs. An initial panel of 15-30 sgRNAs were designed using the CHOPCHOP online algorithm and are screened via transient transfections in human iPSC cells to evaluate gene activation. All experiments are performed with an unguided dCas9 (NG) and a dCas9-No Effector, to serve as negative controls. Each experiment is performed in biological triplicate (independently reproduced at least 3 times), as per prior studies. Demonstration of therapeutic lead efficacy is measured by RT-qPCR adhering to the MIQE guidelines (dMIQE), and Western blots and/or human SYNGAP1 Elisa kits (commercially available), validated by our group. Functional efficacy will be determined by high density microelectrode array recordings (HD-MEA), using 2D and 3D models of patient derived iPSCs, and primary neurons from the humanized Prosser mouse model. In vivo translational rescue was performed by behavioral and neurophysiological assays previously published by the Silverman laboratory.

Results: Previously, we have also reported behavioral impairments, resulting from the loss of *Syngap1*^{-/-}, and impairments in the translational biomarkers of sleep, power spectral density bands using EEG, local network bursting anomalies and hyperexcitability, recently published in Fenton et al. (2024), bridging neuronal network firing patterns *in vitro* to neurophysiological phenotypes *in vivo*. We crossed the humanized backbone Prosser *SYNGAP1* mouse with the Hugarir *Syngap1*^{-/-} mutant mouse to discover that mutant phenotypes and effect size, remained fully intact. We have started assessing therapeutic efficacy in primary neurons from the humanized mouse and iPSCs, along with optimizing translational neurophysiological outcomes for *in vivo* reversal.

Conclusions: We will employed a battery of behavioral, seizure and neurophysiological assays, to inform us, if functional reversal of Syngap1 by AAV-CRISPRa therapeutic is feasible. Upon completion, this work would advance a targeted therapeutic for SRID while also advancing translational science for precision therapeutics for individuals with genetic NDDs.

328.002 Defining Mechanisms of TBR1 Syndrome Using Diverse Allelic Variants

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Background: Heterozygous *de novo* variants in *TBR1* cause a rare form of autism called TBR1 Syndrome, which involves intellectual disability, behavioral challenges, and speech and motor impairments. *TBR1* encodes a neuronally expressed transcription factor (TF) considered a “master regulator” of autism risk gene expression in the developing cortex. The types and genomic locations of patient-associated *TBR1* variants predict at least three major functional subclasses: (1) **early-truncating variants** leading to *TBR1* haploinsufficiency, (2) **missense variants** impacting the T-box DNA-binding domain, and (3) **late-truncating variants** impacting the T-box TF-associated domain, the function of which is unknown. Late-truncating variants, including a highly recurrent frameshift variant p.T532Rfs*144, are associated with more severe clinical phenotypes than other *TBR1* variants. Across all variant subclasses, *TBR1* heterozygosity leads to reduction of the anterior commissure (AC), an axon tract linking ventral cortical areas between brain hemispheres. *Tbr1* haploinsufficient mice show altered autism-related behaviors and reduction of the AC, but the phenotypes and underlying mechanisms associated with missense and late-truncating variants have not been fully characterized.

Objectives: We sought to identify the molecular and cellular mechanisms by which *TBR1* variant subclasses contribute to shared autism risk as well as phenotypic heterogeneity in TBR1 Syndrome.

Methods: Using CRISPR-Cas9, we generated an allelic series of *Tbr1* mutant mice representing three predicted *TBR1* variant subclasses. We used biochemical, histological, genomic, and behavioral assays to assess the impacts of variant subclasses on TBR1 levels, brain morphology, gene regulation, and social and motor phenotypes. CRISPR-generated *Tbr1* mutants were also compared to previously generated *Tbr1*-null alleles.

Results: We found that in early postnatal cortex, early-truncating variants led to decreased TBR1 protein, the missense variant p.K228E led to increased TBR1, and late-truncating frameshift variants led to increased or decreased TBR1 depending on the open reading frame generated. We observed dissimilar cortical phenotypes among homozygotes of each variant, suggesting varying degrees of *Tbr1* functionality across variant subclasses. However, we observed similar AC phenotypes across heterozygotes, suggesting sensitivity of this brain structure to *Tbr1* perturbation. Across early-truncating, missense, and *Tbr1*-null variants, we identified convergent dysregulation of extracellular matrix, neurotrophin, and Wnt signaling-related transcripts in embryonic *Tbr1* heterozygous cortex. We also identified altered social interaction and increased open field activity in early-truncating and missense *Tbr1* mutants. Ongoing experiments will further examine gene regulation and behavioral phenotypes in *Tbr1* mutant mice, including late-truncating frameshifts.

Conclusions: Using CRISPR-generated mouse models with patient-associated *Tbr1* variants, we provide evidence for variant subclass-specific effects on TBR1 protein levels in the developing brain. These variants show functional differences at homozygosity but converge to impact axon tract development and autism-related behaviors at heterozygosity, indicating face validity for TBR1 Syndrome. Future studies will harness this allelic series to elucidate molecular interaction networks altered in broader autism and evaluate potential therapeutic approaches for alleviating autism symptoms.

328.003 A Single Patient Trial of Fluoxetine in KCNC1-Related Disorder

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Background: With advances in genetic testing, a growing number of children with neurodevelopmental disabilities are being diagnosed with rare genetic conditions. Research evidence to guide care in these rare genetic neurodevelopmental conditions is lacking, yet large scale clinical trials are unfeasible due to small sample sizes. KCNC1 related disorder, for example, is an ultra-rare neurologic and developmental disorder caused by a genetic variant in the gene coding for a potassium channel subunit (Kv3.1). Potassium channels are important to regulating neuronal firing and resting membrane potentials; KCNC1 related disorder is associated with developmental delays and seizures. A 2023 case report described a child with epilepsy and a missense variant in KCNC1 resulting in a gain of function effect on the Kv3 channel and hyperpolarization of the resting membrane. Fluoxetine has been shown to have inhibitory effects on the Kv3.1 subunit in vitro. In vitro cellular kinetics were improved with fluoxetine treatment, and clinical treatment with fluoxetine was noted to improve the child's motor delays (1).

Objectives: The primary objective of this study was to objectively evaluate the safety and effectiveness of fluoxetine to treat motor delays in a child with KCNC1 related disorder and a gain of function variant.

Methods: Whole-cell voltage clamp electrophysiological studies confirmed a hyperpolarizing/ gain of function effect (2). Using a randomized, double-blind (within subject) multiple baseline ABA-phase design clinical trial, the effects of fluoxetine in a single preschool aged child with KCNC1 related disorder were examined over 40 weeks. Here, the participant started on placebo (A), and then the active treatment start (B) and stop (A) moments, as well as dose transition moments, were blinded and randomized. The primary outcome was motor development as measured by weekly parent report on the Early Motor Questionnaire, as well as safety as measured by adverse event reporting and the Clinical Global Impression Scale. Clinical biomarkers were collected in parallel, including electroencephalography, electroretinography, and optical coherence tomography.

Results: Full trial results are expected December 2024 and will be presented. This session will also a) present design elements and methodological considerations related to single subject trials in ultra rare conditions broadly, b) discuss considerations for co-designing a study with a single participant family, and c) review complexities related to regulated single subject trials in rare paediatric conditions.

Conclusions: Accessible opportunities for individualized clinical research in rare genetic conditions will be essential for building treatment evidence to guide care. This work is very much in line with the goal of personalized care for autistic individuals and their families, many of whom have been diagnosed with rare and/or genetic conditions.

References

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328.004 Using Mouse Models to Help Subgroup Participants for Clinical Trials

J. Ellegood¹, A. Beauchamp², J. P. Lerch² and E. Anagnostou¹, (1)Bloorview Research Institute, Holland Bloorview Kids Rehabilitation Hospital, Toronto, ON, Canada, (2)Mouse Imaging Centre, The Hospital for Sick Children, Toronto, ON, Canada, (3)Wellcome Centre for Integrative Neuroimaging, University of Oxford, Oxford, ON, United Kingdom

Background: The heterogeneity of Autism and other Neurodevelopmental Conditions (NDCs) makes it difficult to understand the underlying biology and hinders the ability to run a successful clinical trial. It is likely that there are distinct clusters or subgroups within the clinical population that would lead to a more successful trial, but how one identifies these subgroups is debatable. One promising approach is to use structural MRI. However, in human participants, neuroanatomical clustering provides limited information into the molecular basis in identified clusters.

Objectives: Use cross-species analytics to provide molecular signatures to human subgroups to streamline treatment and aid in clinical trial outcomes.

Methods: Four data sets were used: 1. T1w MRI scans from 700+ individuals in the POND Network, 2. T2w MRI scans from 4000+ mice across 135 different genetic mouse lines related to NDCs, 3. T1w MRI scans from 1000+ individuals from the Healthy Brain Network (HBN), as a replication cohort, and 4. Mouse and human gene expression data from the Allen Institute.

Creating neuroanatomical clusters – The MRI scans were registered together separately for each species. Using absolute and relative volume information, we computed effect size maps with respect to controls. We then used similarity network fusion (Wang et al., 2014) and spectral clustering to identify neuroanatomical clusters in the mouse and two human datasets.

Linking clusters across species – We evaluated the similarity across species using a gene expression common space (Beauchamp et al. 2022). We created a gene expression signature for every cluster by averaging the expression of 2835 homologous genes over all voxels and correlated the expression signatures between mouse and human clusters.

Annotating biological pathways – For the mouse clusters, we expanded our cluster gene sets into gene neighbourhoods by using the STRING database (<https://string-db.org>) to identify one-hop protein-protein interactions. We used the Reactome database (<https://reactome.org/>) in combination with gene annotations from the Bader Lab (<https://baderlab.org>) to evaluate the over-representation of molecular pathways in each cluster.

Results: The optimal human and mouse cluster solutions, derived based on the distributions of the spectral clustering eigengap metric, indicate a 2-cluster solution for the human participants from the POND cohort, a 3-cluster solution for the human participants from the HBN cohort and a 4-cluster solution for the mouse. There were two 3-way matches at the optimal solutions (Figure 1). This demonstrates that the clusters identified are not specific to one cohort, instead they capture robust patterns of neuroanatomical organization among individuals with NDCs. This work lays the framework for participant selection in clinical trials and individualized treatment as a gene list of interest can be used to measure enrichment cross species. Additionally, neuroanatomical differences alone in an individual can help to sub-categorize them and streamline treatment.

Conclusions: The heterogeneity of Autism and NDCs suggest that the current diagnostic classification does not reflect a unique biological category. The identification of sub-groups with convergent biology is crucial for the development of effective therapies. The novel data-driven methods for linking brains across species provides a promising avenue towards this goal.



Poster Session

417 - Animal Models I

May 2nd, 2025, 12:30 PM - 1:30 PM - Hall 4A

417.001 Age-Dependent Effects of PI3K Inhibition on Autism-Relevant Neurodevelopmental Phenotypes in a Model of PTEN Haploinsufficiency

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Background: Dysregulation of the PI3K-Akt-mTOR signaling pathway, essential for regulating cell growth, survival, and protein synthesis, has been linked to macrocephaly and autism spectrum disorder (ASD). *PTEN* encodes a phosphatase that negatively regulates phosphoinositide-3-kinase (PI3K). In individuals with ASD and macrocephaly, *PTEN* loss-of-function mutations are present in 10–20% of cases. Despite this, the contributions of PI3K activity to neurodevelopmental phenotypes in *PTEN*-ASD remain poorly understood.

Objectives: This study aims to determine whether pharmacological inhibition of PI3K can rescue ASD-relevant phenotypes in a model of *Pten* haploinsufficiency and to identify critical periods for effective intervention.

Methods: Juvenile (postnatal days 4–14) and adult (postnatal days 30–50) *Pten* haploinsufficient (*Pten*^{+/−}) and control mice received daily doses of the brain-penetrant PI3K inhibitor GDC-0084. Neuroanatomical assessments included measurements of brain mass, cortical layer V neuron size, and corpus callosum thickness at the midline.

Results: Consistent with previous findings, both juvenile and adult *Pten*^{+/−} mice exhibited heavier brains, larger cortical layer V neurons, and thicker corpus callosum compared to controls. Following GDC-0084 treatment, no change in brain mass was observed in either age group. In juveniles, drug-treated *Pten*^{+/−} mice showed a significant decrease in the size of layer V cortical neurons, with no change in corpus callosum thickness. In contrast, in adults, we observed a partial rescue of corpus callosum thickness in drug-treated *Pten*^{+/−} mice while layer V cortical hypertrophy remained unchanged.

Conclusions: These findings suggest age-dependent differential effects of PI3K inhibition. In juveniles, the rescue of cortical layer V hypertrophy—but not brain overgrowth or white matter abnormalities—may indicate that PI3K/mTOR-independent mechanisms underlie these phenotypes. In adults, the rescue of corpus callosum overgrowth could suggest a drug effect that impacts glial cell populations. Ongoing experiments are exploring the role of glial cells in mediating these effects, ultimately aiming to diversify potential therapeutic targets for individuals with *PTEN*-ASD. This study addresses a critical gap in understanding the contributions of PI3K activity to neurodevelopmental phenotypes in *PTEN*-ASD models and highlights the importance of identifying age-dependent critical periods of PI3K inhibition in developing targeted therapies.

417.002 Atypical Behaviours in the Offspring of Vitamin D Insufficient Female RATS Replicate Autism Spectrum Disorder Phenotype

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Background: In recent years, significant attention has been given to the importance of maternal nutrition in influencing behavioral outcomes in offspring, particularly concerning neurodevelopmental disorders. Among various nutrients, Vitamin D is a crucial factor affecting neurodevelopment during critical prenatal periods. Insufficient Vitamin D levels in expectant mothers can hinder neural development and potentially lead to behavioral abnormalities associated with autism spectrum disorder (ASD). Research suggests low levels of Vitamin D are associated with a higher risk of psychiatric disorders, including ASD. Therefore, it is essential to use animal models to study the effects of Vitamin D deficiency during development to understand whether maternal Vitamin D deficiency is a risk factor for ASD and to clarify the mechanisms through which such deficiency may contribute to neurodevelopmental deficits. Studies in animals have demonstrated maternal Vitamin D deficiency can result in social deficits, repetitive behaviors, and impaired communication in offspring, which aligns with the diagnostic criteria for ASD. Due to the complex nature of ASD, exploration of the relationship between Vitamin D insufficiency and its associated risks is warranted.

Objectives: Investigation of the impact of maternal vitamin D insufficiency on the vitamin D status, early developmental trajectories, and autism spectrum disorder (ASD)-related behavioral characteristics of offspring.

Methods: Female Sprague Dawley rats, one month old, were fed vitamin D-deficient rodent diet (AIN-93G) and exposed to incandescent lighting for a period of six weeks and were kept on this diet until weaning. Vitamin D level was tested using ELISA technique. Pups were monitored at specific postnatal days (P5, P8, and P17) for parameters such as body weight, nose-tail length, righting reflex, and negative geotaxis. Behavioral experiments were conducted on P30, including marble burying, infrared actimeter, social play assessments, three-chambered sociability, and elevated plus maze tests.

Results: Pups of female rats fed on vitamin D-depleted AIN 93G diet exhibited a vitamin D insufficiency of 55.5% compared to pups from control diet. The offspring demonstrated significantly reduced body weight and diminished nose-to-tail length compared to controls. Additionally, they exhibited significantly longer negative geotaxis response time on P17 compared to controls. The DVD group buried significantly fewer marbles, and mainly stayed along the arena's boundaries. In contrast, control group dug, played, and explored the entire platform. In IR actimeter experiment, DVD rats exhibited significantly lower global activity, fewer rearing episodes, and lesser distance traveled than the controls. In the Plus Maze test, DVD rats spent more time in closed arms, though they made fewer entries into the closed arms than the controls and their movements in closed arms appeared more stereotyped. In the 3-chambered test and social play analysis, the DVD rats spent significantly more time exploring novel rat chamber and showed more pouncing and wrestling activities with the novel rat than the control group.

Conclusions: Atypical behaviors observed in the offspring of Vitamin D-insufficient female rats parallel established ASD phenotypes in children. By examining these behaviors through neurobiological and environmental interactions, we will elucidate the mechanisms by which maternal Vitamin D deficiency predispose offspring to ASD.

417.003 Chd8-Dependent Molecular and Functional Vulnerabilities in the Developed Cerebellum

E. M. Merino¹, S. J. Jung¹, N. Seban², K. Cichewicz², M. R. Mbah¹, D. Rivera¹, C. Bazan¹, E. G. Antzoulatos¹, C. P. Canales³, A. S. Nord³ and D. Fioravante⁴, (1)University of California Davis, Davis, CA, (2)UC Davis Center for Neuroscience, Davis, CA, (3)Department of Psychiatry and Behavioral Sciences, UC Davis Center for Neuroscience, Davis, CA, (4)Neurobiology, Physiology and Behavior Center for Neuroscience, UC Davis Center for Neuroscience, Davis, CA

Background: Even though the cerebellum has been consistently and causally associated with autism spectrum disorders (ASD), cerebellar contributions to ASD-relevant pathology remain understudied compared to forebrain regions. The chromatin remodeler *CHD8* represents a model for rare monogenic neurodevelopmental disorders with a core set of symptoms associated with ASD. *CHD8* is highly expressed throughout the brain early in development and remains elevated in the adult cerebellum but not adult forebrain. This raises the previously unexplored hypothesis that *CHD8* may continue to contribute to cerebellar function and ASD pathology in the adult.

Objectives: Define the impact of *Chd8* ablation on adult cerebellar function across genomic, electrophysiological and behavioral dimensions.

Methods: We applied genomic, electrophysiological and behavioral assays to examine deficits in adult cerebellar physiology and function. We analyzed differential gene expression via RNA sequencing from *Chd8* heterozygous mutants and wild-type littermates. Using the same model system, we examined electrophysiological signatures of cerebellar output neurons in vivo. Finally, using conditional genetic manipulations of *Chd8* that were spatially and temporally restricted to the adult cerebellum, we investigated impacts on motor performance and learning, affective state, regulation of learned fear and social behaviors.

Results: We identified differentially-expressed genes (DEGs) that indicated perturbation to metabolic and synaptic pathways, with gene targets that bore relevance to cellular electrophysiological properties. We detected disrupted neural activity profiles in the deep cerebellar nuclei consistent with neural hyperexcitability and elevated cerebellar output. Finally, we uncovered behavioral deficits specifically in motor learning and preference for social novelty.

Conclusions: Our findings point to novel *Chd8*-dependent molecular and functional vulnerabilities in the adult cerebellum with relevance to ASD. Ongoing work will resolve specific cell types and molecular cascades in identified neural circuits that drive neuropathology and motor and social deficits. By pinpointing biological processes and circuits that remain vulnerable to *Chd8* ablation in the developed cerebellum, this line of research has the potential to identify novel therapeutic targets over a time-extended treatment window.

417.004 Differential Expression of Synaptic Genes in the Amygdala: Comparing Autism Spectrum Disorder and Nonhuman Primate Models of Maternal Immune Activation

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Background:

Children prenatally exposed to maternal infection have an increased risk of neurodevelopmental disorders, such as autism spectrum disorder (ASD) and schizophrenia. Preclinical models of maternal immune activation (MIA) suggest the maternal immune response can lead to long-term changes in brain development and behavior in offspring. Alterations in socioemotional development have emerged as a common feature of MIA-exposed offspring, which implicate disruptions to core functions of the amygdala. Identifying cell-specific transcriptional changes in amygdala may serve as a crucial translational bridge for understanding the association between MIA and the risk of neurodevelopmental disorders.

We previously conducted single-nucleus RNA sequencing (snRNA-seq) on amygdala brain tissue obtained from MIA-exposed nonhuman primate offspring at 4 years of age and identified dysregulated genes linked to synaptic structure and function, with significant overlap among genes associated with ASD. We intend to explore the relationship between amygdala synaptic gene dysregulation in MIA-exposed offspring and human neurodevelopmental disorders.

Objectives:

We use a multi-tiered approach aimed to: (1) perform overrepresentation analysis with disorder-related gene databases to investigate MIA-related transcriptional changes, (2) measure gene expression changes of synaptic genes in the amygdala of individuals with ASD, (3) compare gene expression patterns between MIA-exposed nonhuman primates and individuals with ASD within amygdala, and (4) map synaptic gene expression in the amygdala across human and nonhuman primate models.

Methods:

First, we performed an overrepresentation analysis of nonhuman primate MIA amygdala (lateral nucleus) snRNA-seq data and compared differentially expressed genes with risk genes for autism, anxiety, schizophrenia, and other disorders to determine overlap with the MIA model. Next we measured the expression levels of targeted synapse-related transcripts in postmortem ASD and control amygdala using the QuantiGene Plex Assay kit. We then used RNAscope HiPlex on human and non-human primate amygdala tissue sections to map synapse-related transcripts in identified cell types.

Results:

Overrepresentation analysis of differentially expressed genes in the amygdala of MIA-exposed nonhuman primates revealed significant overlap with ASD and schizophrenia related gene databases but not in other datasets linked to anxiety or non-psychiatric disorders. In human ASD amygdala, the expression of genes associated with synaptic function (*GRIN2B*, *GRIA2*, *NRXN1*, *SHANK2*, *GRIA3*, *SYN1*, *HOMER1*, *SHANK3*, *SYNGAP1*, *SHANK1*) was significantly upregulated. However, synaptic genes in MIA neuron subclusters were largely downregulated for many of these same transcripts.

Conclusions:

Our study found significant changes in synaptic gene regulation in both human ASD and MIA-exposed nonhuman primate amygdala. MIA exposure led to the downregulation of many accepted ASD risk genes, while human ASD samples showed upregulation of the same genes. Both patterns of differential gene expression point to synaptic dysregulation, which can impact neurodevelopment and daily neural functions. Transcriptional changes in MIA were largely in excitatory neuron clusters and could therefore upset the balance of excitatory/inhibitory synaptic tone, a critical factor for normal development and function. In amygdala, these changes could influence key social and emotional behaviors seen in ASD. Knowledge of the molecular and cellular changes associated with neurodevelopmental disorders such as ASD enables us to better focus future research on their underlying mechanisms.

417.005 Dissecting KMT5B's Role in Motor Function Using Conditional Knockout Mice

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Background: Germline heterozygous disruptive variants in lysine methyl transferase 5B (KMT5B/SUV420H1) have been linked to a syndrome characterized by developmental delays, intellectual disability, autism spectrum disorder, and a high rate of motor deficiencies in humans. Using a mouse model of this condition, we have previously reported early motor reflex deficits, decreased hindlimb skeletal muscle weights, decreased neuromuscular strength, and increased neuromuscular junction fragmentation in the germline *Kmt5b* heterozygous (HET) state compared to wild-type (WT) littermates. Paradoxically, these phenotypes were underscored at the histopathological level by increased numbers of fast-twitch myofibers that were significantly smaller in size in HET compared to WT muscles. The source of these motor phenotypes is currently unknown.

Objectives: To utilize conditional mouse genetic knockout models to better understand whether KMT5B-linked motor phenotypes are driven by KMT5B-specific regulation of skeletal muscle and/or motor neuron function.

Methods: Floxed *Kmt5b* mice were crossed to a B6.129S1-*Mnx1^{mt(cre)Tmj/J}* line expressing cre-recombinase driven by the *Mnx1* promoter for motor neuron-specific *Kmt5b* knockout ("mn") and a B6.Cg-Tg(*ACTA1-cre*)79Jme/J line expressing cre-recombinase driven by the *ACTA1* promoter for skeletal muscle-specific *Kmt5b* knockout ("sm"). From both lines, conditional WT, HET, and knockout (KO) progeny were subjected to a small battery of early motor reflex and strength testing. Mice were then sacrificed, hindlimb soleus (SOL) and extensor digitorum longus (EDL) muscles were weighed, and additional molecular experiments were performed. Independent cohorts of male and female mice were tested in all experiments. Groups were compared using a 2-way ANOVA (variables of genotype and sex) or repeated measures ANOVA with post hoc testing (Šidák's test or similar).

Results: Knockout of *Kmt5b* contained to skeletal muscles/sm or motor neurons/mn was postnatally viable (Chi-square test not significant), in contrast to germline *Kmt5b* KO. While early motor reflexes (surface righting and grasping strength) were not changed in mn mice, surface righting time was significantly slower in smHET compared to smWT female mice ($p=0.0248$; Šidák's test). Weekly measures of strength collected from postnatal day (P) 17-59 showed a significant interaction between age and genotype ($F_{(6, 177)}=2.681$; $p=0.0163$) driven primarily by females in the mn model. While strength was also reduced in smHET and smKO mice, this was not statistically significant. Skeletal muscle weights (SOL and EDL) collected from adolescent (P17) and young adult (P59) mice showed no significant differences in the sm model as well as no change in total body weights over time. Interestingly, there was a significant effect of genotype ($F_{(2, 56)}=15.26$; $p<0.0001$) on P59 EDL weight driven by large increases in mnHET males and females. MnHET animals also had higher body weights than their mnWT littermates which reached statistical significance in males ($F_{(2, 59)}=3.955$; $p=0.0244$).

Conclusions: Our data suggest that the increased myofiber counts reported in the germline *Kmt5b* model could be due to specific KMT5B effects on motor neuron function rather than skeletal muscle development. Further, our data suggest that the full spectrum of motor deficits identified in germline *Kmt5b* mice are likely due to impacts on multiple systems.

417.006 Loss of m6A mRNA Readers in Zebrafish Model Impacts Head Size Phenotypes Implicated in AutismG. N. La¹, N. K. Haghighi¹ and M. Y. Dennis², (1)Biochemistry and Molecular Medicine, University of California, Davis, Davis, CA, (2)Biochemistry & Molecular Medicine, MIND Institute, Genome Center, University of California Davis, Davis, CA

Background: Autism (ASD) is a complex neurodevelopmental condition encompassing a diverse range of phenotypes. ASD is highly heterogeneous in both phenotypic presentation and genetic predisposition, leaving much to be uncovered regarding its genetic etiology. Focusing on disproportionate megalencephaly (DM), a subphenotype of ASD where individuals have an enlarged brain disproportionate to their height, we identified two probands harboring cases of *de novo* mutations in two m⁶A-mRNA reader genes with no prior association with ASD — a duplication of *YTHDF2* and a loss of function mutation in *YTHDC1*, respectively. Within the m⁶A mRNA pathway, readers are proteins that bind and interact with m⁶A-modified transcripts in the nucleus and cytoplasm, dictating the balance and timely export, translation, stabilization, and degradation of their target transcripts. For example, YTHDF2 promotes degradation of m⁶A-mRNAs in the cytoplasm, while YTHDC1 resides in the nucleus, facilitating alternative splicing, polyadenylation, and nuclear export. Our preliminary data using zebrafish show that knocking out *ythdf2* yielded smaller brain area (Wilcoxon T-test p-value <0.01 , $n=42$) and overexpression via injected in vitro transcribed mRNAs resulted in larger brain area (Wilcoxon T-test p-value of 0.0013, $n=56$), recapitulating patient phenotypes.

Objectives: Following these results, we aimed to look towards other m⁶A mRNA reader genes including *ythdc1*, *ythdc2*, *ythdf1*, and *ythdf3*, to see how loss of function may also impact head and brain size phenotypes in our zebrafish model. Like YTHDF2, we believe additional m⁶A-mRNA readers may play a role in dictating the fate of m⁶A-modified transcripts relevant to neurogenesis.

Methods: Zebrafish knockouts (KOs) were facilitated by injecting CRISPR SpCas9 and a mix of guide RNAs (gRNAs), targeting the gene of interest, at the single-cell stage. KOs were compared to scrambled gRNA-injected controls. At 3 days post fertilization, high throughput imaging and morphometric screening was performed on zebrafish larvae, as seen in Figure 1A. Measurements, such as distance between the eyes and telencephalon serve as proxies for head size and may be indicative of brain size. Current use of lightsheet microscopy and analysis of brain area in transgenic larvae expressing GFP as a broad neuronal marker, aim to validate these findings.

Results: Upon knocking out these genes, we see significantly smaller head sizes in *ythdc1* KOs, showing decreased distance between the eyes, and significantly larger head sizes in *ythdf3* KOs, demonstrated by increased telencephalon and distance between the eyes, at 3 days post fertilization (refer to Figure 1B). Additionally, we see potential developmental delay among *ythdc1*, *ythdf1*, and *ythdf3* knockouts, indicated by reductions in body length compared to control. Relevant to ASD-DM, *ythdf3* KOs exhibit disproportionately larger head sizes, despite being smaller compared to controls.

Conclusions: Altered m⁶A mRNA modifications and expression of readers have been found to impact early neurodevelopment. Our work expands our mechanistic understanding of m⁶A-mRNA readers in the context of ASD etiology, potentially connecting m⁶A mRNA modifications as a contributor to this complex condition.

**417.007** MOUSE-Decc: Maximizing Outcomes Using Smart Engine for Diverse Experimental Collaborative Cross in Autism ResearchZ. Shakkour¹, P. Carney² and C. R. Shyu³, (1)MU Institute for Data Science and Informatics, University of Missouri, Columbia, MO, (2)Neurology, University of Missouri, Columbia, MO, (3)Institute for Data Science and Informatics, University of Missouri - Columbia, Columbia, MO

Background: Collaborative Cross (CC) mouse lines are a valuable platform for preclinical research, capturing the genetic diversity of human populations. Derived from eight founder strains, these lines represent approximately 90% of the common genetic variation in *Mus musculus*, encompassing over 40 million SNPs and a diverse array of haplotypes. This extensive genetic diversity provides a broader phenotypic spectrum, which is particularly critical for autism research due to the complex interplay of genetic and environmental factors influencing autism spectrum disorders (ASD).

Objectives: The study aims to address the challenges researchers face in selecting CC strains for autism research, focusing on improving the strain selection process to facilitate the investigation of genes, pathways, and phenotypes associated with ASD.

Methods: MOUSE-DECC (Maximizing Outcomes Using Smart Engine for Diverse Experimental Collaborative Cross) utilizes a systematic, data-driven approach to optimize strain selection. By integrating comprehensive genotype-phenotype data, the platform identifies strains with genetic susceptibility or resilience to ASD-related traits and links optimized strain selection to relevant behavioral assays, such as social interaction and repetitive behavior assessments.

Results: MOUSE-DECC enhances research efficiency by allowing for more accurate predictions of strain-specific behavioral outcomes, minimizing the number of animals required for testing. The streamlined selection process is expected to save resources, reduce costs, and decrease the overall number of mice needed for experiments.

Conclusions: By facilitating a more tailored and efficient approach to CC strain selection, MOUSE-DECC addresses the urgent need for preclinical models that reflect the multifactorial nature of ASD and other complex diseases, enabling targeted investigations into specific genetic variants and their impacts on treatment responses.

417.008 Motor and Cognitive Behavior of Young and Aged FMR1 Knockout Rats

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Background: Autism spectrum disorder (ASD) is a neurodevelopmental disorder characterized by difficulties in social interaction and communication, and repeated or restricted behaviors and interests. Fragile X syndrome (FXS) is a leading single-gene cause of ASD as well as the most common cause of intellectual disability. It is caused by loss of the protein FMRP due to expansions in the *FMR1* gene, leading to hyperconnectivity and hyperexcitability. This causes motor deficits and cognitive impairment. Carriers of the *FMR1* premutation also develop these deficits as they age.

Objectives: This study uses an *FMR1* knockout rodent model to examine motor and cognitive behaviors in young and old age.

Methods: Wildtype, homozygous, and heterozygous *FMR1* knockout Long-Evans rats (at least 12 per group) were used in this study. These animals underwent the novel object recognition test, rotarod test, and grip strength test at postnatal day (P) 50-75 and after reaching 12 months. All animals were given 2 trials in the rotarod test, with an intertrial interval of 10 minutes. The grip strength test was carried out over three days with one trial given per day. The novel object recognition test was also carried out over three days. The animals were allowed to habituate to the empty arena for 5 minutes on the first day. On the second day, two identical objects were given, and the animals were allowed to explore for 10 minutes. On the final day, one object was replaced with a new object, and the animals were allowed to explore for 10 minutes. All tests were carried out by blind-to-condition researchers. Data were analyzed using linear mixed effects models.

Results: In the rotarod test, the latency to fall did not vary significantly by genotype. However, the latency was greater in both trials in old age than young age ($p < .001$ for both trials). Furthermore, all animals stayed on the rod significantly longer during trial 2 than trial 1 when they were old ($p = .001$) but not when they were young, suggesting possible acquisition of repetitive motor behavior as they age. In the grip strength test, the relative strength (grip strength/weight) was measured and found to be greater in old age than young age, irrespective of genotype ($p < .001$).

Wildtype animals had lower relative strength than the knockout animals, but this difference was not statistically significant. Homozygous knockout animals had a lower novel object discrimination ratio than heterozygous knockout or wildtype animals in young age, but this did not reach statistical significance. In this age group, there was a trend of homozygous knockouts showing less rearing behavior than the heterozygous knockout ($p = .067$). The novel object test data for old animals have been collected and analysis is in progress.

Conclusions: They *FMR1* knockout animals develop repetitive motor behavior as they age, but do not show impairment in grip strength. These animals also do not show memory impairment early in their lifespan.

417.009 Ondansetron Treatment Attenuates the Effects on Prenatal Stress on Repetitive Motor Behaviors and Pro-Inflammatory Cytokines in Adolescent Male Fmr1 Knockout Mice

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Background: Fragile X Syndrome (FXS) is an intellectual disability syndrome, in which one-third of affected individuals exhibit autistic features. FXS is caused by transcriptional silencing of *FMRI*, a gene encoding an RNA-binding protein. FXS individuals with autism spectrum disorder (ASD) exhibit heterogeneity in symptoms. There is increasing support that ASD arises from a complex interaction of environmental and genetic risk factors, including for monogenic syndromes, i.e. FXS. Past studies indicate that maternal stress during pregnancy may increase risk for ASD by glial reactivity producing neuroinflammatory responses in offspring. Past findings suggest that 5-HT₃ receptor antagonist treatment reduces glial reactivity and elevated central cytokine release. Thus, treatment with a 5-HT₃ receptor antagonist treatment may be effective in attenuating the effects of prenatal stress on ASD risk.

Objectives: The present experiment investigated whether the 5-HT₃ receptor antagonist, ondansetron attenuated the effects of prenatal stress on repetitive motor behaviors and brain inflammatory responses in male *Fmr1* knockout (KO) and wildtype mice.

Methods: Pregnant dams were exposed to two 30 minute restraint stress sessions during gestation days 10-16. At 4 weeks of age, offspring received a daily injection of ondansetron (1 mg/kg) or saline for seven consecutive days. One day after the last injection, mice received a nesting removal test (repetitive digging behavior) and zero maze test (anxiety-like behavior). After behavioral testing, mice were sacrificed with frontal cortex and striatal tissue dissected out and used to prepare RNA, and real time qPCR used to quantify levels of relevant inflammatory markers including IL6 and TNF-alpha. At least 4 biological replicates were used per group, target mRNA levels were normalized to levels measured for 3 housekeeping genes (GAPDH, b-actin, a-tubulin).

Results: Prenatal stress elevated digging behavior in WT and *Fmr1* KO mice with a significantly greater effect in *Fmr1* KO mice. Preliminary findings indicate that subchronic treatment with ondansetron significantly attenuated the prenatal stress induced elevation in repetitive digging behavior in both WT and *Fmr1* KO mice. Prenatal stress had no effect on locomotor activity in the nesting removal test or anxiety-like behavior in the zero maze, nor did ondansetron treatment affect these measures. Prenatal stress elevated IL6 and TNF-alpha in the frontal cortex of both WT and *Fmr1* KO mice. Ondansetron attenuated this elevation in both WT and *Fmr1* KO mice.

Conclusions: These results suggest that prenatal stress may interact with genetic factors to increase risk for autism-like behaviors. Further, the effects of prenatal stress on autism-like behaviors is attenuated by a 5-HT₃ receptor antagonist possibly by producing an anti-inflammatory response in neural circuitry underlying repetitive behaviors.

417.010 Profiling Oral Microbiota to Elucidate Gut-Brain Axis Alteration in Autism Spectrum Disorder

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Background: Autism Spectrum Disorder (ASD) is a complex neurodevelopmental condition characterised by deficits in social communication, restricted interests, and repetitive behaviours. Despite the increasing global prevalence of ASD, its underlying mechanisms remain poorly understood, and no definitive biological markers have been identified. Diagnosis primarily relies on behavioural assessments, often leading to delayed intervention. While extensive research has been conducted on the gut microbiota's role in ASD, there is a significant lack of microbiota data, particularly within the Indian population.

Objectives:

This study aims to explore the potential contribution of oral microbiota to ASD through its impact on the gut-brain axis, a growing area of interest in ASD research. By profiling microbial differences in oral samples from individuals with ASD and neurotypical controls, the study seeks to identify microbial signatures that could serve as early, non-invasive diagnostic markers.

Methods:

A systematic literature review was conducted following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, identifying key bacterial species potentially associated with ASD. These species were evaluated and ranked based on their relevance, data quality, and prevalence across studies. To further validate these findings, saliva samples from ASD individuals and neurotypical controls (n=30) are being collected. These samples will also support future gene expression studies, aiming to confirm observed microbial differences in line with the literature.

Results:

Analysis revealed 20 bacterial species significantly more abundant in individuals diagnosed with ASD. The most prominent genera included *Clostridium*, *Bacteroides fragilis*, and *Prevotella*, underscoring the diversity of microbial communities associated with ASD. The findings reinforce the hypothesis that these species may influence neurodevelopment through the gut-brain axis. Of particular interest is the role of microbial metabolites in triggering neuroinflammatory responses and behavioral changes, offering new insights into ASD pathophysiology.

Conclusions:

This study establishes a potential link between oral microbiota and ASD, providing a foundation for developing microbiota-based diagnostic tools. Such tools could enable early, non-invasive detection of ASD, especially in regions with limited microbiota data, like India.

417.011 Targeting Pparalpha Ameliorates Social Behaviour and Restores the Endocannabinoid Signalling in the Rat Valproic Acid of Autism

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Background:

Autism spectrum disorder (ASD) is a neurodevelopmental condition defined by deficits in social interaction and communication, typically appearing in early childhood and leading to substantial impairments in the development of social skills. The endocannabinoid system (ECS) is critically involved in the maturation and regulation of social behaviors and has been linked to the underlying causes of ASD. Notably, the neuromodulator *N*-arachidonylethanolamine (anandamide, AEA), which is produced by *N*-acyl-phosphatidylethanolamine-phospholipase D (NAPE-PLD) and broken down by fatty acid amide hydrolase (FAAH), plays a key role in governing social and emotional behaviors, particularly in mediating social reward mechanisms. Additionally, the activity of the ECS is influenced by peroxisome proliferator-activated receptor alpha (PPAR α), which has been implicated in ASD pathophysiology based on various preclinical findings. For instance, prolonged pharmacological activation of PPAR α using the agonist fenofibrate (FBR) can restore social behaviors disrupted by prenatal exposure to valproic acid (VPA).

Objectives:

Building on this foundation, the current study explores the hypothesis that primary deficits in ASD may originate from early dysfunctions in the ECS, particularly in brain regions involved in processing social rewards, such as the medial prefrontal cortex (mPFC) and nucleus accumbens (NAc).

Methods:

We employed the VPA-induced rat model of ASD to trace the progression of the ASD phenotype and uncover potential dysfunctions in the ECS. Specifically, we examined the expression levels of CB1 receptors, FAAH, NAPE-PLD, and PPAR α in the mPFC and NAc during postnatal development (from postnatal day 7 to adulthood) using immunoblotting techniques. Additionally, the levels of the main endocannabinoids (eCBs), AEA and 2-arachidonoylglycerol (2-AG), as well as endocannabinoid-like mediators, were analyzed by ultra performance liquid chromatography coupled with mass spectrometry (UPLC/MS-MS) in brain samples. As our findings indicated region-specific alterations in the ECS of VPA-exposed rats, we further investigated whether fenofibrate (FBR) administration could restore ECS signaling in adult VPA-exposed rats.

Results:

VPA-exposed pups exhibited reduced social interactions at postnatal days 14 and 21, which correlated with a decrease in CB1 receptor expression and a trend towards increased FAAH levels, while NAPE-PLD levels remained unchanged. Additionally, transient elevations in PPAR α expression were observed at these same developmental stages (PND 14 and 21). In adult VPA-exposed rats, a significant imbalance was detected in the expression of the ECS enzymes, with elevated FAAH levels and reduced NAPE-PLD levels. The results obtained from UPLC-MS/MS showed significant alterations in several endocannabinoids which might be responsible for the social impairments exhibited by VPA-exposed rats. Notably, prolonged FBR administration to VPA exposed rats was able to rescue the social deficits and some of the alterations in the endocannabinoid system.

Conclusions:

The study indicates that developmental alterations in the ECS and the PPAR α pathway may play a role in the ASD-like phenotype observed in rats prenatally exposed to VPA. Moreover, pharmacologically targeting PPAR α with the agonist FBR improved social behavior and partially restored ECS signaling in this murine model, highlighting a promising potential therapeutic strategy for ASD.

417.012 The Effect of an Erythropoietin Derivative on Autism-Related Behaviors in Model Mice

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Background: Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder characterized by deficits in social communication and interaction, alongside restrictive and repetitive behaviors. ASD affects 1 in 36 children in the United States and is caused by both genetic and environmental factors. While therapy can be used to treat ASD, there are no known pharmacological treatments that rescue social deficits in ASD patients.

Erythropoietin (EPO) is an interesting candidate treatment for ASD due to its neurogenic, neurotrophic, and neuroplastic effects. However, EPO has not yet been examined for use in ASD patients, and there is limited existing work on preclinical animal models bearing out the effects of erythropoietin on autism-like phenotypes. Moreover, EPO has unfavorable hematopoietic effects at high doses, limiting its use to only those with anemia. Therefore, in order to gauge the potential of EPO as a potential treatment for autism, it is necessary to test non-hematopoietic derivatives.

Objectives: We examined whether QPO--a recombinant, non-hematopoietic derivative of erythropoietin that has been demonstrated to rescue depression-like behaviors in mice and enhance neurotrophic mechanisms in the brain--can rescue autism-related behavioral phenotypes in the BALB/c mouse model.

Methods: We evaluated the effects of QPO on BALB/c mice (BALB), an idiopathic mouse model of autism noted for its low sociability that has been used in prior erythropoietin derivative studies, as well as C57BL6/J mice as a control. Mice received intraperitoneal injections of QPO (50 μ g/kg) or vehicle every other day over a three-week period. In each of the four experimental groups (mouse strain $\pm$ treatment), there were ≥ 16 mice, evenly divided by sex. To avoid possible confounds of the estrous cycle on social behavior, all experiments took place prior to postnatal day 56. The mice were divided into QPO and vehicle groups, receiving 11 injections, every other day for 22 days. The three chamber social approach task with age-, sex-, and strain-matched stranger mice was used to assess sociability, and open field and elevated plus maze tasks were used to assess activity and anxiety. The forced swim task was used as a comparison to prior BALB/c studies.

Results: When we examined mixed-sex cohorts of mice, we found a significant improvement in sociability in the three-chamber task in BALB mice that had received QPO mice over their vehicle counterparts; no similar difference was seen in C57 mice. Notably, this effect was largely driven by improvement in the male mice, which spent more time interacting with the stranger mouse and less time interacting with the non-social object. We saw no improvement in open field or elevated plus behavior in either the mixed-sex cohort or in single-sex cohorts. We saw a significant decrease in immobility in the forced swim task in male, but not female mice.

Conclusions: Based on our findings, QPO has the potential to rescue autism-related behavioral traits and is emerging as a prospective treatment. Future work will examine the underlying mechanisms of these findings, and how broadly these findings apply across mouse models.

Poster Session**418 - Coexisting Medical, Neurodevelopmental, and Mental Health Conditions I**

May 2nd, 2025, 12:30 PM - 1:30 PM - Hall 4A

418.013 2000 Ideas for Suicide Prevention: Shared and Differing Priorities from Autistic People and Those Who Support Them.

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Background:

Across the world, suicide is a leading cause of death for autistic people without intellectual disabilities (Santomauro et al., 2024). Despite a 515% increase in autistic suicide research since 2018 (Brown et al., 2024), research addressing the *assessment* and *treatment* of suicidal thoughts and behaviour comprises a mere 10% of publications in that timeframe. While this demonstrates clear growth in our understanding of suicide in autistic people, our practical knowledge around *preventing* suicide remains severely underdeveloped. As a result, national suicide prevention strategies lack specific, concrete policies to reduce suicide in autistic people, who are unrecognised as a high-risk group in many countries.

Objectives:

Building on a previous, research-focused priority-setting exercise for autism and suicide (Cassidy et al., 2021), we aimed to first gather ideas from the autism community for policies and interventions aimed at preventing suicide (Phase 1, complete). Subsequently, we will identify the community's priorities for which ideas warrant further development (Phase 2, commencing November 2024; results ready for INSAR). Herein, we present our methods and findings from Phase 1.

Methods:

In Phase 1, we collected ideas via an online survey between January-July 2024. Participants were 1481 autistic people without intellectual disabilities (average age: 36.7 [SD: 15]), with experience of suicidal thoughts and behaviour; 52% were cisgender women (23% gender-divergent, 24% cisgender men). Participants also included 274 people who support autistic people (henceforth 'supporters'), 72% of whom were parents of autistic people who had experienced suicidal thoughts and behaviour (the autistic children of these parents were aged 7-49 [average 21 years, SD: 7]). Most participants (94%) were British. During the survey, they were asked to provide up to 3 ideas to prevent suicide in autistic people, which were analysed thematically by four researchers.

Results:

We analysed 1796 ideas from 1079 autistic participants, and 295 ideas from 190 supporters. Across a range of ideas varying in concreteness (some of which conveyed multiple essential points), we identified the most frequently occurring broad themes. While the same themes were identified in both groups, the relative frequency of their occurrence differed markedly (see Figure 1). Autistic people prioritised societal stigma/discrimination and expediting autism diagnoses more than supporters; supporters prioritised improving *existing* services and support above developing autism-specific services and support, while the latter was a higher priority for autistic people. Similarly, while autistic people prioritised peer support, supporters prioritised social support more broadly.

Within the 10 most frequent themes mentioned by autistic people, we identified 63 more specific, concrete ideas recurrent in both participant groups (Figure 2). These ideas will be ranked in Phase 2 by a larger pool of autistic people and supporters.

Conclusions:

While we await findings from the priority-setting exercise, Phase 1 highlights the need for societal and systemic change in response to suicide in the autistic community. Though ideas for suicide prevention policy and practice spanned multiple arenas from health- to social care, autistic people prioritised *autism-specific* and *peer* support, underscoring the need for co-production in steps towards suicide prevention.

**418.014** A New Approach to the Early Identification and Care of Children Experiencing Symptoms of Developmental Regression

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Background:

Developmental regression is the loss of previously established skill/s and is reported to occur in at least one third of children who are later diagnosed with autism. Early identification, and access to interventions improves child and family outcomes yet children with developmental regression currently wait for extended periods on various subspecialty waiting lists. The lack of a specific assessment and investigation pathway may result in delays to accessing tailored interventions and optimal child and family supports. Research involvement for children with symptoms of developmental regression may be limited if they are yet to receive a diagnosis.

Objectives:

To establish a research-embedded multi specialist assessment clinic to see children who have lost skills in the last year, in a children's hospital in Melbourne, Australia. To document clinical presentations and associated assessment and investigation findings. Here we present the establishment of the clinic and preliminary results from the first 21 eligible referrals.

Methods:

The clinic opened in April 2024. Assessments include a combination of questionnaires to evaluate the child (e.g. Vineland Adaptive Behaviours Scales (VABS)), parent questionnaires to evaluate quality of life and empowerment, clinician interviews and standardised assessments. A paediatric neurologist and clinical geneticist provide an opinion on recommended investigations. Appointments are scheduled at 3 and 6 months to review developmental progression. Institutional Human Research Ethics Committee approval was sought to invite families to consent to share videos for research and data storage in the Skills Loss Registry.

Results:

The clinic received 21 eligible referrals with fourteen children seen to date (n=11, 79% consenting to research), three awaiting assessment and four receiving secondary consultation (n=2, 50% consenting to research). Of the eleven children seen one child was ten years, one was five years at time of assessment, the remaining children were aged 18 months to 32 months. Domains of skill loss included language (n=11), social (n=9), motor (n=3) and cognitive (n=1). Trajectory of regression onset was sudden (n=4), gradual (n=4) or uncertain (n=3). Concurrent events at time of loss were reported for nine children (81.2%). Eight children (72.7%) had parent reported delayed development prior to regression and three (27.3%) achieved age expected developmental milestones prior to loss. At assessment all children seen scored low to moderately-low on the VABS and cognitive development was significantly lower than age expectations (1st percentile). Investigations requested for each child included bloods (n=7), metabolic tests (n=6), chromosomal microarray and Fragile X (n=7), electroencephalograms (n=8) and MRI-brain (n=4). Trio exome sequencing was requested for three children, two diagnostic and one result pending.

Conclusions:

Most children reviewed in clinic were younger than three years old with loss of language and social skills most often reported. Trajectory of loss may be sudden or gradual and concurrent events are common. Two children received a diagnosis via exome sequencing that has assisted their access to services, and tailored interventions and child and family supports. A de-identified skills loss registry is being established and videos collated that will be used to identify further early identification and clinician training opportunities.

418.015 A Service Improvement Project, Exploring Management and Prevalence of Sensory Eating Difficulties, Including Arfid, in Children within the Autism Assessment Pathway in a Local Child Development Centre – Is There Need for a Local Support Service?
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Background: Avoidant restrictive food intake disorder (ARFID) has only been a recognised eating disorder since 2013. Research suggests children with Autism are at increased risk of developing ARFID although prevalence is uncertain. ARFID more commonly affects younger children and can result in serious mental and physical health conditions.

We currently have no local service for children with ARFID, although parents can access a webinar offering advice on management. Current treatment requires referral to a tertiary multidisciplinary feeding service with children needing to be identified and remain under local paediatricians throughout. This project was designed to support the case for creating a locally based service, given the number of children attending local autism diagnostic services who also have limited diets.

Objectives: A proforma looked at various clinical factors and aimed to provide data for the following aims:

- To look at how many children with autism or possible autism have sensory eating issues.
- To check whether growth centiles are regularly checked.
- To look at how often blood biochemistry for nutritional status are being sent.
- To create evidence supporting the need for a local service to be commissioned for children with sensory eating issues.
- To consider the impact of the current pathway for these children.

Methods: Prospective data was retrieved from a local child development centre, between November 2023 and February 2024.

The proforma was filled in prospectively, by clinicians seeing children at various points along the autism assessment pathway, including initial screening appointments, follow ups, diagnostic appointments and educational health and care plan (EHCP) reviews.

Results: Data was taken from 52 children with an age range of 8 months -18 years. 50 children were referred for, or were already diagnosed, with Social Communication Difficulties and/or Autism. Other existing diagnoses included, learning disability and attention deficit hyperactivity disorder. 29 children (55.8%) had a limited food intake and of those 29 children, 12 (42.85%) ate less than 10 foods.

Overall, 41.4% of 50 children had blood biochemistry completed, 62.1% were receiving vitamin supplements, and 57% had weight/growth centiles checked.

Conclusions: Sensory driven limited food intake was identified in over half the children attending the local service for possible autism. Given the numbers of children being seen (The current waiting list is 477 children with a local child population of 30,000), and the frequency of limited diets, results suggest there is need for a locally delivered multidisciplinary service able to support families to increase dietary range and intake for those children, whilst linking with specialist services for more complex cases, e.g. where gastrostomy feeding is being considered. A diagnosis of ARFID, and tertiary referral requires evidence of impaired growth, and/or nutritional status, yet blood testing and growth measurement was often not performed. This current treatment pathway and strict referral criteria, causes delay to treatment of an estimated 3 years. ARFID within the autistic community can be more severe and more resistant to treatment and therefore screening as well as access to local intervention, should be part of routine assessment within autism diagnostic services.

418.016 A Transdiagnostic Understanding of Externalizing Behaviors in Autism

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Background: While decades of research have associated autism characteristics with externalizing behaviors (e.g., aggression, behavioral challenges/conduct problems), more recent accounts from the autism scientific and advocacy communities challenge this relationship. Awareness is growing that externalizing behaviors in autism may be better understood in terms of common, co-occurring mental health concerns such as attentional difficulties and anxiety. To date, few large-scale studies have robustly examined this, especially transdiagnostically – identifying whether autism characteristics are associated with externalizing behaviors independent of an autism diagnosis.

Objectives: To test whether externalizing behaviors are more strongly associated with anxiety and attentional difficulties than the core characteristics of autism.

Methods: 459 participants (91 female, Mean/SD age 10.50/3.06 years) completed an extensive phenotypic battery. 275 carried an autism diagnosis (AUT group), 106 carried a non-autism psychiatric diagnosis (PSY group: anxiety, depression, and/or ADHD), and 76 were neurotypical controls without any psychiatric diagnosis (NT group; see Table 1). Externalizing behaviors were measured via the externalizing subscales of either the Behavior Assessment System for Children (BASC) or the Child Behavior Checklist (CBCL – these two provide analogous *t*-scores). Core autism characteristics were captured by the Social Communication Questionnaire (SCQ) and the Autism Diagnostic Observation Schedule-Calibrated Severity Score (ADOS-CSS). Attention was measured via the Global Executive Composite (GEC) of the Behavior Rating Inventory of Executive Function (BRIEF). Anxiety was captured by child and parent versions of the Screen for Child Anxiety Related Disorders (SCARED-C/SCARED-P). To address content overlap between BRIEF and BASC/CBCL items, separate post hoc analyses examined Aggression and Conduct subdomains of these two instruments.

Results: Across all participants, zero-order correlations between externalizing and autism characteristics were modest ($r=.25, p<.001$ for SCQ, $r=.07, p=.12$ for ADOS-CSS) relative to the large effects of attention (GEC $r=.62, p<.001$) and anxiety (SCARED-P $r=.41, p<.001$). When combined in a single multiple regression model, anxiety and attentional difficulties were significant predictors of externalizing when added last ($r=.48, p<.001$), though the partial correlation for anxiety decreased ($r=.15, p<.001$). When looking at the AUT group only, correlations between autism characteristics and externalizing were near zero ($r=.03, p=.61$ for SCQ, $r=-.04, p=.47$ for ADOS-CSS), whereas attention and anxiety relationships with externalizing remained large (GEC $r=.57, p<.001$, SCARED-P $r=.36, p<.001$). This pattern persisted when examining Aggression and Conduct domains separately. Interestingly, when examining child-reported anxiety (SCARED-C), correlations with externalizing were much smaller ($r=.23, p<.001$) than parent report.

Conclusions: Study findings support the hypothesis that externalizing characteristics in autism may be more closely related to co-occurring mental health concerns than the core features of autism – whether measured by parent or clinician. The attenuation of this effect with child-reported anxiety warrants further investigation of rater effects in future studies. This finding also highlights the importance of mitigating diagnostic overshadowing, and integrating broadband mental health assessment into autism care. Overall, these data expand our view on the determinants of externalizing symptoms among autistic individuals – one focused less on core autism characteristics and more on the co-occurring concerns that are a major part of the autistic lived experience.



418.017 Adverse Childhood Experiences and Mental and Physical Health Outcomes in Autistic Adolescents: Comparing Cumulative Risk and Latent Class Approaches

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Background: Autistic youth experience higher rates of adverse childhood experiences (ACEs) than non-autistic youth. Emerging literature shows that autistic youth who experience a higher number of ACEs are at greater risk of negative mental and physical health outcomes; however, a cumulative risk approach assumes all ACEs confer equal risk. In contrast, a latent class approach, which has not yet been used with autistic youth, groups youth by shared patterns of ACE exposure and examines how specific ACE combinations influence outcomes. Understanding the differential effects of ACEs is crucial for developing trauma-informed interventions to promote well-being in autistic youth.

Objectives: (1) To identify latent classes of ACE patterns in a nationally representative sample of autistic adolescents; (2) To examine associations among ACEs, youth characteristics, and physical and mental health outcomes using cumulative risk and latent class approaches.

Methods: We performed a secondary analysis of the National Survey of Children's Health 2021-2022, a U.S. nationally representative parent-report cross-sectional dataset. The sample included 1311 adolescents aged 12-17 with parent-reported autism diagnoses ($M_{age}=14.66$ years; 80% White; 75% male; Table 2). Exploratory latent class analysis (LCA) of 12 ACE indicators was conducted. Logistic regressions investigated associations between ACEs and mental health (anxiety or depression diagnosis) and physical health (poor/fair vs. good/excellent overall health) outcomes, controlling for youth characteristics. For each outcome, two regressions were conducted: one using cumulative risk (total ACE count, 0-12) and one using latent class membership.

Results: We tested LCA models with two to eight classes (Table 1). A three-class model provided the best-fitting solution (decreased AIC, BIC, SSAIBIC; entropy=.688; LMR-LRT $p<.001$). Class 1 exhibited high probabilities of bullying and income instability, with low probabilities of other ACEs. Class 2 showed high probabilities of discrimination due to race, disability, or sexual orientation and mid-levels of other ACEs. Class 3 had high probabilities of household disruption (parental divorce, death, incarceration, substance abuse, mental illness; home violence) and community violence.

Models with cumulative ACE count and latent class membership predicted similar variability of mental (21-23%) and physical health outcomes (13-14%; Table 2). Each additional ACE increased the odds of anxiety or depression (OR:1.291) and lower physical health (OR:1.156). Youth in Class 2 and Class 3 were >2.2 times more likely to experience anxiety or depression than Class 1. Only Class 2 was associated with greater odds of lower physical health (OR:1.757).

Youth with anxiety or depression were more likely to be female, older, not be Black or Asian, and have ADHD, no intellectual disability (ID), 'moderate' or 'severe' autism characteristics, and higher family income. Youth with low physical health were more likely to be female, have ID, and 'severe' autism characteristics (Table 2).

Conclusions: Findings provide novel insight into the differential impacts of ACEs on autistic youth. While cumulative ACE count was associated with youth health, more specifically, youth who experienced discrimination, household disruption, or community violence were at heightened risk for adverse health outcomes. Tailored interventions at the youth, family, and community levels can foster resilience to mitigate the effects of these ACEs.



418.018 An Ecological Momentary Assessment of Masking during Social Interaction and Near-Term Suicidal Ideation in the Daily Lives of Autistic Adults

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Background: Suicide is the leading cause of premature death in autistic individuals. An estimated 20% of autistic individuals will attempt suicide during their lifetime and 50% will experience suicidal ideation. Research to identify risk factors for suicidality in autistic individuals is drastically needed. One such risk factor could be masking behaviors. Autistic individuals often express distress around masking or suppressing themselves to adhere to social norms. While previous work has found cross-sectional associations between masking and suicidality, longitudinal daily life masking and its proximal association with acute changes in suicidal ideation have not yet been examined.

Objectives: We examined associations between masking during social interactions and suicidal ideation during a 2-week ecological momentary assessment (EMA) protocol. Specifically, we investigated whether masking during social interactions is temporally associated with momentary within-person fluctuations in suicidal ideation. Additionally, we examined whether individual differences in overall levels of masking during social interactions are associated with overall levels of suicidal ideation throughout the EMA protocol. We predicted that individuals who endorsed higher levels of masking in social interactions will endorse higher levels of suicidal ideation, and that within-person momentary increases in masking during social interactions will be associated with greater momentary suicidal ideation.

Methods: Data were from an ongoing study of autistic adults completing an EMA suicide and social interaction questionnaire 8 times a day. Data were from 76 participants [$M(SD)$ age =33.17(10.13) years, 25 assigned male at birth, 51 assigned female at birth]. Masking EMA items asked how much participants "suppressed stimming behaviors", "held back thoughts to not seem weird or different", "tried to keep emotional expressions neutral", and "tried to seem more interested in what someone said" since the last survey on a 0 (not at all) to 10 (very much) scale. Suicide EMA items asked the strength of participants "desire to die" and "desire to kill themselves in the present moment," on a 0 (not at all) to 10 (strongest possible) scale. Data were analyzed using random slope and intercept multilevel models with momentary observations (level 1) nested within individuals (level 2).

Results: Momentary increases relative to one's own mean of self-reported masking during social interactions was significantly associated with momentary elevations of suicidal ideation severity since the last completed survey ($\beta=0.012$, $SE=0.004$, $t=4.14$, $p<0.001$), indicating a temporal association between masking and increases in suicidal ideation. Between persons effects assessing if higher overall levels of masking indicated higher levels of suicidal ideation were insignificant. However, female sex at birth trended towards significance ($\beta=0.11$, $SE=0.06$, $t=1.99$, $p=0.05$), suggesting a possible effect on momentary suicidal ideation.

Conclusions: Masking is a significant predictor of intraindividual increases in suicidal ideation and may be a proximal risk factor for acute suicide risk. In addition, female sex at birth trends towards an increased effect on momentary suicidal ideation. As the sample increases, we will examine whether these effects are moderated by age of autism diagnosis, sex at birth, gender identity, and how these findings may inform suicide prevention/risk intervention for autistic adults.

418.019 Art Therapy for Autistic Adults Against Depression: A Multi-Perspective Study

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Background:

Research indicates that autistic people are more likely to experience mental ill-health, especially depression, which can impact their overall well-being and quality of life. Indeed, mental health support has been highlighted as a topic of research priority by the autistic community. However, autistic people are also less likely to receive effective therapies. Over the years, art therapy has emerged as a promising intervention for autistic people with depression, yet its popularity and accessibility remain low.

Objectives:

This study aims to investigate the reasons behind this underutilisation of art therapy against depression among autistic individuals, and it explores challenges in accessing and delivering art therapy from a varied range of stakeholders such as autistic people themselves, caregivers, and healthcare professionals. This study has a primary objective of identifying factors that contribute to the underutilisation of art therapy against depression among autistic individuals. This will be achieved by 1) examining the perceptions and attitudes of professionals, caregivers, and autistic people themselves towards art therapy as a possible treatment option against depression; and 2) exploring the barriers and challenges faced by autistic people in accessing art therapy services.

Methods:

Through a mixed method online survey, responses of 20 UK-based autistic adults (60% female, mean age = 40, range = 19–67) and 10 UK-based art therapists (90% female, mean age = 42, range = 28–66) were analysed. This questionnaire is divided into different sections with different qualitative and quantitative questions for different stakeholders, and it collects the respondents' demographic information, autism and depression diagnosis or self-identification, as well as experiences and/or opinions on using art therapy for autistic people to manage depression. The qualitative responses were analysed thematically in NVivo, and descriptive statistics were conducted in R to analyse the quantitative data.

Results:

Thematic analysis revealed multidimensional challenges in implementing art therapy to treat autistic people's depression (Figure 1). Volunteers highlighted issues with 1) accessibility (i.e. affordability, availability, and simplicity); 2) professional practice (i.e. autism knowledge, concurrent diagnoses, familial support, integrated care, and relationship building); and making each experience individualised. Interestingly, there was no significant association between the number of challenges perceived (i.e. accessibility, sensory sensitivities, communication...) and confidence in the benefits of art therapy across either groups (autistic adults and art therapists).

Conclusions:

This is one of the first study to systematically report and analyse art therapy experiences on autism and depression. Based on our findings, a new framework (Figure 2) is proposed to help practitioners develop targeted strategies in promoting the use of a promising intervention for a marginalised population, all while considering the capabilities of the current UK healthcare system. Following the fundamental principles of the socio-ecological model, this new framework sets forth the following principles: Individual variability, stakeholder interaction, and leverage point. This study has implications for a range of non-pharmacological therapies to support positive mental health outcomes amongst autistic adults.



418.021 Associations between Feeding Problems and Behavioral Characteristics in Autistic Preschool Children

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Background: Feeding problems are common in children on the autism spectrum disorder (ASD), with reported prevalence rates of 46–89 % compared to 25 % for typically developing children. The feeding problems observed in children on the ASD typically fall into three categories: (1) food selectivity, (2) food refusal, and (3) disruptive mealtime behaviors. These problems are known to result in poorer nutrition and developmental outcomes and affect opportunities for social and community participation (1, 2, 3)

Objectives: There are limited number of studies focusing on the association of feeding problems with behavioral characteristics of ASD. The current study aims to demonstrate relationships between core and associated behaviors of ASD with feeding behaviors in children on the ASD.

Methods: We examined the relationships between feeding behaviors and social, communication, and repetitive behaviors, as well as sensory behaviors, and externalizing and internalizing behaviors in a sample of 146 children on the ASD aged between 2-6 years. Children with a diagnosis of ASD were included to the study and their parents were invited to participate. Parent reports were used to measure feeding problems (Brief Autism Mealtime Behavior Inventory), social communication behaviors (Social Responsiveness Scale), repetitive and ritualistic behaviors (The Repetitive Behavior Checklist Revised), sensory behaviors (Sensory Profile 2), behavior problems (Child Behavior Checklist 1/5-5 years).

Results: The sample included 146 children with ASD and the mean age was 47.4 months. The correlation analysis revealed associations between feeding problems and repetitive and ritualistic behaviors ($p=.000$, $r=.433$), sensory features ($p=.000$, $r=-.514$), social and communication differences ($p=.000$, $r=.327$) and externalizing ($p=.000$, $r=.467$) and internalizing behavior ($p=.000$, $r=.446$). Regression analysis indicated that age ($p=.047$, $\beta=-.117$), internalizing behavior ($p=.010$, $\beta=.312$), and sensory features ($p=.000$, $\beta=-.068$) predicted total Brief Autism Mealtime Behavior Inventory score.

Conclusions: These results demonstrate associations between mealtime behaviors and repetitive behaviors, sensory features, and externalizing and internalizing behaviors. Investigating the relationship between the behaviors exhibited by children with ASD at mealtimes and the core symptoms of ASD and behaviors outside of mealtimes can be a guide in determining appropriate intervention methods for children, such as examining not only mealtime behaviors but also interactions and areas of difficulty outside the mealtime environment.

418.022 Associations between Subjective Sleep Quality, Psychological Distress, and Autistic Traits in Young Women

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Background:

Increasing evidence suggests that elevated autistic traits are prevalent in young adults and have been shown to predict stress, depressive symptoms, and anxiety, particularly among females (McLeod & Anderson, 2023). Regardless of gender, young adults also appear to be especially vulnerable to sleep-wake disturbances and, similar to autistic traits, these sleep challenges have been shown to predict worsened mental health (Becker et al., 2018). In addition, autistic individuals have been shown to demonstrate significantly worsened sleep quality than their neurotypical peers across the lifespan (Fletcher et al., 2017). Yet, no research has examined the relationship between autistic traits and sleep challenges in a nonclinical sample of young women, whether clinical impairment due to autistic traits may moderate this effect, or how these factors interact to affect psychological distress.

Objectives:

The aim of this study was to investigate the relationships between sleep quality and autistic traits and how these variables predict depression, anxiety, and stress in a non-clinical sample of young women.

Methods:

Participants ($n=163$) were largely recruited from a research pool of undergraduate students in psychology and asked to complete a survey via Qualtrics software. Inclusion criteria required participants to be fluent in English, aged 18 to 25 years, and assigned female at birth. Psychological distress was assessed with the Depression Anxiety Stress Scale and provided subscale scores of depression, anxiety, and stress. Autistic traits were measured using the Autism-Spectrum Quotient. In this study, autistic traits were treated in initial analyses as a continuous variable with values ranging from 0 to 50 with higher scores indicating more autistic traits. For subsequent analyses, autistic traits were dichotomized as above or below the clinical cut-off score of 32. Subjective Sleep Quality Rating Scores were pulled from an item on Pittsburgh Sleep Quality Index in which participants are asked to report whether they rate their sleep quality as Poor or Good.

Results:

Significant main effects of sleep quality were identified for impacting psychological distress, such that people who reported poor sleep quality were more likely to report anxiety ($F(2,161)=4.83, p<.01$), depression ($F(2,161)=9.63, p<.001$), and stress ($F(2,161)=8.34, p<.001$). Meanwhile, autistic traits did not predict any aspect of psychological distress— even when conducted on a subsample of women with AQ-50 scores above the clinical cut-off value ($n=35$). Similarly, autistic traits were not associated with sleep quality.

Conclusions:

Poor sleep quality, regardless of autistic trait presentation, led to heightened stress, increased anxiety, and worsened depressive symptoms in a sample of young women. The lack of association between sleep quality and autistic traits was surprising as many studies have found that individuals with higher autistic traits tend to experience worsened sleep quality. As autistic traits were measured in this sample through a self-report questionnaire rather than through a behavioral assessment, additional research is needed to determine whether these associations persist in a sample of women diagnosed with autism spectrum disorder. Through these efforts, researchers will better support autistic women obtain improved sleep and better mental health outcomes.

**418.024 Autism and Anxiety in Girls and Boys**

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Background: Conflicting conclusions from studies make it difficult to research sex differences in autism. Possible explanations for the contradictory findings include underrepresentation of females in research and the difficulty comparing results because autism presentation varies across development, sex, IQ and co-occurring conditions. This research focuses on anxiety, which has been found to be a common co-occurring condition in autism. This is particularly salient as previous research has posited a relationship between sex and anxiety in typically developing children, although results regarding this association in autism have been inconclusive. This study addresses the relationship between sex and the prevalence of anxiety in children between the ages of 4 and 12, including younger children than those in previous studies.

Objectives: The purpose of this study was to explore parent-reported anxiety in girls and boys with autism. The study addresses some of the limitations of previous research by adopting a close matching design to control for male bias, while allowing for the comparison of anxiety at different ages.

Methods: Ninety parents of 45 girls and 45 boys with autism completed the Spence Children's Anxiety Scale. The boys and girls with autism were matched on age and IQ. The preschool and the school-aged forms of the SCAS were used accordingly. The preschool SCAS consists of OCD, social anxiety, separation anxiety, physical fear, and general anxiety subscales while the school-aged anxiety profile adds a panic subscale.

Results: Analyses were conducted on four groups (24 preschool girls, 26 school-aged girls, 21 preschool boys and 19 school-aged boys) in order to assess the expression of anxiety at differing ages. No group differences emerged in IQ or age between the preschool or the school-aged girls and boys. While preschool girls had significantly more parent-reported anxiety than preschool boys in all the subscales except social anxiety, in which no differences emerged, the differences between school-aged girls' and boys' anxiety profiles were more nuanced. No differences between the boys' and the girls' anxiety emerged on OCD, separation anxiety, and general anxiety, whereas the girls revealed significantly more social anxiety, panic and physical fear than the boys did at this age.

Conclusions: This study addressed sex differences in anxiety among children with autism, extending previous research by looking at parent-report anxiety in younger children as well as older ones. Similar to typically developing children, a relationship between sex and anxiety emerged, but comparing younger and older children a more nuanced profile emerged. In younger children the girls revealed more anxiety on all the subscales except for social anxiety, which could be eclipsed into the social impairments of autism criteria. As the children grow, this profile reveals some differences in anxiety presentation. It is important to understand that anxiety in autism may be different than those of typically developing children because of the underlying social difficulties inherent in autism. Thus, the profiles of anxiety in male and female children with autism warrant further investigation.

418.025 Autism in Psychiatric Inpatients with Severe Self-Harm – Screening and Clinical Correlates

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Background: Autism is associated with increased risk of self-harm and suicidal behaviours, but autism may not always be recognised in mental health services. Moreover, autism is underdiagnosed in adult females, and these individuals may be at risk of being misdiagnosed with personality disorder (PD) prior to receiving autism diagnoses. However, accurate diagnosis is important to adapt treatment and services for this population. **Objectives:** To explore the prevalence of autism diagnosis, as well as of being screen positive for autism on the Ritvo Autism Asperger Diagnostic Scale-Revised (RAADS-R), in a clinical sample of psychiatric inpatients with severe self-harm.

Methods: In a national multisite cross-sectional study, 42 adults (40 females, 2 males; ages 18-49 [$M = 29$, $SD = 8$]) with either long (>4 weeks) or frequent (>5) inpatient admissions due to self-harm during the last year, were recruited mostly from acute psychiatric wards. All participants provided informed consent. Data collection included the RAADS-R, clinical diagnoses, data on self-harm and suicidal behaviours, as well as symptoms of depression (Patient Health Questionnaire-9), anxiety (Patient Health Questionnaire – General Anxiety Disorder 7), and post-traumatic stress disorder (PTSD; PTSD Checklist for the DSM-5), alexithymia (Toronto Alexithymia Scale-20), emotion regulation (Difficulties in Emotion Regulation Scale), and functioning in close relationships (Experiences in Close Relationships). In general, the sample had complex psychopathologies, with 91% meeting criteria for PD, most commonly borderline PD (66%). Major depressive disorder (81%) and post-traumatic stress disorder (57%) were common, and the participants reported high levels of childhood trauma.

Results: Four (9.5%) participants were diagnosed with autism. More than half the sample, 24/42 (57.1%) scored over the original RAADS-R cut-off (>65). Even applying the strictest cut-off from the literature (>120) resulted in the number of screen positive being almost three times as high as the number of participants diagnosed with autism (11/24, 26.2%), see Table 1. All participants who were diagnosed with autism, or screen positive at any cut-off, were female. Participants scoring >72 on the RAADS-R reported significantly more symptoms of depression, anxiety and PTSD, and were significantly more likely to be diagnosed with an anxiety disorder (Fisher's exact test, $p = .028$). In addition, these participants reported more severe alexithymia, poorer emotion regulation, and poorer functioning in close relationships, see Table 2. No significant differences were found concerning age of onset, frequency or severity of self-harm and suicidal behaviours.

Conclusions: These results are in line with previous suggestions of an autism subgroup among psychiatric inpatients with severe self-harm. Patients in this subgroup may not have been recognized as autistic, but report more mental health symptoms, as well as poorer functioning and adjustment across a range of domains. However, their pattern, frequency and severity of self-harm may not be clearly distinguishable from other patients with severe self-harm. These findings highlight the importance of screening for and assessing possible autism in psychiatric inpatients with severe self-harm, particularly in females.



418.026 Autistic Adults Experiences of Safety Planning.

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Background:

Autistic people are at significantly increased risk of non-suicidal self-injury and suicidal thoughts and behaviours (STB) compared with non-autistic people. The use of evidence-informed interventions which prevent self-harm and STB are therefore essential for this priority population. Suicide safety planning is one of the most widely used and evaluated suicide prevention interventions. Safety plans consist of a written, prioritized list of coping strategies and sources of support that individuals in crisis can use to manage distress and remain safe. Despite safety plans being recommended by the autism community as a promising suicide prevention intervention for autistic people, few studies have explored whether, or how safety plans are currently used by the autistic community.

Objectives:

In this qualitative study, we interviewed autistic adults with lived experience of self-harm and STB, including suicide attempt, about their experience with, and views on safety planning.

Methods:

The study was approved by La Trobe University Human Ethics Committee (#HEC20235). We recruited $N = 33$ formally diagnosed autistic adults without co-occurring intellectual disability ($n = 16$ women, $n = 14$ men, $n = 3$ non-binary) aged 21 to 68 years ($M_{age} = 41.72$, $SD = 11.49$). All participants had a history of STB. Using qualitative interview questions we asked participants about their prior use and experiences with safety plans in both formal and informal settings. E.g., “Do you have a safety plan in place for when you are feeling suicidal?”; “Can you tell me a bit about what the plan involves? When you might use it? How was it developed, and with whom?”. We used a reflexive thematic analysis approach to examine open-ended responses to prompt questions, and an iterative, inductive process with both latent and semantic coding.

Results:

Approximately 30% ($n = 8$) of participants had experience developing a formal safety plan with the assistance of a mental health professional. A further 11% ($n = 3$) of participants considered themselves to have an informal safety plan (developed by the participant themselves, or in collaboration with a family member). While the remaining 59% ($n = 16$) of participants did not believe they had a safety plan, over half (56%; $n = 9$) described a planned range of strategies that could be considered an informal safety plan. Three main themes and several sub-themes were constructed from the transcribed interviews, reflecting participants' lived experiences and knowledge of safety planning. 1) Having a safety plan that is developed as a personalized, autism-adapted, living document, is crucial to its usefulness. 2) Having a trusted adviser to assist with the development of a safety plan was considered to be essential to the success of the intervention. 3) While safety plans were considered as somewhat useful, demonstrated a limited understanding of both the intent and the application of safety planning.

Conclusions:

Our findings indicate that care needs to be taken to ensure that safety plans are understood in a contextualised way by both the mental healthcare professional implementing the intervention, and the autistic individual receiving the intervention.

418.027 Autistic Adults and Supporters Experiences of Completing Autism Adapted Safety Plans: Lessons Learned for Future Implementation.

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Background:

Autistic people are at increased risk for self-harm and suicide, but few studies have developed or tested suicide prevention interventions for this group. Autism Adapted Safety Plans (AASP) were developed with and for autistic adults and those who support them to reduce self-harm, suicidal thoughts and behaviours.

Objectives:

To explore the experiences of autistic adults who completed AASP, and those who supported them to complete AASP. In particular, whether participants would recommend AASP to others, whether they found it useful for themselves/the autistic person they support, and whether any adaptations or considerations are needed for AASP. We also explored evidence of initial effects of AASP in reducing self-harm, suicidal thoughts and suicidal behaviours in autistic adults.

Methods:

Data were collected as part of a pilot feasibility randomised controlled trial of AASPs. Autistic adults were recruited via community organisations and self-referral. Participants were randomised without stratification to usual care +/- AASP. The AASP was completed by the autistic adults with someone trained to support them. Research staff completing follow-up assessments were blind to participant allocation. Participants were assessed at baseline, 1- and 6-months. The researchers conducted interviews with 47 participants (autistic adults who had completed AASP, and professionals who supported them) 6-months after completing AASP. Data from the interviews were analysed using thematic analysis. Logistic regression compared suicide outcome measures between the treatment and control arm at 1- and 6-month follow-up.

Results:

Many participants were satisfied and would recommend AASP to others. Participants acknowledged that AASP were not appropriate for everyone, and that ongoing appropriate mental health support, and support of a trusted person, were important to successfully complete and use AASP. It was important for professionals to manage the expectations of autistic people and what to do if AASP was not right for them. The visual resources, staged nature and clear structure of AASP, and focus on practical strategies were seen as helpful. AASP could be improved by providing more examples of strategies to incorporate into the plan, having a short version for quick access, and being able to personalise the AASP format, questions and sections much more. In particular, the focus on people to contact for help was particularly difficult for many autistic participants to complete, given social isolation, or not being able to speak or seek help during a crisis. Alternative options and wording could help many more autistic people successfully complete a safety plan. Autistic adults were significantly less likely to report planning suicide at 1-month and 6-months after completing an AASP compared with autistic adults who received usual care.

Conclusions:

AASPs are a potentially valuable intervention for autistic adults, provided that the process of creating it is flexible and sensitive to individual needs. Use of technology, such as in an app could give autistic people much more freedom in personalising AASP maximise its usefulness to themselves. Further adaption and testing of the AASP in different formats to assess its clinical and cost effectiveness in reducing suicidal behaviour could provide a life-saving intervention for autistic adults.

418.028 Autistic Voices on Substance Use Disorders: Navigating Stigma, Treatment, and Recovery

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Background:

Substance use disorders (SUDs) are a public health problem with serious implications for relationships, education prospects, employment and health. SUDs may be just as prevalent, or even more prevalent, among autistic adults versus non-autistic adults. Autistic people experience high rates of psychiatric conditions that are risk factors for SUDs or unhealthy use, including ADHD, anxiety disorders, depression, bipolar disorder, and schizophrenia. Studies suggest autistic people use substances to cope with co-occurring mental health conditions and perceived social difficulties; using substances to cope is an additional risk factor for addiction.

There is limited information about SUD treatment for autistic people. Some evidence shows that SUD treatment providers are not systematically trained to work with autistic people and find this population challenging to support effectively without training or consultation, suggesting that autistic people are less likely to benefit from such treatments. Information about SUDs, treatment experiences, and recovery for autistic people may help inform SUD care and the development of targeted interventions.

Objectives:

Investigate how autistic people experience SUDs, SUD treatment, and recovery in order to provide clinical guidance and inform intervention development.

Methods:

N=32 semi-structured, 30-60 minute interviews were conducted via Zoom. Participants were (1) over 18 years of age; (2) formally or self-diagnosed with autism; (3) English-speaking; (4) able to participate in an interview verbally or via writing; and (5) able to describe their experience with SUD and/or SUD treatment. Purposive sampling was used to recruit a diverse sample (see Table 1). We used a content analysis approach to analyze data. Autistic people with experience in recovery contributed to each part of the project.

Results:

Five themes emerged from the data (Table 2). Participants described (1) origins of SUD, including attempts to address co-occurring conditions or navigate social situations. (2) Autism had myriad effects on recovery from SUD, bringing strengths (e.g., an analytical approach to learning about substances and harm reduction) and difficulties (e.g., creating new routines, lack of social support). Participants discussed the role of (3) masking and burnout in substance use, and how understanding and embracing autism helped with recovery. Finally, participants described (4) systemic barriers to SUD treatment and (5) how to make support more accessible and relevant. Participants particularly appreciated hearing personal stories in groups, online options and accommodations, creating their own goals, having different communication styles honored, guidance for how to reduce harms associated with substance use and navigating setbacks, a holistic focus on the person rather than only focusing on autism or substance use or other mental health conditions, and autism-trained providers.

Conclusions:

Autistic individuals face systemic barriers to accessing and receiving SUD treatment that meets their needs. Targeted treatments and better training for healthcare and mental health providers are indicated. While some challenges, such as the relevance of harm reduction, align with broader use and recovery themes, autism-specific factors—like autistic burnout and masking—require flexible, individualized approaches. Further research is needed to better understand these factors and design interventions that support sustainable recovery and improved long-term outcomes.



418.029 Behavioral Inhibition and Anxiety in Autistic and Non-Autistic Children: DSM-Based CBCL Scores and the Pras-ASD

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Background: Approximately 40% of youth with autism spectrum disorder (ASD) experience clinical levels of anxiety (van Steensel et al., 2011), however the mechanisms underlying the development and maintenance of anxiety in this population are not fully understood. Behavioral inhibition (BI), a temperament or personality trait characterized by caution, shyness, or withdrawal in unfamiliar situations, has been linked to anxiety across both autistic and non-autistic youth (Chetcuti, et al, 2023). Higher inhibitory control in novel situations may lead to heightened reactivity and increased avoidance behaviors, contributing to anxiety (Buzzell et al., 2021).

Objectives: The current study examines the relation between inhibitory control and anxiety in autistic and non-autistic children and potential moderating effects of IQ, assigned-sex, and age using a measure of anxiety specifically developed for autistic youth (Parent-Rated Anxiety Scale for ASD – PRAS-ASD; Scahill et al., 2019) and a broad-band anxiety screener (Child Behavior Checklist [CBCL], Achenbach, 2001). This analysis extends the current literature by a) exploring interactions between inhibition and demographic factors, and b) examining moderating factors driving the relation between inhibition and anxiety using the PRAS-ASD.

Methods: Participants included 147 children (n=73 autistic) aged 4-8 years ($M=6.02$, $SD=1.524$) and their parents enrolled in an ongoing longitudinal study. Parents completed several measures including the CBCL, PRAS-ASD, and Behavior Rating Inventory of Executive Functioning (BRIEF). Children completed the Differential Ability Scales on their first visit. Results were analyzed using two multi-step linear regressions predicting scores on: the 1) CBCL DSM-oriented anxiety scale and 2) PRAS-ASD. Block 1 includes demographic factors (i.e., age, assigned-sex, IQ, diagnosis), block 2 includes behavioral inhibition (i.e., BRIEF BI index), and block 3 investigates interactions between block 1 and block 2 variables.

Results: The first, $F(4,142)=11.009$, $p<.001$, and second, $F(5,141)=11.880$, $p>.001$, CBCL DSM-oriented anxiety models were both significant. The second model demonstrated significant F-change from the first model, $F\Delta(1,141)=11.963$, $p>.001$, with diagnosis, $B=5.676$, $p>.001$, IQ, $B=.114$, $p=.021$, and BI, $B=.227$, $p>.001$ demonstrating significance. Our final model was also significant, $F(7,139)=9.507$, $p<.001$, but did not demonstrate significant F-change, $F\Delta(2,139)=2.812$, $p=.063$. In the final model, only interactions between BI and diagnosis were significant, $B=.312$, $p=.028$. In the PRAS-ASD model, diagnosis, $B=6.178$, $p=.002$, and BI, $B=.346$, $p>.001$, were also significant in the first and second models, $F(5,141)=14.594$, $p>.001$, however, no significant interactions or variables were identified in the final model, $F(6,140)=12.690$, $p>.001$.

Conclusions: A significant interaction between BI and diagnostic group emerged that qualified the main effects for parent-reported anxiety scores on the CBCL. This suggests that although autism and inhibition each impacted anxiety, behavioral inhibition plays a greater role in anxiety among non-autistic children, whereas anxiety for autistic children appears elevated irrespective of inhibition (Fig.1). This interaction was found only when evaluating anxiety traits broadly (e.g., diagnostic-general anxiety screener) rather than in a diagnostic-specific context (e.g., autism-specific anxiety screener). These results may have implications for anxiety treatment in autistic children, especially the role of behavioral strategies such as inhibition and activation. Future research could explore whether autism-specific anxiety screeners better evaluate predictors of anxiety among autistic children.



418.031 Caregiver and Clinician Insights on Cochlear Implantation in Autistic Individuals

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Background:

Approximately 70% of normal hearing (NH) autistic children develop strong oral language abilities. Additionally, most non-autistic cochlear implant (CI) users develop functional spoken language, given early implantation, consistent device use, and access to appropriate rehabilitation services. Despite these notions, existing data suggest that spoken language development is extremely difficult and not a realistic goal for autistic CI users (ACI).

Objectives:

The inconsistencies in the above prompted the current, mixed-methods study aimed at examining clinician and caregiver perspectives on spoken language development in ACIs. We hypothesized that CI function itself would not be the most significant factor in predicting language development, but that device use, behavioral and sensory processing considerations, and lack of clinician training and experience, would each play significant roles. We were also open to novel insights, especially during qualitative inquiry.

Methods:

Phase 1 (Quantitative) consisted of surveys for clinicians (n=16) and caregivers (n=6) of ACIs. Additionally, we elicited caregiver responses from groups of autistic children with normal hearing (ANH; n=4), neurotypical CI users (NTCI; n=4), and neurotypical children with normal hearing (NTNH; n=38). All child participants were between the ages of 3.5-14 years. Those with CIs had used their devices for greater than six months. Caregiver surveys included questions regarding demographics, expressive and receptive language ability, rankings of barriers/contributors to CI effectiveness, and standardized measures of sensory processing and mental health challenges. Clinician surveys incorporated similar questions and surveyed their experience in working with the ACI population. We also conducted language samples with all ACI participants. Quantitative analysis included descriptive, between-groups, and correlational statistics.

In Phase 2, we conducted semi-structured interviews with clinicians (n=9—4 speech-language pathologists and 5 Audiologists) and caregivers (n=6) of ACIs and performed qualitative thematic analysis. Results from both phases converge to triangulate the points reported below.

Results:

Both clinicians and caregivers ranked device/CI tolerance, child behavior/cooperation during intervention, and sensory processing as the top contributors to CI effectiveness and language development. Additionally, our interviews revealed that sensory seeking tendencies were associated with more consistent CI use, while sensory hypersensitivities were linked to greater difficulty tolerating CIs. Furthermore, parent advocacy and clinician training/experience stood out as significant contributors to general CI success.

Five of six ACI participants effectively used spoken language as their primary communication modality, according to our language samples and interviews. Appropriate aural rehabilitation from providers experienced with the ACI population, though scarce, was key to spoken language development. Language difficulties seemed to be more related to autism-related traits (e.g., sensory processing) than hearing loss and device function. Thus, it appears that, if desired, spoken language can be a realistic goal in the ACI population, if appropriate factors are considered. One clinician pointed out that we should not, "...[impose] preconceived limitations on autistic CI users."

Conclusions:

Overall, our results challenge and add to the literature regarding spoken language development in ACIs, in that they are more optimistic and elucidate several significant outcome-related factors not previously considered. These results have implications for future patient and family support by various clinical specialties.

418.032 Changes in Prevalence of Mental, Behavioral, and Neurodevelopmental Disorders Among Autistic Tweens and Their Peers Enrolled in Medicaid

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Background: Children in their tween years undergo dramatic biological, social, behavioral, and developmental changes which set the stage for a variety of co-occurring health conditions, especially mental and behavioral health. Elevated rates of co-occurring conditions in autism are well-established, yet large longitudinal studies of autistic health focusing on the tween years are scarce.

Objectives: We aimed to compare age changes in prevalence of health conditions involving mental, behavioral, or neurodevelopmental (MBND) conditions between tweens with autism and their peers without autism aged 10-13 years at the start of follow-up and 14-17 years at the end.

Methods: This study used national Medicaid claims from 2008-2019, examining all persons with autism, all persons with intellectual disability without autism (ID/No Autism), and a five percent random sample of persons who have neither autism nor ID (No Autism/No ID). Individuals were ages 10-13 years at first Medicaid enrollment and continuously enrolled for a minimum of 10 months per year for five consecutive years of follow-up. We calculated the prevalence of 15 MBND conditions (based on claims-reported ICD9 or ICD10 diagnosis codes) within two-year observation windows during the first two years of follow-up (years 1-2 of follow-up=time point 1, ages 10-13) and last two years of follow-up (years 4-5 of follow-up=time point 2, ages 14-17). For each of the three study groups, we calculated prevalence per condition, per time point, and prevalence rate ratios contrasting autism with each of the other two study groups, per condition, and per time point.

Results: Tween prevalences for MBND conditions at time point 1 (10-13 years) ranged from 0.07% (Social Anxiety disorder in No Autism/No ID) to 14.6% (bipolar disorder in autism) and from 0.16% (OCD in No Autism/No ID) to 16.6% (bipolar disorder in autism) at time point 2 (14-17 years). Overall autistic tweens enrolled in Medicaid ($n=227,782$) had higher prevalences of MBND conditions both at time point 1 (0.09%-14.6%) and time point 2 (0.5%-16.6%) – highest for bipolar disorder, other anxiety disorders, conduct disorders, depressive disorders - compared to the other study groups (ID/No Autism $n=104,547$; No Autism/No ID $n=176,588$) (Figure 1). Similarly, prevalence rate ratios between autism and each of the other study groups were markedly elevated across most disorders at both time points (Figure 2), although the ratios were lower at time point 2. Autistic tweens had lower rates of substance use disorders (drug, tobacco, and alcohol) compared to other study groups (except when compared to the no Autism/no ID group at time point 1), as well as lower rates of PTSD diagnoses compared to the ID/No Autism group at both time points.

Conclusions: During the early tween years (10 to 13 years old) autistic children enrolled in Medicaid already have higher prevalences for many co-occurring MBND conditions when compared to their peers. This difference persists over later years into middle/late adolescence. These results highlight the importance of the development of policies that help identify autistic children entering their tween years who may be at an increased risk of developing MBND conditions.



418.033 Characterizing Key Correlates of Specific Sleep Domains in Youth with Autism.

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Background: Sleep problems are one of the most common and clinically impactful co-occurring conditions in children and adolescents with autism spectrum disorder (ASD). Indeed, sleep problems during childhood have significant negative effects on both the child and their families, impacting various facets of daytime functioning including cognitive functioning, emotion regulation, repetitive and restricted behaviors, with these impacts being exacerbated in autistic individuals. However, we still lack a comprehensive understanding of the specific correlates of distinct types of sleep problems in autistic individuals. Characterizing key correlates of differing sleep profiles may aid in developing individualized sleep interventions for children with ASD.

Objectives: This study examined the relationships between core autism features, emotion dysregulation, and parental sleepiness on fine-grained domains of sleep in autistic children.

Methods: 50 children with ASD (75% male) aged 4-17 years participated in this study. Child sleep problems were assessed with the Children's Sleep Habits Questionnaire (CSHQ), core autism features with the Stanford Social Dimensions Scale and the Dimensional Assessment of Restricted and Repetitive Behaviors, emotion dysregulation with the Child Behavior Checklist (CBCL), and parental sleepiness from the parent sleep habits questionnaire.

Results: Correlation analysis showed insistence on sameness ($r_s = 0.331, p = .018$) and sensory sensitivities ($r_s = 0.358, p = .010$) to be associated with parasomnias. Parental sleepiness was significantly associated with bedtime resistance ($r_s = 0.390, p = .004$) and sleep anxiety ($r_s = 0.294, p = .034$). None of the SSDS subscales were significantly associated with sleep problems. A series of hierarchical regression models were conducted to determine unique predictors of bedtime resistance, sleep anxiety, parasomnias, daytime sleepiness, and total sleep problems. For each model, age was entered in step 1, total problem behaviors (CBCL) in step 2, sensory sensitivities in step 3, insistence on sameness in step 4, and finally parental sleepiness in step 5. Unique profiles of predictors emerged for distinct sleep problems. Specifically, total problem behaviors were associated with total sleep disturbances (beta = 0.171, $p = .004$), parasomnias (beta = 0.035, $p = .006$), and daytime sleepiness (beta = 0.057, $p = .022$), while age uniquely predicted bedtime resistance (beta = -0.346, $p = .010$) and sleep anxiety (beta = -0.269, $p = .003$).

Conclusions: The findings of the current study provide important insights with regards to the nuanced relationships between key correlates and specific sleep problems in children and youth with ASD. Age was negatively associated with bedtime resistance and sleep anxiety, suggesting that these problems are more common in younger children with ASD and targeted interventions to address these challenges may help to prevent ongoing sleep disturbances as the child gets older. Parental sleepiness may also have implications on their ability to implement good sleep hygiene practices contributing to bedtime resistance. The findings also highlight the significant impact of emotion regulation challenges on the presence of parasomnias and daytime sleepiness. Sleep interventions that simultaneously target emotion regulation challenges in children with ASD, may be effective in improving sleep outcomes.

418.034 Characterizing Patterns and Correlates of Nonsuicidal Self-Injury in Autistic Adults

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Background: While approximately 50% of autistic adults report a history of NSSI, it remains understudied despite an association with suicide attempts, and autistic people's advocacy for further research (Moseley et al., 2019). Prior work has found that alexithymia and sensory sensitivities are correlates of NSSI in autistic people. Interestingly, repetitive behaviors, cognitive rigidity, emotion dysregulation, impulsivity, and social anhedonia have not been linked to NSSI in autistic samples, although these constructs have been linked to "stereotyped" self-injurious behaviors in autistic samples and/or with NSSI in nonautistic samples.

Objectives: This study aimed to (1) examine group differences in lifetime and 6-month history of NSSI in autistic vs. nonautistic adults, (2) investigate correlates of history and frequency of NSSI in autistic adults, and (3) explore associations with age of NSSI onset, number of NSSI methods, and time spent thinking about NSSI in autistic adults.

Methods: Data were from an ongoing study on mental health and suicide in autistic vs. nonautistic adults (Projected total N=300 [Autistic n=200]), with both groups oversampled for suicidality. To date, 100 participants (Autistic n=75; M(SD) age= 32.96(10.77) years; Table 1) were administered NSSI questions from the Self-Injurious Thoughts and Behaviors Interview. Participants completed self-reports, including the Comprehensive Autism Trait Inventory (repetitive behaviors, cognitive rigidity, sensory sensitivity), Perth Alexithymia Scale, Emotion Dysregulation Inventory, Emotion Regulation Questionnaire, UPPS (impulsivity), and Social Anhedonia Scale. Log transformations were conducted on 6-month NSSI frequency and number of methods as raw data were skewed. Chi-square tests were used for group differences in history of lifetime and 6-month NSSI. Within the autistic group, hierarchical logistic regressions were used to examine correlates of history of lifetime and 6-month NSSI. Hierarchical linear regressions were used to examine correlates of 6-month NSSI frequency, number of methods, age of onset, and time spent thinking about NSSI. Covariates for all regressions included age, assigned sex at birth, and IQ.

Results: Autistic adults were more likely to report history of lifetime NSSI compared to nonautistic adults (64% vs. 24%), $\chi^2=12.08$, $p<.001$. No group differences emerged for 6-month NSSI history. In autistic participants, the model was significant for history of lifetime NSSI (Nagelkerke $R^2=0.61$, $p<.001$), with more repetitive behaviors ($B=0.64$), and worse cognitive reappraisal ($B=.14$) associated with history of lifetime NSSI; no other variables significantly added to the model. Significant models emerged for 6-month NSSI history, 6-month NSSI frequency, and number of NSSI methods with similar patterns of older age, and more repetitive behavior associations ($ps<0.05$; Table 2). Models for age of NSSI onset and time spent thinking about NSSI were nonsignificant.

Conclusions: Older age and more repetitive behaviors have a strong link with history of NSSI, NSSI frequency, and number of NSSI methods in autistic adults. It will be important for future work to parse the ways in which repetitive behaviors and NSSI may be intertwined. Uncovering mechanisms related to repetitive behaviors will allow better understanding of the emergence and maintenance of NSSI and may aid in development of targeted NSSI prevention and intervention for autistic people.



418.035 Risk of Injury in Children with Autism Spectrum Disorder with or without Attention Deficit/Hyperactivity Disorder - a Retrospective Cohort Study of Pediatric Emergency Department Visits in Israel

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Background:

Autism Spectrum Disorder (ASD) and Attention-Deficit Hyperactivity Disorder (ADHD) are the most prevalent neurodevelopmental disorders in developed countries. While the two are considered two distinct disorders, they have overlapping symptomatology, with some patients diagnosed with both disorders. The prominent symptoms of ASD and ADHD may incline children to experience physical injuries more frequently than typically developing (TD) children. Identifying the risks of different types of injury in this vulnerable population could inform specific actions of parents and caregivers directed to reducing injuries.

Objectives:

In this retrospective cohort study we sought to identify specific patterns of emergency department (ED) visits due to physical injury of children with ASD, ADHD, or ASD+ADHD compared to TD children.

Methods:

We identified 325,412 children who are members of Clalit Health Service (CHS), the largest health service provider in Israel. These children were born between January 1st, 2005 and December 31st, 2009, and followed until December 31st, 2021. Participants were classified into four groups: ASD, ADHD, ASD+ADHD, and TD. Sociodemographic and clinical data, including ED visits and types of injuries as recorded by the ED physician, were extracted from the CHS electronic database. Negative binomial regression models were used to assess differences in incidence rate ratios (IRRs) of ED visits between the study groups and the controls. These models were adjusted for birth year, sector, and socioeconomic status. Furthermore, IRRs for specific injuries were also assessed. The statistical significance of IRRs was assessed using a 95% confidence interval.

Results:

Children with ASD, ADHD, or both were significantly more likely to visit an ED than TD children (IRR=1.48, 95%CI=1.42-1.55; IRR=1.45, 95%CI=1.39-1.52; and IRR=1.29, 95%CI=1.28-1.30, respectively). However, while children with ADHD were more susceptible to visiting the ED due to physical injuries (IRR=1.18, 95%CI=1.16-1.20), children with ASD with or without ADHD had a similar ED visit rate due to injuries compared to TD children (IRR=0.96, 95%CI=0.89-1.05, and IRR=0.91, 95%CI=0.83-1.00; respectively). A focused analysis of the injury profiles revealed that children with ASD or comorbid ASD+ADHD were more prone to ingestion and inhalation injuries (IRR=1.57, 95%CI=1.06-2.25; and IRR=1.80, 95%CI=1.28-2.48, respectively) and less prone to orthopedic injuries than TD children (IRR=0.78, 95%CI=0.69-0.89, and IRR=0.83, 95%CI=0.74-0.93; respectively).

Conclusions:

Our findings suggest that children with ASD experience fewer injuries, probably due to closer adult supervision.

418.036 Clinical Correlates and Prevalence of Insomnia Symptoms in Children with Autism Spectrum Disorder

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Background: Prevalence estimates of insomnia symptoms (insomnia) in children with autism spectrum disorder (ASD) range from 53% to 78%, compared to 20% of children without ASD. This wide prevalence range of insomnia reflects differences in the sample size and source as well as the definition of insomnia. Most prevalence estimates of insomnia in children with ASD are based on parent ratings originally developed for use in a typically developing population. Therefore, these findings may not be generalizable to the broad population of children with ASD.

Objectives: To reduce the potential for ascertainment and measurement bias, this study examined the clinical correlates and prevalence of insomnia using a newly developed Pediatric Autism Insomnia Rating Scale (PAIRS) in children with autism spectrum disorder (ASD) ascertained from a specialty outpatient autism clinic.

Methods: A sample of 103 children 2 to 10 years (mean = 5.8 ± 2.2 , 78% male, 54.5% Non-Hispanic Black, 32.7% Non-Hispanic White, 12.9% other race/ethnicity) evaluated at the Marcus Autism Center and diagnosed with ASD were included. A multidisciplinary team (pediatric nurse practitioner and psychologist) assessed medical and psychosocial histories. Parents rated child insomnia and related impairment on the PAIRS, disruptive behavior on the Aberrant Behavior Checklist (ABC), and quality of life and family functioning on the PedsQL. Children were classified as having insomnia or no insomnia based on the PAIRS. Univariable and multivariable logistic regression modeling was used to evaluate clinical correlates with insomnia. For continuous predictors, odds ratios were scaled based on one-half (0.5) SD increases. Best subsets selection was used to determine the most important predictors for insomnia.

Results: Of 103 children, 33% ($n=34$) were classified as having insomnia; 67% ($n=69$) no insomnia. After adjusting for confounders, the odds of insomnia increased by 2.71 (95% CI: 0.97, 7.58, $p=.057$) for gastroesophageal reflux disease, 2.27 (95% CI: 0.89, 5.80, $p=.088$) for constipation, and 3.68 (95% CI: 1.24, 10.92, $p=.019$) for dietary supplements. For mealtime behavior, the odds of insomnia increased by 1.81 (95% CI: 1.32, 2.49, $p<0.001$) for every half-SD increase in BAMBI total. For disruptive behavior, the odds of insomnia increased by 1.58 (95% CI: 1.21, 2.06, $p<0.001$) for every half-SD increase in Irritability, 1.80 (95% CI: 1.28, 2.53, $p<0.001$) for Social Withdraw, 1.37 (95% CI: 1.05, 1.79, $p=.022$) for Stereotypic Behavior, 1.85 (95% CI: 1.35, 2.54, $p<0.001$) for Hyperactivity, and 1.61 (95% CI: 1.24, 2.11, $p<0.001$) for Inappropriate Speech. For child and family impact, the odds of insomnia decreased by 36% (OR: 0.64; 95% CI: 0.47, 0.85, $p=.003$) for every half-SD increase in child HRQoL, 38% (OR: 0.62; 95% CI: 0.47, 0.83, $p=0.001$) for parent HRQoL, and 38% (OR: 0.62; 95% CI: 0.47, 0.82, $p<0.001$) for family functioning. Hyperactivity/noncompliance, dietary supplements, and mealtime behaviors were the most significant predictors of insomnia in the best subset selection model (ROC = 0.842).

Conclusions: Hyperactivity/noncompliance, dietary supplements, and mealtime behaviors are the most significant predictors of insomnia in a generalized sample of children with ASD. Future epidemiological samples are recommended for a true prevalence estimate.

418.037 Clinical Profiles and Interventions Offered to Children and Adolescents in Psychiatric Care

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Background: Approximately 70% of autistic children present at least one psychiatric comorbidity (Rosen, Mazefsky, Vasa, & Lerner, 2018), which is much higher than among non-autistic children (Joshi et al., 2010). More specifically, when looking at mental health (MH) comorbidities, 44% of autistic children between the ages of 10 and 14 have an anxiety disorder, a phobia and/or a mood disorder (Simonoff et al., 2008). Despite the significant prevalence of psychiatric disorders in autistic children, very few clinics have expertise in both autism and MH. One of the only clinics in Quebec with this dual expertise is the ASD Intervention clinic (Clinique d'intervention TSA; CITSA) of the Rivière-des-Prairies Hospital in Montreal. The CITSA serves a large population of autistic children with MH difficulties. It is therefore an exceptional source of information to better understand the presentation of psychiatric comorbidities in this population.

Objectives: Document the socio-demographic and clinical profile of the autistic children and adolescents receiving care at the CITSA and document the interventions received.

Methods: We carried out a retrospective chart review of the CITSA patient's whose follow-ups ended between April 1st 2022 and March 31st 2023 ($n=120$). An extraction grid was developed in collaboration with CITSA clinicians and validated using 30 random charts. An inter-rater agreement was also done on those 30 files using the Double Data Entry function in REDCap. General information (age, duration of the care episode and professionals seen) was extracted for all patients and more detailed information was extracted for the 30 charts used to validate the extraction grid. Detailed information includes psychiatric and medical comorbidities (as well as other problems such as suicidal ideation or self-harm), number of hospitalizations and information on pharmacotherapy and psychotherapy.

Results: The average age of patients at the first appointment was 13 years old (5 to 17) and patients were seen for 15 months on average (1 day to 5 years). All patients saw a psychiatrist, 25.8% a psychologist, 15% a neuropsychologist, 12.5% a psychoeducator, 13% a social worker, 8.3% an occupational therapist and 2.5% a speech therapist. The majority of the patients (54%) saw only a psychiatrist, 25% saw one other professional, 16% two other professionals and 5% three or more other professionals. Results from the detailed extraction of the first 30 charts showed that the autism diagnosis was removed for 4 patients (13%). The most frequent comorbidities were ADHD (11/26), behavioral or oppositional disorder (7/26) and anxiety disorders (6/26). Almost half of the patients (12/26) were hospitalized before or during their care episode. Pharmacotherapy related interventions were frequently used (21/26), while psychotherapy was offered to 30% of patients (8/26).

Conclusions: Autistic children with MH problems have unique needs in terms of care. A better understanding of the clinical profiles of autistic youth with MH difficulties can inform us on the risk factors and help focus on prevention efforts. Knowledge on the nature of the interventions offered at the CITSA could contribute to improve MH services for autistic children and adolescents.

418.038 Co-Occurrence of Epilepsy and Autism - What Should be the Primary Diagnosis?

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Background:

Epilepsy and autism spectrum disorder (ASD) are two prevalent neurodevelopmental conditions that together affect approximately 2-3% of children worldwide. Although ASD and epilepsy are considered two distinct conditions, they share certain pathophysiological mechanisms and clinical characteristics. Furthermore, some people are diagnosed with both conditions. In such cases, it is often unclear which condition predisposes the other one and which should be the primary diagnosis. In other words, it remains uncertain whether the co-occurrence of epilepsy and ASD represents a unique neurodevelopmental condition or if it should be classified as a subtype of one of these disorders.

Objectives:

To identify similarities and differences in sociodemographic and clinical characteristics between children with co-occurring ASD and epilepsy and those with either ASD or epilepsy alone.

Methods:

We conducted a retrospective cohort study of all children who are members of Clalit Health Services (CHS), the largest health service provider in Israel, who were born between 2010 and 2020 and followed until May 2024. We identified all children diagnosed with either epilepsy or ASD (or both) and obtained sociodemographic data, as well as data about the pregnancy, birth, and postnatal chronic diagnoses of these children from the electronic database of CHS. Finally, we compared the prevalence, sociodemographic, and clinical characteristics between three study groups: 1) children with ASD without epilepsy ("ASD"); 2) children with epilepsy without ASD ("epilepsy"); and children with co-occurring ASD and epilepsy ("ASD+epilepsy").

Results:

The study cohort included 1,465,958 live births, of which 34,277 (2.34%) of them were diagnosed with either ASD or epilepsy. Opposite trends were seen in the prevalence of ASD and epilepsy during the study period (**Figure 1A**). While ASD prevalence has more than doubled (from 1.02% for children born in 2010 to a peak of 2.26% for children born in 2018), the prevalence of epilepsy has constantly declined (from 0.84% to 0.44% in the same years). At the same time, the prevalence of children with co-occurring ASD+epilepsy remained relatively stable with similar rates of epilepsy and ASD as the primary diagnosis in these children (**Figure 1B**). Interestingly, children with co-occurring ASD+epilepsy were more similar to children with only ASD than children with only epilepsy in their sociodemographic and obstetrics characteristics. However, they had significantly higher rates of intellectual disability, ADHD, gestational problems, and motor coordination problems than children with either epilepsy or ASD alone ($p < 0.001$). Finally, higher rates of specified types of epilepsy were seen among children with only epilepsy than in children with epilepsy+ASD (21.6% vs. 16.5%; $p < 0.001$), whereas no significant differences in the severity of ASD symptoms were seen between the two ASD groups.

Conclusions:

The findings from this study suggest that the co-occurrence of epilepsy and ASD is not a distinct, homogeneous condition but rather a mixture of both conditions. Elucidating the pathophysiological mechanisms underlying the co-occurrence of these conditions may shed brighter light on this intriguing phenomenon.



418.040 Comparing Rates of Significant PTSD Symptoms and Formal Diagnosis of PTSD Among Autistic Adults

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Background: Autistic adults experience high rates of traumatic events and high levels of symptoms of posttraumatic stress disorder (PTSD), including symptom profiles that are consistent with diagnosis of PTSD. However, autistic adults are also formally diagnosed with PTSD by healthcare providers at low rates. It is important to clarify rates of PTSD diagnosis and levels of PTSD symptoms among autistic adults and to explore variables that may be associated with the absence of community-based PTSD diagnosis to improve identification of PTSD and posttraumatic stress support.

Objectives: This study aims to (1) establish rates of probable PTSD (i.e., significant endorsement of PTSD symptoms consistent with PTSD diagnostic criteria, as measured by the PTSD Checklist for the *DSM-5* (PCL-5)), and rates of community-based PTSD diagnosis among autistic adults and self-identifying autistic adults; and (2) to identify variables that may be correlated with the absence of community-based PTSD diagnosis among those who present with significant symptoms via self-report (i.e., presentations of probable PTSD but no receipt of a community-based PTSD diagnosis).

Methods: The current study recruited 214 formally-diagnosed autistic adults (i.e., indicated having a formal autism diagnosis by a professional) and 62 self-identifying autistic adults (i.e., self-identified as autistic but had not received a formal autism diagnosis by a professional) via an online survey platform. Participants completed the Life Events Checklist for *DSM-5* (LEC-5) to screen for traumatic events, the PCL-5 to assess PTSD symptoms, and the Patient Health Questionnaire four-item version (PHQ-4) to assess depression and anxiety symptoms. Participants reported whether they currently have a formal diagnosis of PTSD given by a professional ("community-based PTSD diagnosis"). Probable PTSD was determined if PCL-5 items were endorsed at a significant level (Moderately, Quite a Bit, Extremely), if symptoms were consistent with *DSM-5* PTSD criteria (at least one re-experiencing symptom, one avoidance, two alterations in cognition/mood, two alterations in arousal/reactivity), and if total symptom scores surpassed 33 or higher.

Results: Autistic adults demonstrated high rates of probable PTSD and low rates of community-based diagnosis, and there were no differences across groups of formally-diagnosed and self-identifying autistic adults (see Table 1). Among those who self-reported symptoms of probable PTSD on the PCL-5, small percentages reported having community-based diagnoses of PTSD (36% of formally-diagnosed autistic adults, 32% of self-identifying autistic adults). Across both groups of individuals who endorsed probable PTSD, the lack of a community-based diagnosis positively correlated with levels of all PTSD symptoms (moderately) and anxiety and depression symptoms (weakly; see Table 2). Lack of a community-based PTSD diagnosis positively correlated (weakly) with the number of traumatic events that formally-diagnosed autistic adults learned about.

Conclusions: Autistic adults endorse clinically significant levels of PTSD symptoms but low rates of community-based diagnosis of PTSD. Not having a community-based PTSD diagnosis despite self-reporting probable PTSD correlated with higher mental health symptoms. High levels of mental health symptoms may relate to lower likelihood of PTSD identification, perhaps due to diagnostic overshadowing. Future research should aim to understand factors associated with diagnosis of PTSD to improve trauma-related support.



418.041 Comparison of Self-Care Development Among Children with Typical Development, Autism Spectrum Disorder, and Other Developmental Conditions

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Background:

Self-care involves activities that individuals perform to maintain their independence at home and school, such as eating, drinking, dressing, and toileting. Children with autism spectrum disorder (ASD) often face challenges in these activities due to their autistic traits or sensory processing difficulties.

Objectives:

To better understand self-care development and its progression, this study aimed to examine self-care performance in both children with and without ASD.

Methods:

We recruited caregivers of children aged 0 to 12 years, including children with typically development (TD), children with ASD and children with other developmental conditions (DC), based on caregiver reports. The Self-Care Performance Assessment, a caregiver-reported questionnaire, was used to assess the children's self-care abilities. Caregivers completed the questionnaire at three time points: the initial evaluation, a 6-month follow-up, and a 1-year follow-up. Children were divided into three diagnostic groups: TD, ASD, and DC. Each diagnostic group was further categorized into four age ranges: 0–3, 4–6, 7–9, and 10–12 years. Mean total scores of the SCPA were calculated for each diagnostic and age group at the three time points. An analysis of variance (ANOVA) was used to compare self-care performance across diagnostic categories within each age group.

Results:

A total of 203 children participated in the study, including 127 in the TD group, 33 in the ASD group, and 43 in the DC group. No significant age differences were found across the diagnostic groups within each age group. Compared to the TD and DC groups, the ASD group exhibited significantly lower self-care performance in the 7–9 and 10–12 age groups at all three time points. Regarding developmental changes, the TD group showed the greatest improvement at the 1-year follow-up (mean change score: 1 to 30 across different age groups), followed by the ASD group (mean change score: 9 to 20 across different age groups), with the DC group showing the least improvement (mean change score: 2 to 16 across different age groups).

Conclusions:

Our study compared self-care development across different diagnostic groups. The findings provide valuable insight into the developmental baselines for TD children and highlight potential progress patterns across diagnoses over one year. The findings suggest distinct trajectories in self-care development, particularly in children with ASD and DC. Future research is needed to explore the mechanisms underlying these changes in self-care development.

418.042 Convergent Validity of the Anxiety Scale for Autism in Adults (ASA-A)

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Background:

Autistic adults experience anxiety at a higher rate than non-autistic adults (Nimmo-Smith et al., 2020). Previous research has shown that the experience of anxiety may be different for autistic people, such as experiencing worry and uncertainty about routines and novelty and social anxiety not related to evaluation (Kerns et al., 2014). The Anxiety Scale for Autism - Adults (ASA-A) is a self-report measure used to assess anxiety in autistic adults. The 21-item Depression, Anxiety and Stress Scale (DASS-21) is a commonly used measure of general symptoms of depression and anxiety in both general and clinical populations. Assessment of the convergent validity of the ASA-A would be beneficial for both the continued use of the ASA-A and the interpretation of DASS-21 scores in autistic populations.

Objectives:

Demonstrate the validity of using the ASA-A as a general measure of anxiety in autistic adults through an assessment of convergent validity with a widely used measure of depression and anxiety (DASS-21).

Methods:

As part of a secondary analysis of an existing dataset, ASA-A and DASS-21 data from 182 participants [male = 69, female = 91, gender expansive = 22, age ($M(SD)$) = 26.95(11.16)] was analyzed. In addition, the Autism Spectrum Quotient (AQ), and the Camouflaging Autistic Traits Questionnaire (CAT-Q) were also administered. Internal validity of the ASA-A for the population was assessed using inter-item correlations and Cronbach's α 's. Convergent validity between the ASA-A, the DASS-21, the AQ, and the CAT-Q was also assessed.

Results:

All ASA-A subscales were significantly related to one another ($p \leq .001$), with good internal consistency for subscales (Cronbach's α (range) = 0.859 to 0.881) and excellent total internal consistency (Cronbach's α = 0.928). The total ASA-A score showed a strong correlation with anxiety ($P = 0.758$) and stress subscales ($P = 0.748$) on the DASS-21, and a moderate correlation with depression ($P = 0.596$). In comparison, the total ASA-A score showed a correlation of moderate strength with the CAT-Q total score ($P = 0.562$) and no significant correlation with the AQ. Of the ASA-A subscales, the anxious arousal subscale showed the strongest correlation with the anxiety subscale of the DASS-21 ($P = 0.823$), and moderate correlations with the stress ($P = 0.681$), and depression ($P = 0.573$) subscales. The social anxiety and uncertainty subscales both showed moderate correlations (all $p \leq .001$) with the stress ($P_{\text{socanx}} = 0.541$; $P_{\text{unc}} = 0.685$), anxiety ($P_{\text{socanx}} = 0.508$; $P_{\text{unc}} = 0.556$), and depression ($P_{\text{socanx}} = 0.434$; $P_{\text{unc}} = 0.505$) subscales of the DASS-21.

Conclusions:

The ASA-A and the DASS-21 are significantly predictive of one another. Although the ASA-A is closely related to both the anxiety and stress subscales of the DASS-21, certain subscales may be better predictors of stress, while others may be better predictors of anxiety. The ASA-A does not assess for symptoms of depression, but is still predictive of depression scores. Continued use of a complementary depression symptom inventory is recommended.

418.043 Corticospinal Tract Microstructure Associated with Hypotonia in Young Autistic Children

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Background: Hypotonia, or low muscle tone, is more frequently observed in young autistic children than non-autistic children. Hypotonia can cause delays in the motor skill development, which can, in turn, impact cognitive and social development during early childhood. Despite the common prevalence, the neural underpinnings of hypotonia remain poorly understood. Recently, research has begun to understand the role of sensorimotor pathways in motor abilities within the autistic population among autistic school-aged children. The corticospinal tract (CST), a key sensorimotor pathway, serves as the primary tract responsible for voluntary movement in the body. Given that differences in muscle tone often emerge in infancy, we hypothesize that structural differences in the CST may manifest even earlier. Therefore, this study seeks to investigate the developmental profiles associated with hypotonia in young autistic children, and subsequently examine the relationship between the microstructural properties of the CST and the presence of hypotonia. Given the established sex-specific developmental trajectories identified in autism, this study explored the potential moderating role of sex assigned at birth on these associations, aiming to provide deeper insights into motor impairments and inform more tailored interventions.

Objectives: 1) Compare the developmental profiles between young autistic children with hypotonia vs. without hypotonia. 2) Investigate the structural properties of corticospinal tract associated with hypotonia in young autistic children.

Methods: The current project included 171 children, who completed comprehensive assessments and met diagnostic criteria for autism spectrum disorder between the ages of 2 and 3.5 years. Developmental pediatricians conducted physical exams that included muscle tone assessments. Psychologists administered a battery of neuropsychological tests to evaluate a wide range of domains. Structural MRI scans, T1-weighted and diffusion-weighted, were obtained to assess brain structure and connectivity. Regression analyses were performed to assess the developmental characteristics and structural properties of the CST associated with hypotonia, as well as to test for moderating effects of sex on these associations.

Results: Compared to autistic children without hypotonia, autistic children with hypotonia had lower scores on the Short Sensory Profile Low Energy/Weakness Domain. However, no significant differences were found between the groups in other developmental outcomes (Table 1). There was no significant interaction between sex assigned at birth and these developmental outcomes. Sex moderated the relationships between hypotonia and fractional anisotropy of the CST. Specifically, in autistic girls, hypotonia was related with lower fractional anisotropy of the left CST, whereas in the autistic boys, hypotonia was related to with higher fractional anisotropy of the right CST (Figure 1).

Conclusions: This work suggests that the hypotonia in young autistic children is related to low energy level and strengths. The neural mechanisms of hypotonia within autistic children may vary based on the sex assigned at birth. Specifically, stronger, more coherent connections in the CST may lead to intact muscle tone development in autistic females. While future research is necessary to explore the impact of hypotonia across developmental trajectories, these findings provide insights into the biological basis of neuromotor control in autistic children and underscore the importance of assessing motor skills in this population.

**418.044** Delayed Diagnosis of Autism Due to Masking of Autism By ADHD Comorbidity and Female Gender

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Background:

Autism Spectrum Disorder (ASD, autism) and Attention- Deficit/ Hyperactivity Disorder (ADHD) diagnoses in childhood are more common in males, but ADHD prevalence in adults is similar between males and females. Autism diagnosis in females has increased, with male-to-female ratio dropping from 1:4-5 a decade ago to 1:2.5-3 recently. This has led to the term "camouflage," suggesting that females may exhibit different autism symptoms, causing delayed diagnosis and may delay appropriate interventions, which may influence outcome. ADHD symptoms may present early in children with autism and symptoms may overlap. Comorbidity of ASD and ADHD may further delay diagnosis of autism in both males and females.

Objectives: Using a large neurodevelopmental database, we investigated the timing of ADHD and autism diagnoses across ages, and the sex distribution of these diagnoses and comorbidities.

Methods: Data were drawn from Maccabi Healthcare's electronic records for 2.4 million individuals, including information on autism, ADHD, epilepsy, depression, anxiety, medications, demographics with emphasis on age of each diagnosis and difference from current age (up to year 2023). The autism group was divided into those with only autism (9,604 individuals) and those with both autism and ADHD (8,964 individuals). The ADHD-only group (228,668 individuals) served as the control group. We analyzed diagnosis timing and comorbidities across these groups and male to female distribution.

Results:

The study included 24,067 individuals with autism (22.8% females), diagnosed according to Israeli Ministry of Health guidelines. The control group consisted of individuals diagnosed with ADHD (42.9% females), included only if ever received medication. Almost half of the individuals with autism also had ADHD (45.3%), with significantly more males having both diagnoses (61.1%). The male-to-female ratio was similar in the autism-only and autism+ADHD groups (76% males). Among females with autism, 39.7% had ADHD as a comorbidity. Stimulant medications were used in 71.2% of males and 68.7% of females with autism+ADHD.

Epilepsy occurred in 7.51% of the autism cohort, with higher prevalence in females (9.2%) as compared to males (7%). It was more common in individuals with both autism+ADHD (7.74% males, 9.9% females). In the ADHD control group, epilepsy was diagnosed in 1.85%, comparable to general population, but interestingly with a higher rate of epilepsy in ADHD females (2.4%) as compared to males (1.8%).

Children diagnosed with ADHD before autism received their autism diagnosis 2-3 years later than those with autism only and later than with autism and subsequent ADHD diagnosis, with the gap decreasing into adulthood. Delays were more frequent before 2010, particularly in boys. However, girls experienced more consistent delays in diagnosis of autism, especially girls diagnosed initially with ADHD.

Conclusions: To avoid potential delays in ASD diagnosis, clinicians should consider ASD in persons presenting with ADHD symptoms. Additional attention should be given to girls with ADHD and observation for additional comorbidities, especially occurrence of epilepsy, should be emphasized.

418.045 Diagnosis of Autistic Spectrum Disorder in Patients with Fragile X Syndrome: A United Kingdom Database Study.

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Background:

Fragile X syndrome (FXS) is caused by a gene mutation that leads to the absence or deficiency of fragile X messenger ribonucleoprotein, which is essential for normal brain development. FXS is suspected as a common cause of autism spectrum disorder (ASD) but also shares significant behavioural and developmental features with ASD, including social and communication difficulties, repetitive behaviors and sensory sensitivities.

Objectives:

This study explores the presence of ASD in patients with FXS.

Methods:

Patients were selected from the UK CPRD Aurum dataset, a primary care database with approximately 20% coverage of England. Data in CPRD is linked to secondary care data via Hospital Episode Statistics (HES). This study was granted CPRD Research Data Governance approval (21_000470). The study period was 01/04/2007- 31/12/2020. Patients with FXS were selected by relevant clinical code in either the CPRD Aurum or HES datasets. A prevalent FXS population was defined as patients with active registration at a CPRD practice on 1st of January 2019. Prevalent FXS patients were matched 1:1 to controls by age, gender and primary care practice. Co-existing ASD was flagged and compared between FXS cases and controls. The incident cohort were patients with continuous CPRD registration from birth, defined as a registration date being within 3 months of their month of birth or same year of birth if month of birth was missing. Index date was defined as date of first diagnosis. Presence of ASD and timing of ASD and FXS diagnoses was explored.

Results:

1,520 patients formed the prevalent. 64.7% of the cohort were male; mean age was 31.9 years. Median age at first recorded FXS diagnosis was 9.0 years. A diagnosis of ASD was recorded for 332 (21.8%) cases and 92 (1.9%) controls ($p < 0.001$). The incident cohort comprised 259 patients. ASD was recorded for 88 (34.4%) patients of whom, 38 (43.2%) had ASD diagnosed on or prior to the diagnosis of FXS and 50 (56.8%) diagnosed with ASD subsequently. Median duration between prior ASD diagnosis and FXS diagnosis was 281.5 days (Inter-quartile range [IQR] 73.25-1488.0). For 12 (28.9%) patients there was greater than three years between the diagnoses. For patients first diagnosed with FXS who were subsequently diagnosed with ASD, the median duration was 545 days (IQR 172.0-1,574.0). Median age at diagnosis of FXS was lower for those diagnosed with ASD; 3.0 (IQR 2.0-5.0) years for those with a subsequent ASD diagnosis, 4.5 (IQR 3.75-10.25) for those with a prior diagnosis compared with 5.0 (3.0-7.5) years for those with no ASD diagnosis.

Conclusions:

Approximately one-fifth of prevalent patients with FXS had a diagnosis of ASD; whilst in the incident cohort, ASD was recorded for one-third, possibly reflecting improved diagnosis at an earlier age in more recent practice. ASD may be captured in the social/educational context and thus may be missing from the data sources used in this study. In some patients with FXS and ASD there was considerable delay between both diagnoses being recognised. Screening ASD patients for FXS and vice-versa could improve diagnosis and expedite service provision..

418.046 Differential Impact of Co-Occurring Anxiety and Attention-Deficit/Hyperactivity Disorder on Males and Females with Autism

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Background: Autism Spectrum Disorder (ASD) impacts males more frequently than females, with an estimated male:female ratio of 3:1-4:1. Females are also underrepresented in research which further limits our understanding of their ASD symptoms, with serious downstream effects on clinical knowledge. Gaps in clinical knowledge about autistic females hinder timely and accurate diagnosis and access to effective treatments for this critically understudied and underserved subgroup. This is particularly important when designing studies that aim to reduce the impact of heterogeneity on ASD research by defining specific subtypes within the autism spectrum, including those with co-occurring psychiatric conditions. Despite the high frequency of psychiatric co-occurrence (up to 70% of those with autism have one co-occurring psychiatric condition and up to 40% have two co-occurring conditions), little is known about the impact of this co-occurrence in autistic females. However, large cohort descriptive study designs have reduced that barrier.

Objectives: We leverage a large, US national descriptive study (SPARK) to examine how behavioral and psychiatric symptoms differ between autistic girls and boys in well-defined groups (i.e., school age and adolescence; those with and without co-occurring anxiety and attention deficit/hyperactivity disorder:ADHD). We hypothesize that the presence of co-occurring anxiety will result in increased repetitive behaviors and mood concerns, and that presence of co-occurring ADHD will result in increased motor concerns, particularly for females.

Methods: Participants included 25,078 individuals registered in the SPARK cohort, aged 6-18 years. Individuals with parent-reported ASD, ASD+ADHD, ASD+Anxiety, or ASD+ADHD+Anxiety were compared on parent-report measures assessing social communication, restricted and repetitive behaviors, motor functioning, and behavioral/emotional concerns; differences between male and female profiles were examined.

Results: Significant differences in symptom presentation between females/males, school-age/adolescent individuals, and by co-occurring conditions (ASD/ADHD/Anxiety) were revealed, and the impact of co-occurring conditions differed by age and sex. For young females, the addition of co-occurring ADHD or Anxiety alone significantly increased reported ASD symptomatology. Diagnostic group differences in motor functioning were driven primarily by co-occurring conditions, particularly ADHD status (most apparent for young females, wherein young females with ASD + ADHD or ASD+ADHD+Anx had weaker motor skills than young females ASD alone). All diagnostic groups were reported to have elevated concerns for RRBs; younger children had more RRBs than older adolescents across both sexes. Within females, younger participants showed a strikingly different pattern than older females; whereas co-occurring Anxiety or ADHD was not associated with increased RRBs in young females, these co-occurring disorders were associated with increased RRBs in older females. Last, addition of co-occurring conditions increased symptoms across all behavioral/emotional scales, with nearly all subscales raising to clinical significance for the ASD+ADHD+Anx group for both age and sex groups.

Conclusions: School-aged females with ASD are at highest risk for underestimation of autism-related symptoms, including underestimation of symptoms beyond core ASD features. Across ages, particular consideration should be given when probing for social communication symptoms, RRBs, motor skills, and mood in females with ASD alone, as well as with co-occurring ADHD and/or Anxiety, including use of measures intended to more dimensionally assess particular symptom domains.

418.047 Disclosure of Suicidal Thoughts and Behaviors and Self-Harm in Autistic Adolescents from Adolescent and Parent Perspectives: A Mixed-Methods Investigation

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Background: Suicidal thoughts and behaviors (STB) and self-harm are common in autistic adolescents, with few adolescents receiving supports. Disclosure is an essential component of risk assessments and prevention programs as it is the first step to detecting youth at risk and preventing future crisis. Our previous research demonstrates that half of autistic adolescents in crisis never disclose to their parents. However, disclosure experiences (e.g., barriers, facilitators, etc.) have never been investigated in autistic adolescents; this information is critical to improving risk assessments, suicide prevention programs, and parent training.

Objectives: To investigate disclosure experiences of STB and self-harm in autistic adolescents from adolescent and parent perspectives using a mixed-methods approach.

Methods: In a longitudinal investigation of depression and suicide risk in autism, 35 adolescents ($M=15.9$ years; $SD=1.2$; Range: 14-17; 14 males, 10 females, 11 gender diverse) and 35 of their parents completed an assessment battery. We plan to analyze data from an additional 30 families by May 2025. In the battery, families completed a novel measure of STB and self-harm disclosure experiences – Suicide and Self-harm Disclosure Interview (SSDI). The SSDI contains quantitative and qualitative questions about disclosure in three categories: suicidal thoughts, suicide attempts, and self-harm. For adolescents, the SSDI examines barriers and facilitators of disclosure, needed crisis supports, and likelihood of future disclosure. For parents, the SSDI contains similar questions about barriers and facilitators to discussing STB and self-harm with their child, and resources to support parents in managing crisis. The SSDI was administered to adolescents and parents separately and audio recorded, with responses transcribed and analyzed using NVivo. Descriptive statistics were employed to analyze the quantitative data, while conventional content analysis was applied to qualitative responses.

Results: All 35 adolescents reported lifetime suicidal thoughts, with some reporting a suicide attempt ($n=7$; 20%) and self-harm ($n=20$; 57%). Table 1 present some of the findings. Adolescents disclosed to different people (e.g., friends, parents, online forums), with parents as the most common, for the primary purposes of seeking help. Reactions to adolescents' disclosure were mixed (i.e., positive and negative reactions), and adolescents provided suggestions to improve disclosure experiences (e.g., "take me seriously") and resources for autistic adolescents in crisis (e.g., training for teachers, peers/friends). Of adolescents who never disclosed their crisis to others, feelings of shame and perceived burdensomeness were leading reasons for never disclosing. Differences in reports of adolescent STB and self-harm emerged between adolescents and parents, with some adolescents never disclosing to parents ($n=5$; 14%). Most parents reported a positive response to their child's disclosure, while some parents dismissed it ($n=9$; 25%). Parents identified positive (e.g., awareness of child's distress) and negative (e.g., upset, crying) aspects of their responses to their child; parents overwhelmingly reported low confidence in knowing how to respond ($n=29$; 83%). Parents also suggested critical supports for families (e.g., crisis training, mental health services).

Conclusions: Findings provide unique insights on STB and self-harm disclosure experiences among autistic adolescents, with considerations of parents' experiences. Findings directly inform STB and self-harm assessment and intervention approaches for this population.



418.048 Do Asymmetrical Developmental Bifurcations Predispose to Each Other? a Bibliometric Analysis

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Background: We have proposed to integrate prototypical autism in the same category of human biological variants as twinning, left-handedness and breech presentation (BP) through the concept of asymmetrical developmental bifurcations (ADB). ADB differ from diseases and are more specifically defined that the concept of neurodiverse variant. ADB would happen in development when "frequent" and "rare" trajectories are compatible with life, and that one of them, despite its occasional adaptive cost, is preserved by evolution. Each ADB occurs at a constant rate in human species and is mostly favored by familial predispositions, occasionally powered by an indefinite series of nonstandard events. It may also occur randomly, as a human possibility that does not require external factors or biological dysfunction. Among their favoring factors, we know that some ADB influence each another, as there is a higher percentage of left-handedness among autistic people than in the general population.

Objectives: We investigate here how scientific literature may represent a proof of concept of ADBs' mutual predisposition.

Methods: In this bibliometric analysis based on performance analysis, the metric was the total number of publications and the number of meta-analyses or systematic review on each pairing of ADB. Only PubMed was searched. We used predetermined terms for each ADB and used the Boolean Operator "AND" to find articles concerning each pair. Native PubMed functions were used to for the citation extraction. Data extraction ended in July 2024. To account for the diversity of the level of research on each subject, we calculated the intersection over union for each pairing. By doing this, popular subjects that would obviously have more articles became less of a bias.

Results: Meta-analyses or systematic review were found for twinning and breech presentation, left-handedness and autism, left-handedness and twinning, as well as autism and breech presentation. ADB pairs who had relatively the most articles were twinning and breech presentation, along with left-handedness and twinning. Nonetheless, left-handedness and twinning as well as autism and twinning were individually represented by a larger number of publications (see Fig. 1). The scope of this research is limited by the fact that there was no study selection, and that definitions of most ADB are still evolving.

Conclusions: This result represents a proof of concept of the reciprocal predisposition between some ADB, adding to the redefinition of autism as the rare result of a bifurcation instead of a disease. This provides a biological justification to the alternative organizations within the social and conceptual integration of neurodiversity. Hence, if we observe that some ADB mutually influence one another, it could be an argument to confirm that they are of the same nature. Future directions will involve adding MESH terms to the search, searching other electronic databases, and adding a selection process by reading titles, then abstracts.



418.050 Echo Autism: Mental Health - Preparing Professionals to Support Autistic People with Co-Occurring Mental Health Conditions

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Background:

The majority of autistic individuals struggle with co-occurring mental health conditions. Mental health challenges are associated with lower quality of life, reduced social activity, poor educational performance, and limited employment opportunities. However, autistic people often experience difficulties accessing mental health care. One of the well-known barriers to mental health services is a lack of training among mental health clinicians for working with autistic individuals.

Objectives:

The objective of this research is to assess the program's impact on clinicians' self-efficacy in using evidence-based practices for supporting autistic clients' mental health, identify the most valuable components of the program as perceived by participants, and explore the changes participants plan to incorporate into their clinical practice based on the knowledge gained. The main research questions are:

- Did the program increase clinicians' self-efficacy in using evidence-based practices for mental health supports of autistic clients?
- What did participants perceive to be the most valuable components of the ECHO Autism: Mental Health program?
- What changes will participants incorporate into their clinical practice as a result of knowledge acquired in the program?

Methods:

ECHO Autism: Mental Health is a virtual, de-identified case-based professional development program committed to creating a learning community of mental health clinicians supporting autistic clients. The current study investigated the experience of the clinicians in the ECHO Autism: Mental Health program from 2020-2023. A total of 72 participants completed pre- and post-program assessments to evaluate the impact and benefits of ECHO Autism: Mental Health.

Results:

Nearly all of the participants' responses (99%) stated that the program was a feasible and effective way to learn ($n=537/541$); 97% ($n=526/541$) agreed or strongly agreed that their self-efficacy increased in implementing evidence-based practice, specifically cognitive-behavioral therapy (CBT), for their autistic clients. In their open-ended responses, participants reported that they learned the most from the case studies and didactic sessions and as a result are more knowledgeable about implementing CBT, social skills interventions, exposure therapy, visual supports, and coping strategies in their clinical practice. Participants shared that they learned about the importance of collaboration with families, diagnostic procedures specifically for autism, community resources available, and suicide risk assessments.

Conclusions: Our findings highlight the success of ECHO Autism: Mental Health to deliver professional development to clinicians. This program has a potential to overcome the barriers and support clinicians in working with autistic clients who have co-occurring mental health conditions.

418.051 Effects of the October 7th Attacks and the Ensuing War on Autistic Children in Israel and Their Parents

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Background: The October 7th attacks, the ensuing war, and consequent upheaval in daily life in Israel present unique challenges to autistic children, who rely on routine and predictability. This is the first ever study of the experience of autistic children and their parents in the context of war.

Objectives: To assess the psychological effects of terrorism and ongoing war on autistic children and their parents

Methods: Study 1 is a one-year longitudinal study in which parent-report of child trauma (CATS) and parental negative emotional states (DASS) has been collected on autistic ($n=57$; 32 males; mean age = 7.02 years, $SD=3.7$) and non-autistic ($n=35$; 16 males; mean age = 7.12 years, $SD=3.65$) children every two months beginning October 2024. Data from an independent study before October 7th ($N=55$; 43 males; mean age = 4.5 years, $SD=1.02$) allowed for comparison of DASS scores across pre/post-war cohorts of autistic children.

Study 2 is a complementary cross-sectional, mixed-methods study ($n=72$). Parent-report measures and interviews assessed the above constructs as well as parental trauma (PCL-5) and parental resilience (BRS).

Results: In Study 1, parents of autistic and non-autistic children report trauma above the cut-off for PTSD, with autistic children ($M=34.7$, $SD=12.5$) scoring significantly higher than their non-autistic peers ($M=28.5$, $SD=9.95$), $t_{(75.43)} = 2.47$, $p < 0.05$, $d = 0.54$. Parents of autistic children reported elevated levels of stress ($t_{(df)} = x$; $p < 0.05$, $d=0.56$) and anxiety ($t_{(df)} = x$; $p < 0.001$, $d=0.84$) compared to parents of non-autistic children. Final analyses will be conducted in November 2025 upon completion of data collection. Parental negative emotional states in parents of autistic children were 2-4 times higher in the month following October 7th than in the independent, pre-war sample ($p < 0.001$, $d=2.62-2.77$).

In Study 2, parental trauma, together with higher anxiety levels, accounted for 43.8% of the explained variance of child trauma ($R^2 = 0.438$). Quantitative and qualitative analyses are ongoing.

Conclusions: Parent-reported levels of trauma in autistic and non-autistic children post-October 7th are strikingly high, as are negative emotional states in parents. Autistic children and their parents appear to experience more pronounced distress than that of their non-autistic peers. It is essential to consider these findings in supporting children and families affected by war.

418.052 Elevated Autistic Symptoms in Parkinson's Disease and Other Motor Disorders

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Background:

Parkinson's Disease (PD) is a motor disorder that primarily affects older adults. Recent biological and epidemiological evidence suggests significant comorbidity between PD and autism. Preliminary findings suggest that older autistic individuals are three times more likely to develop PD symptoms. However, the converse has not been directly studied, i.e., it is not known whether clinical PD is associated with greater autistic features. Additionally, it is unknown whether the putative overlap between autism and PD is exclusive to PD or extends to other, non-Parkinsonian motor disorders. Therefore, this preregistered study aimed to elucidate the degree and specificity of the relationship between autism and PD.

Objectives:

To test the specificity of the phenotypic overlap between autism and PD.

Methods:

Three groups of older adults were studied: a) people with the diagnosis of Parkinson's disease (N=110), b) people without any parkinsonism but with motor disability of neurological or neurovascular origin (OMD) (N=110), and c) typically ageing controls with no motor disorders (NT) (N=110). PD and OMD participants were recruited from the outpatient department of a tertiary neurology clinic, and all of their clinical diagnoses were verified by neurologists. N=330 age-matched participants were retained for the final analyses. All participants completed AQ-28 (as the pilot study revealed that AQ-50 was lengthy for the participants). Cognitive ability was measured using the Montreal Cognitive Assessment Scale (MoCA). The severity of PD symptoms was assessed using the Hoehn and Yahr scale. Additionally, participants also reported their sleep habits (items chosen from the Mayo Sleep Questionnaire (Boeve et al., 2011)) and a four-item questionnaire measuring GI symptoms (Hjortswang et al., 2006).

Results:

Both PD and OMD groups reported higher autistic traits compared to neurotypical controls, after accounting for differences in age and cognitive ability ($t(326) = -3.199, p = 0.002$, and $t(326) = -3.371, p < 0.001$, respectively) (Fig. 1). Exploratory analyses revealed a notable sex difference ($F(1, 315) = 5.0446, p = 0.025$): While autistic symptoms showed a group difference in males (PD males scoring highest), no such group differences were noted in females. This pattern of results was internally replicated across the three languages in which the instruments were administered (Bengali, Hindi, and English) and was not influenced by reporter identity (self or caregiver). No significant group differences were found in sleep and GI issues.

Conclusions:

The present study is the first attempt to examine the degree of overlap of autistic features in Parkinson's Disease. The findings suggest that this difference is not exclusive to PD but is also present in several other motor disorders of neurological and neurovascular origin, indicating elevated autistic traits across motor-related conditions. However, a notable sex disparity was observed, with males showing a clear difference in autistic features between the three diagnostic groups, and females showing no such group differences. This study supports the emerging view of overlap between autism and PD, and underscores the necessity of assessing autistic features in older adults diagnosed with PD or other motor disorders while planning support services.



418.054 Examining Influences of Autism Presentation on Parent-Child Agreement on Child's Anxiety

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Background:

Autistic and non-autistic children can report anxiety symptoms differently than their parents (Kalvin et al., 2020), suggesting that parents and children may interpret behavior differently (McMahon & Solomon, 2015). While previous literature has found consistent discrepancies in parent and child reports on psychosocial constructs (e.g., anxiety, social functioning; Lerner et al., 2012, McMahon & Solomon, 2015), there is a gap in the literature regarding how level of autistic traits may impact parent-child agreement in endorsing anxiety symptoms.

Objectives:

Examine whether parent-child agreement regarding anxiety symptomatology is moderated by the child's degree of autistic traits.

Methods:

A sample of autistic (n=43) and non-autistic (n=22) youth between the ages of 8 and 17 and their parents completed the *Multidimensional Anxiety Scale for Children, Second Edition (MASC-2; March, 2012)* and the *Anxiety Scale for Children-ASD (ASC-ASD; 2016)* self- and parent-report measures to assess anxiety symptomatology. While the MASC-2 is designed based on neurotypical anxiety symptomatology, the ASC-ASD, a newer measure, was specifically designed to capture anxiety symptomatology for autistic children (Wigham et al., 2016). Additionally, all youth were administered the *Autism Diagnostic Observation Schedule, Second Edition (ADOS-2; Lord et al., 2012)*. In this sample, the mean ADOS-2 comparison score (CS) was 5.6 (corresponding to a "moderate" degree of autism symptomatology; see Table 1 for mean anxiety scores). Using the SPSS PROCESS Macro (Hayes, 2022), a moderation analysis was run to examine how parent-child agreement differs with degree of autistic traits, with the ADOS-2 CS serving as a mean-centered moderator.

Results:

A paired-samples t-test showed significant difference between parent and child reports in mean anxiety symptomatology for both the MASC-2 and the ASC-ASD ($t(64)=-2.9, p=.006$ and $t(64)=-7.3, p<.001$ respectively), where children reported greater anxiety than their parents (see Table 1). Overall, a main effect of child-reported anxiety symptomatology in predicting parent-reported anxiety symptomatology was found for both MASC and ASC-ASD scores ($B_{MASC-2}=0.41, p_{MASC-2}=.005$ and $B_{ASC-ASD}=0.37, p_{ASC-ASD}<.001$). No main effect of autistic traits or interaction between child-reported anxiety symptomatology and autistic traits were found (all $p>.35$).

Conclusions: Overall, parent and child ratings of anxiety symptomatology in the current sample differed, wherein children reported their anxiety higher than their parents, but nonetheless child reports predicted parent ratings of their child's anxiety. Importantly, the child's level of autistic traits was not observed to influence this relationship within this sample of neurodiverse youth. Additionally, these results were found regardless of if the MASC-2 or ASD-ASC scores were used. These results suggest that, regardless of the child's potential social communication differences, autistic and non-autistic children may report anxiety symptoms higher than their parents, underscoring the importance



418.055 Experience of Outpatient Eating Disorder Treatments in Autistic Individuals and Integration of Co-Produced Research into Clinical Practice

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Background:

Autistic individuals are more likely to experience eating disorders (EDs) compared to neurotypical peers and between 20-40% of individuals with Anorexia Nervosa have higher levels of Autistic traits. These individuals report poorer experiences of ED treatment and are more likely to experience an inpatient admission for their ED (and for this admission to be longer). Concerns have been raised about existing outpatient ED treatments including eating disorder focused family therapy (FT-ED).

Objectives:

To explore clinicians, and families of Autistic individuals, experience of delivering or receiving FT-ED with associated adaptations

Methods:

FT-ED trained clinicians, and parents and carers and Autistic individuals, who had experience of receiving or delivering FT-ED with Autistic individuals were invited to take part in interviews. Transcripts were analysed using Reflexive Thematic Analysis.

Results:

Results will be presented separately for clinicians and parents and carers (still recruiting) Clinician only results are represented in this abstract. Eleven clinicians were interviewed from a range of clinical roles including Family Therapy (n=2), Nursing (n=5) and Clinical Psychology (n=4) (female n=9, 81%; Mean age 39.5 years, SD: 8.3, range 29–58 years; White British n=9, 81%). Analysis generated four themes and eight subthemes: (1) *Systemic context*, a theme which highlights systemic considerations beyond the young person as an individual, inclusive of three sub-themes highlighting **Neurodivergent parents and carers**, **Multiple Layers** of communication that take place within the family and therapeutic relationship, and the prior experience people bring of **Parenting an Autistic** child. (2) *Raising potential autism* refers to clinicians noting that most young people present to ED services without autism having been explored before and the pressure of contemplating an autism assessment at a point of heightened distress owing to the recent onset of the ED. (3) *Autism eating disorders crossover*, refers to the difficulties **Differentiating between Autism and Eating Disorders** when a young person is acutely starved; the **Agnostic Stance** of FT-ED and the risk of being blinkered to Autistic traits and the need for **Autistic Empowerment**, specifically the need for Autistic young people to take a more active and collaborative role in FT-ED (4) Finally in *Manual vs Adaptations*, clinicians described being caught between following the manual and developing adaptations for Autistic young people. They felt a **Tension between evidence practice and potential harm**, where they were concerned that deviating or rigidly following a manualised approach may both potentially cause harm. Clinicians who did adjust treatment described their **Autistic specific considerations**

Conclusions:

This is the first exploration of parents and clinician's experience delivering and receiving FT-ED with Autistic young people and their families and highlighted unique considerations with this population. It is an initial step to consider adaptations to the FT-ED model, with further interviews with Autistic young people with EDs planned next, with the aim of making ED treatments more effective, accessible and acceptable for Autistic young people and their families.

418.056 Experiences and Service Use of Families Whose Child Has Experienced Developmental Regression

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Background: Witnessing developmental regression—or skill loss—in a child can be traumatic. Caregivers who observe regression in their children report feelings of anxiety, stress, and family dysfunction, as well as sadness, loss, and confusion about the changes seen in their children. Compared to caregivers of children without regression, those reporting skill loss more often propose environmental factors (e.g., diet, pollution, vaccines) as causing their child's autism and express more guilt about the diagnosis. Collectively, these findings suggest that regression may negatively impact caregiver well-being and influence their views about autism and how they manage it (e.g., treatment). However, much of this literature is based on small samples without standardized tools to measure caregivers' mental and emotional experiences.

Objectives: To examine associations between caregiver report of regression in their children and their (1) perceptions about their child's autism, including causal attributions, and (2) adjustment to the autism diagnosis.

Methods: Participants were caregivers of individuals with autism recruited through the national SPARK study (www.sparkforautism.com) between 4/10/2019—6/18/2019 as part of a broader investigation of factors associated with parental vaccine hesitancy. Caregivers received an invitation via email to participate in a survey that included the *Illness Perception Questionnaire-Revised—ASD* version (IPQ-R; measure of cognitions about autism and causal attributions), *Family Adjustment Measure* (FAM; measure of adjustment to the autism diagnosis), and items about skill loss. All data were collected electronically through SPARK's Research Match platform. Descriptive and inferential statistics were used to characterize the sample and identify potential differences between those with and without reported skill loss.

Results: Overall, 39,461 SPARK caregivers were invited to participate and 8,389 enrolled (response rate = 21.3%). 3,536/8,389 (42.2%) reported regression in language ($n=2,787/3,536$, 78.8%) social skills ($n=2,103/3,536$, 59.5%), or other skills ($n=1,497/3,536$, 42.3%); 483/8,389 (5.8%) were unsure if their child had regressed. Based on the IPQ-R-ASD subscales, those witnessing regression perceived their child's autism as having more negative consequences, being difficult to understand, eliciting more negative feelings, being a chronic condition, and associating with a higher number of symptoms compared to caregivers whose children did not lose skills. Likewise, they reported greater levels of parental distress and lower levels of family-based and social support in their adjustment to their child's diagnosis per the FAM. With respect to beliefs about causes of autism, caregivers reporting regression and those who were unsure about skill loss (a) more frequently endorsed their own personal attributions and environmental factors and (b) less frequently endorsed biophysiological factors as causal. Most effects were small to medium. Detailed results are in Table 1. Results were broadly similar for caregivers of male versus female autistic children.

Conclusions: Caregivers observing regression in their children with autism reported poorer mental and emotional health outcomes compared to those not reporting regression. They were also more likely to blame their own actions and environmental mechanisms as causing autism. Clinicians should consider the implications of regression on caregiver and family well-being and offer supports when indicated.

**418.057** Exploring Interpersonal Physiological Synchrony during Mealtime Among Young Autistic Children

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Background: Autistic children are 5-15x more likely to have eating problems when compared to non-autistic children (Sharp et al., 2013). Food intake is a basic need, and extreme food selectivity observed in autistic children leads to significant parental anxiety and family burden.

Longstanding research in pediatric eating behavior recognizes the importance of parent-child interactions at mealtime, and recent studies link observed parent behaviors to increased child food refusal (controlling prompts) or increased food acceptance (supportive prompts; Fries et al., 2017). One novel area to measure bidirectional mealtime interactions is interpersonal autonomic physiology (PS). PS occurs when autonomic nervous system activity “matches” between two interacting partners, and many foundational studies on child attachment find that strong parent-child relationships are linked to greater PS (Palumbo et al., 2017). However, emerging research indicates autistic children show less PS with their parents (McNaughton & Redcay, 2022). PS demonstrates promise as a marker for social interaction quality, but has yet to be used in autism to uncover how parent-child interactions may relate to challenging eating behaviors.

Objectives: The purpose of this study is to preliminarily examine the strength of relationship between parent-child electrodermal activity (EDA), a measure of sympathetic nervous system arousal, during mealtime in autistic and non-autistic children.

Methods: We collected family mealtime in the home with 8 age-matched parent-child dyads (4 with an autistic child and 4 with a TD child).

Children were between 3-9 years of age (autistic: $M= 67.25$, $SD= 26.80$; non-autistic: $M= 77.00$; $SD= 11.78$ months) and autistic children were parent-reported picky eaters and non-autistic children were not picky eaters. During mealtime observations, both the parent and child wore an E4 Empatica biosensor on their wrist to capture EDA, and time-synchronized video was captured using a GoPro camera. As a preliminary investigation we ran bivariate correlations between parent-child dyad EDA levels at mealtime.

Results: Our sample primarily included male children (75% male in the autism group and 100% male in the non-autistic group). Preliminary bivariate correlations between the EDA for an autistic child and his or her caregiver across one mealtime showed on average no relationship ($M=0.05$; $SD=0.41$) compared to the non-autistic group that showed on average a weak positive relationship ($M=0.32$; $SD=0.46$).

Conclusions: PS provides a potential novel way to quantify the bidirectional behaviors observed during parent-child interactions at mealtime. While our results are preliminary and with a small sample (additional data will be analyzed prior to the conference), it appears that PS can yield different patterns of correlations during mealtime for autistic (no relationship in EDA values between the parent and child) compared to non-autistic children (weak positive relationship in EDA values between the parent and child). Our future analyses prior to the conference will use more robust statistics (i.e., wavelet coherence analysis, granger causality analysis) and overlay behavioral mealtime to parent-child EDA levels to determine micro-level behaviors at mealtime that support PS.

418.058 Exploring the Association between Sensory Processing Disorders and Co-Occurring Physical, Mental and Neurodevelopmental Conditions in Autistic Adults

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Background:

The increasing body of research on sensory differences in the ASD population since their introduction in the diagnostic features of ASD in the DMS-V, is mainly focused on children and on their association with autism traits or behaviors. But sensory processing disorders (SPD) can impact health beyond autistic symptoms.

The extend of the co-occurrence of SPD with other health conditions has been seldomly studied in the ASD population despite an association found in the general adult population. The goal of the study was to explore the comorbidity burden of autistic adults with and without SPD and assess the correlations between SPD and several mental, neurodevelopmental and physical health comorbidities.

Objectives:

- 1) Estimate the prevalence of sensory processing disorders in a sample of autistic adults
- 2) Evaluate the difference in the number and type of comorbidities between the groups with and without SPD

Methods:

A total of 164 autistic adults or their caregivers filled a survey asking for self-reported co-diagnoses of 34 mental, neurodevelopmental and physical health conditions. Among them, 13 conditions had a prevalence of more than 5% in the sample and were included in the analyses. T-test was used for comparisons between SPD and non-SPD groups. We performed tetrachoric correlations to assess the correlation between presence/absence of SPD and the 13 comorbidities.

Results:

The prevalence of reported SPD in our sample was 37% (n=91). There was no difference in gender and age between the groups with and without SPD (Table 1). Participants with SPD had an average of 5 comorbidities (SD=3.1), which was significantly higher than the number of comorbidities in adults without SPD (mean=2, SD=1.8). Individuals with SPD had twice the number of mental, physical, and neurodevelopmental conditions than those without SPD (Table 1). Moreover, the group with SPD perceived more barriers to healthcare than the group without SPD (55.7 and 34.0%, respectively).

Presence of SPD was strongly correlated with presence of eating disorder, auditory disorder, gastrointestinal disorder, learning disorder, musculoskeletal disorder, and body-focus and repetitive behaviors disorder (Table 2).

Conclusions:

Despite being the second most prevalent co-occurring condition in our sample, SPD were reported by only two third of adults (compared with 90-95% in autistic children), which is consistent with other lower estimates in adults, suggesting an adaptive or maturation process over time.

Nonetheless, autistic adults that do present with SPD form a sub-population with highly complex health needs.

Except for depression, OCD, epilepsy and vision disorders, all conditions were either moderately or strongly associated with SPD. Our findings align with previous studies on autistic children or on other psychiatric, neurodevelopmental, or physical conditions populations, linking sensory processing dysfunction with hyperactivity, distractibility, feeding disorders, gastrointestinal issues, musculoskeletal disorders, anxiety, and repetitive and compulsive behaviors.

Future studies assessing the association between specific sensory modalities, or their combinations (vestibular, proprioceptive, and somatosensory, tactile) with each of those conditions could unravel convergent biological pathways and lead to new therapeutic option developments that could help decrease the barriers to healthcare experienced by those adults and improve their overall health.



418.059 Exploring the Cognitive and Neurodevelopmental Difficulties within Adolescents and Young Adults with Early Onset Liver Disease

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Background: The impact of a lifelong chronic condition is rarely restricted to one organ, even more so when organ dysfunction occurs at a time when the brain is most vulnerable to environmental insult, such as the neonatal period. For instance, Biliary Atresia (BA) is an early-onset, inflammatory chronic liver disease that requires immediate intervention surgery (Kasai) and is a common indication for paediatric liver transplantation (LT). Whereas neurocognitive delay is prevalent in this population (Rodijk et al, 2021; Ng et al, 2018; Ruuska et al, 2021), the frequency of neurodevelopmental difficulties has not yet been explored.

Objectives: In the most in-depth study of its kind, we aimed to identify clinically significant cognitive impairments and traits of neurodevelopmental conditions including autism and attention-deficit hyper-activity behaviours (ADHD), in a population of adolescents and young adults with BA. Furthermore, we sought to understand if age at Kasai and/or LT influenced neurodevelopmental outcomes.

Methods: 45 participants with BA (29 female, 15 male, 1 transgender) aged 11-24 years ($M=17.72$, $SD: 3.65$) enrolled into this study. Two thirds (20 female, 10 male) underwent a LT at a mean age of 4.4 years ($SD: 5.25$ years), and out of 15 surviving with their native liver (9 female, 5 male, 1 transgender), 3 were on the waiting list for a LT (2 female, 1 male). Subjects completed a Wechsler Abbreviated Scale of Intelligence (WASI-II) to measure Full-Scale-4, an Autism Diagnostic Observation Schedule – 2 (ADOS-2 Module 3/4), and an Attention and Activity Levels questionnaire to screen for ADHD behaviours.

Results: Full-Scale 4 IQ composite score was significantly lower in the BA cohort compared to the average norm (BA $M: 95.89$, $SD: 16.18$, $p = .048$), and 12 (27%) scored below normal range.

Prior to participation, 3 had a diagnosis of autism, and 5 were either diagnosed with ADHD or referred for an ADHD assessment (17.78%). From the remaining, 12 (28.6%; 9 female, 3 male) participants scored above the threshold on the ADOS-2 [mean ADOS-2 score of 5.79 ($SD: 4.59$)], and 25 (62.5%; 18 female, 7 male) on the ADHD screening tool. Seven (4 male, 3 female) scored above threshold for both.

Whilst LT was associated with lower Full-Scale 4 IQ scores compared to the patients surviving with their native liver (LT $M: 92.03$, Native $M: 106.5$, $p = .004$), no differences were found for ADOS-2 scores (LT $M: 6.36$, Native $M: 4.64$, $p = .129$) nor likelihood of scoring over threshold on the ADHD screening tool ($p = .517$). Neither age at Kasai nor age at transplantation significantly correlated with IQ scores (Kasai $r = -.098$, LT $r = .114$) nor ADOS-2 scores (Kasai $r = -.307$, LT $r = .139$).

Conclusions: Adolescents and young adults with an early onset liver condition have a higher likelihood of neurodevelopmental difficulties regardless of disease progression, including age at Kasai and/or liver transplantation, and with an equal gender distribution. Considering the impact on clinical outcomes and every-day functioning, focus should shift towards early screening and signposting to specialist services.

418.060 Exploring the Relationship between Cognitive Flexibility and Anxiety in Autistic Youth

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Background: Anxiety is the most common mental health problem in autistic youth, with over 80% of autistic youth experiencing impairing anxiety symptoms (White et al., 2009). However, anxiety symptoms are frequently overlooked due to “atypical” presentations in autism, and even when detected, often not effectively treated, due to a lack of conceptual understanding of autistic cognition (Kerns et al., 2014; Wood & Gadow, 2010). Emerging literature has suggested that individual differences in cognitive flexibility (CF) among autistic youth may contribute to unique strengths, as well as greater mental health challenges, relative to allistic peers (Geurts et al., 2009; Stark et al., 2021). Better understanding of autistic CF differences may help elucidate mechanisms of anxiety vulnerability and beneficial targets of anxiety treatment for autistic youth.

Objectives: The current study utilized a multi-method approach to measuring CF, given its complexity as a multifaceted construct, in order to tease apart the relationship between CF and anxiety. We also used an autism-specific scale for measuring anxiety from both parent and child perspectives in order to capture the unique anxiety symptomatology experienced by autistic youth in relation to difficulties with flexible thinking.

Methods: Participants included forty 8–17-year-old autistic children (11 female; autism classification based on the ADOS-2; Lord et al., 2012), along with their parents (37 mothers). Over 40% of participant families identified with minoritized racial backgrounds (e.g., 17.5% Asian, 12.5% Black), and 15% of families identified as Hispanic/Latinx. Parents reported on their children’s real-world flexibility difficulties (Flexibility Scale; Strang et al., 2017), anxiety symptoms (ASC-ASD-P; Rodgers et al., 2016), and autistic traits (SRS-2; Constantino & Gruber, 2012). Children reported on their own real-world flexibility difficulties (BRIEF-SR Shift subscale; Gioia et al., 2000) and anxiety symptoms (ASC-ASD-C; Rodgers et al., 2016). Lab-based task switching measures were also administered to children (D-KEFS Trail Making, Verbal Fluency, and Color-Word Interference; Delis et al., 2001). Bivariate relationships between CF scores and anxiety scores were examined via Pearson’s correlations and linear regression analyses. Predictors in the regression models were determined by significant Pearson’s correlations, and outcome variables were self- and parent-reported anxiety.

Results: Pearson’s correlations revealed that lab-based task switching scores were not significantly associated with self-rated anxiety. On the other hand, number-letter switching performance was a significant unique predictor of parent-rated anxiety, according to linear regression analysis. In addition, real-world flexibility challenges were significant predictors of greater self- and parent-rated anxiety, while accounting for autistic traits.

Conclusions: Our findings are consistent with current literature suggesting the role of real-world flexibility challenges in anxiety vulnerability in autistic people. The current study also offers preliminary support for the distinction between real-world CF and lab-based CF with regards to their relations with anxiety among autistic youth. In addition, our findings suggest the utility of asking autistic youth, as well as their parents, about their own flexibility difficulties in daily life as a means of assessing anxiety risk. Findings may help inform targeted assessment and treatment approaches for this vulnerable population.



418.061 Exploring the Role of Race and Ethnicity on Depressive Symptoms in Autistic Adolescents

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Background: Many autistic adolescents face significant social and mental health challenges (Lai et al., 2019), and evidence shows racial disparities in access to healthcare and specialized services for autistic people of color (POC; Eilenberg et al., 2019). As such, minoritized autistic adults are likely underdiagnosed for mental health conditions (Ames et al., 2021). Research indicates that autistic adolescents have more depressive symptoms than those with other developmental disabilities (Wiggins et al., 2024), yet significant differences between White and POC autistic adolescents remain largely unexplored. In one small study of transition-age young adults ($N = 39$; 16-26 years old), Black autistic young people endorsed significantly higher rates of depressive symptoms than their White autistic peers (Williams et al., 2021). However, it is unknown if this pattern of results extends to adolescence, a critical period of development for autistic youth (Picci & Scherf, 2015), or more broadly to autistic young people of color, who may face additional barriers from systemic inequities and racial discrimination, exacerbating mental health issues (English et al., 2014). Addressing these gaps can inform culturally competent mental health services and promote equitable support for autistic youth from diverse backgrounds.

Objectives: This study explored whether differences in depressive symptoms exist between autistic adolescents of color as compared to autistic White adolescents in a treatment-seeking sample. We hypothesized significant group differences in depressive symptoms between POC and White autistic adolescents, extending prior literature.

Methods: Participants included 134 adolescents with pre-existing autism diagnoses (73.9% male; $M_{age} = 14.1$, $SD = 1.94$). Of these, 41.5% ($n = 56$) identified as persons of color, while 58.5% ($n = 79$) identified as White and 38.6% ($n = 51$) were in general education public schools. Additionally, 82.2% ($n = 106$) of parents had at least a bachelor's degree or above. Depressive symptoms were measured using the Children's Depression Inventory, 2nd Edition (CDI-2; Kovacs, 2012) at baseline. Independent samples t-tests were conducted to compare depressive symptom scores between White participants and participants of color. Descriptive statistics and effect sizes were calculated to examine the magnitude of group differences.

Results: Independent samples t-tests revealed no significant differences in depressive symptoms between White autistic teens ($M = 59.51$, $SD = 12.97$) and autistic teens of color ($M = 59.60$, $SD = 14.00$), $t(129) = -0.04$, $p > .05$, $d = -0.006$. Thus, depressive symptom scores were comparable across White and POC autistic teens.

Conclusions: Findings suggest no significant differences in depressive symptoms between POC and White autistic adolescents in this treatment-seeking sample. These results may indicate that depressive symptoms present similarly across racial and ethnic groups in autistic adolescents. Alternatively, this sample may reflect outcomes for highly educated families of color who were able to access specialized services for their autistic teens, despite existing disparities. Future research is warranted to better identify the mental health needs of this multiply marginalized population. A focus on systemic methods to address disparities in service access may also be explored to reduce mental health burden and ensure equity in support for autistic youth.

418.062 Gender Predicts Rates of Co-Occurring Psychiatric Conditions and Symptoms in Autistic Youth

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Background: Autistic individuals have elevated rates of co-occurring psychiatric conditions compared to neurotypical individuals. Some studies have explored and found differences by gender/assigned sex, with elevated psychiatric symptoms in cisgender females relative to males (e.g., Magiati et al., 2016; Rødgaard et al., 2021). The limited work across the gender spectrum has found cisgender females and gender diverse autistic adults report higher co-occurring psychiatric symptoms (Sedgewick et al., 2020). Additional research is needed to evaluate gender-based differences in the mental health of autistic youth, particularly leveraging multiple data sources.

Objectives: The present study sought to investigate the hypothesis that among autistic youth, rates of clinician-diagnosed co-occurring psychiatric conditions, as well as parent-reported and self-reported psychiatric symptoms would be elevated in cisgender girls and gender diverse youth. Additionally, an exploratory hypothesis was explored that self-reported symptoms would better predict clinician diagnosis than parent-reported symptoms.

Methods: Participants were drawn from a sample of >9,000 individuals seen for psychological or neuropsychological evaluation at an outpatient clinic at an academic medical center in the Washington, DC metropolitan area. A final sample was identified ($N=472$; ages 11-18) who received a primary diagnosis of autism from an expert clinician and had parent and self-report data available on psychiatric symptoms on the Child Behavior Checklist/Youth Self-Report (Achenbach & Rescorla, 2001). Chi-square analyses with follow-up pairwise z-tests were used to assess differences in co-occurring conditions by gender, using clinician-reported clinical diagnosis. One-way ANOVA was used to assess differences in psychiatric symptoms by gender. Logistic regression was used to assess likelihood of co-occurring diagnoses based on age, gender, and parent-reported and self-reported symptoms.

Results: Chi-square analyses revealed that rates of depression differed significantly by gender ($\chi^2=15.374$, $p<.001$), with post-hoc tests indicating such that depression was significantly higher among gender diverse youth than cisgender females and cisgender males. Anxiety also differed significantly by gender ($\chi^2=7.281$, $p=.026$), though post-hoc tests were not significant. PTSD rates did not differ significantly by gender ($\chi^2=2.767$, $p=.251$). Symptoms of anxiety, depression, and post-traumatic stress differed significantly by gender on both parent and self-report (Table 2), with gender diverse youth showing significantly higher symptoms than both cisgender males and females across measures on post-hoc testing, after applying Bonferroni correction. Logistic regression analyses showed that clinical diagnosis of depression was predicted most strongly by parent [(exp)B=1.055, $p<.001$] and self report [(exp)B=1.058, $p<.001$], as was diagnosis of anxiety [parent: (exp)B=1.067, $p<.001$] [self: (exp)B=1.029, $p=.010$]. No hypothesized predictor reached independent significance for predicting diagnosis of PTSD.

Conclusions: Findings generally supported our hypotheses that gender diverse youth would show the highest rates of co-occurring psychiatric conditions and symptoms. Though there was a trend for cisgender girls to show higher rates than cisgender males as well, these findings did not reach statistical significance. Further research is needed to elucidate the factors that make gender diverse autistic youth more susceptible to co-occurring psychiatric distress.



418.063 Genetic, Environmental, and Stochastic Contributions to Social Impairment and Sleep Problems

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Background: Sleep problems affect between 50-80% of autistic youth; however, the relationship between ASD and sleep disorders remains poorly understood. Twin models are valuable tools for disentangling the genetic and environmental contributions to complex psychiatric conditions like ASD. Specifically, the bivariate ACE model leverages phenotypic correlations between monozygotic (MZ) and dizygotic (DZ) twins to estimate the proportion of phenotypic covariance attributed to additive genetic (A), common/shared environmental (C), and unique/nonshared environmental (E) factors.

Objectives: This study used ACE modeling to investigate the genetic, shared environmental, and nonshared environmental contributions to the phenotypic covariance between social impairment and sleep disorders. Understanding the genetic and environmental factors underlying this shared heritability may inform targeted treatments for autistic youth experiencing sleep disturbances.

Methods: Data were collected remotely from 684 families in the Mid-Atlantic Twin Registry with twins ($n = 578$ MZ pairs, $n = 762$ DZ pairs, $n = 698$ males, $n = 670$ females) between 6 and 17 years of age. Social impairment and sleep problems were assessed using two parent-proxy instruments, the Social Responsiveness Scale, Second Edition (SRS-2), and the Sleep Disturbance Scale for Children (SDSC). Correlations between ASD traits and sleep disturbances were computed for both MZ and DZ twin pairs, followed by bivariate ACE modeling using OpenMx. Given the well-established sex differences in ASD, separate models were estimated for males and females.

Results: Within-trait analyses showed a positive association between social impairment and sleep problems, with stronger relationships observed in MZ twins compared to DZ twins. ($r_{MZfSRS} = 0.67$, $r_{DZfSRS} = 0.44$, $r_{MZmSRS} = 0.80$, $r_{DZmSRS} = 0.34$, $r_{MZfSDSC} = 0.84$, $r_{DZfSDSC} = 0.32$, $r_{MZmSDSC} = 0.75$, $r_{DZmSDSC} = 0.53$). Nearly all of the phenotypic covariance between social impairment and sleep disturbances was explained by shared environmental influences ($C_m = 0.95$ (0.26, 1.7), $C_f = 0.98$ (0.32, 1.65)), with negligible contributions from genetic ($A_m = -0.15$ (-0.90, 0.57), $A_f = -0.13$ (-0.84, 0.56)) and nonshared environmental influences ($E_m = 0.19$ (0.08, 0.33), $E_f = 0.14$ (0.03, 0.28)).

Conclusions: While both ASD and sleep disorders show strong genetic influence and high heritability, our finding that the phenotypic covariance between social impairment and sleep disturbance is primarily driven by shared environmental factors suggests limited genetic overlap between the two conditions. These results highlight the substantial impact of environmental influences on the interaction between social impairment and sleep, suggesting that behavioral interventions may be particularly effective for improving sleep problems in autistic children.

418.064 Get to Class: The Role of Internalizing Conditions on School Absenteeism for Autistic Youth

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Background: Non-autistic students with anxiety and depression miss more school days than their peers (Askeland et al., 2020; Lawrence et al., 2019). Compared to their non-autistic contemporaries, autistic youth experience higher rates of anxiety and depression (Bougard et al., 2021; Hudson et al., 2019) and have higher rates of school absenteeism (Nordin et al., 2024). Though there is evidence that autistic children may be absent from school more often due to school refusal, school exclusion or withdrawal, and non-problematic absenteeism (Totsika et al., 2020), there is still a need to examine how experiencing anxiety and depression may impact an autistic student's school attendance to identify mental health intervention targets designed to improve school attendance for autistic youth.

Objectives: This study examined whether internalizing mental health conditions (i.e., anxiety and depression) were significantly associated with school absenteeism for autistic children and adolescents.

Methods: Caregiver-reported data from the 2022 National Survey of Children's Health (NSCH) was used to examine the relationship between internalizing conditions and school absence in autistic youth. 1382 autistic youth (75.47% male) ages of 6 to 17 ($M = 11.78$, $SD = 3.50$) were included in the analysis. School absenteeism was measured on a scale of 0 to 4 where higher numbers represent more days of school missed (e.g., 0 = no missed school days, 1 = 1-3 days, etc.). Internalizing conditions were operationalized via a composite variable that captures the presence and potential co-occurrence of depression and anxiety. The absence of either condition was assigned a code of 0; the presence of anxiety *or* depression was assigned a code of 1; the presence of both anxiety *and* depression was assigned a code of 2. Socioeconomic status was measured via a proxy variable assessing whether the student received any free and/or reduced meals from their school. Controlling for age, sex, challenging behaviors, socioeconomic status (SES), adverse child experiences (ACEs) and intellectual disability we conducted ordinary-least squares regression (OLS) with internalizing conditions as a predictor of school absenteeism.

Results: Overall results indicated statistically significant differences in mean school absenteeism, $F(7,1327) = 12.67$, $p < .001$, $R^2 = .06$. Controlling for age, sex, challenging behaviors, socioeconomic status, ACEs and intellectual disability, we found that internalizing conditions significantly predicted increases in school absenteeism for autistic youth, $t(1327) = 6.29$, $p < .001$, $d = 0.18$.

Conclusions: Increased internalizing disorders are associated with more school absenteeism for autistic youth, even when controlling for common reasons that autistic children miss school. Importantly, school absenteeism is identified as a risk factor for mental health challenges for non-autistic youth (Epstein et al., 2020), indicating that the relationship between mental health challenges and school absenteeism are interrelated. This could also be the case for autistic youth, which begs further research on this topic. There is a need for mental health intervention for autistic youth experiencing internalizing symptoms to prevent worsening of these conditions and resulting school absenteeism. These results support the importance of adequate and timely mental health services for autistic youth to mitigate school absence.

418.065 What Helps Autistic Adults Have 'Good' Sleep? – Data-Prompted Interviews Exploring the Sleep Behaviours, Physical Activity and Affect Variability.

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Background: Sleep is a critical part of daily living for the benefit of the health and wellbeing of individuals. Inadequate sleep and untreated sleep disorders may be detrimental to physical health, mental health, mood, and public safety. Sleep problems are reported in 50-80% of autistic people compared to 25-30% of non-autistic individuals. However, understanding the factors that facilitate or hinder 'good' sleep among autistic adults is underexplored. Furthermore, sleep can be considered as a behaviour, which influences the activities and individuals' affect. If sleep is considered a behaviour, it is adaptable to enable optimal sleep as perceived by autistic individuals.

Objectives: This study aimed to explore the experience of sleep by eliciting rich responses through the perspectives of autistic adults.

Methods: Data-prompted interviews (DPIs) were conducted with eight autistic adults to explore participants' experiences and perspectives of sleep behaviours. Prior to the interviews, participants completed a 10-day ecological momentary assessment (EMA) that tracked their sleep behaviours, physical activity and emotional states. In this same 10-day period, device-derived measurements of sleep were obtained using the Withings Sleep Analyzer and ActiGraph GT9X. The ActiGraph GT9X collected device-derived measurements of physical activity. The DPIs were guided by participant's data from the 10-day EMA period. The verbatim transcripts from the DPIs were analysed using reflexive thematic analysis.

Results: The analysis identified five themes. Theme one, *individual bedtime routine*: each person had a routine that led to bedtime and sleep onset. Theme two, *the next day's activities influenced sleep routine engagement*: the importance of leisure or productive activities the next day motivated individuals to engage in their sleep routine and aim to sleep adequately. Theme three, *self-awareness of perceived sleep quality influencing affect*: individuals reported a direct relationship between what felt like "enough sleep" and feeling positive emotions, and the inverse was true. Theme four, *sleep is a task*: a task-oriented approach to perceiving and achieving adequate sleep in daily living. Theme five, *'good' sleep is important and beneficial*: the importance and benefits of 'good' sleep are identified for physical and mental health. However, the perceived depth of benefits varied.

Conclusions: The findings suggest that individualised bedtime routines and motivation towards meaningful activities the following day are factors that promote 'good' sleep routines and behaviours in autistic adults. Furthermore, the association between emotional states and participation in activities were motivators to achieve adequate sleep quantities and establish sleep regularity. Autistic adults identified that objective, device-derived data of sleep behaviours, PA and affect from a 10-day EMA were an accurate representation of daily living. This study emphasises the need to identify routines and activity goals that suit individuals' preferences. This may facilitate motivation and engagement in behaviours to achieve 'good' sleep.

418.066 Heterogeneous Longitudinal Trajectories of Psychotropic Polypharmacy and Aggressive Behaviour in Children with Neurodevelopmental Conditions

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Background: Autism and intellectual disability (ID) are prevalent neurodevelopmental conditions associated with high rates of psychotropic polypharmacy—defined as the concurrent use of multiple psychotropic medications. Psychotropic medications are frequently prescribed in neurodevelopmental conditions to address mental health symptoms and/or challenging behaviours, such as aggression, which have not responded to psychosocial interventions.

Objectives: The objectives of this study were: 1) to identify heterogeneous longitudinal trajectories of psychotropic polypharmacy and aggression frequency in a cohort of children diagnosed with ID and/or autism; 2) to describe clinical correlates of polypharmacy and high-frequency aggression in this population; and 3) assess the relationship between polypharmacy trajectories and aggressive behaviour over time.

Methods: Data were derived from the longitudinal electronic health records of children/youth diagnosed with ID or autism receiving medication management for treatment-refractory behavioral and psychiatric symptoms through a large multidisciplinary tertiary psychopharmacology program between 2019 and 2022. Group-based trajectory modeling was employed to identify patient subgroups with distinct longitudinal trajectories over 3 years. Psychotropic polypharmacy was recorded as the count of psychotropic medications at each visit, while aggression frequency was assessed on a 5-point incremental scale ranging from no occurrences to multiple occurrences daily. Demographic and clinical correlates across participants were examined by their highest probability group membership using standard descriptive statistics (Fisher's exact test and χ^2 test).

Results: A total of 281 children/youth (mean age 10.4 SD 2.91) were seen for a mean of 7 visits over 3 years. We identified six distinct longitudinal trajectories of psychotropic polypharmacy, comprising two low concern low polypharmacy trajectories: less than 1 medication-stable (10.7%) and 1 medication increasing (33.5%); two moderate polypharmacy trajectories: 2 medications-stable (30.6%) and 1-2 medications-increasing (8.5%); and two high polypharmacy trajectories: 3 medications-increasing (13.5%) and 4 medications-increasing (3.2%). Children assigned to higher polypharmacy trajectories tended to be older, had higher rates of irritability, side effects, crisis events and were more likely to be taking a sleep-aid/sedative-hypnotic. We identified 5 distinct aggression trajectories: no aggression (27.5%), low-frequency aggression (11.5%), moderate aggression decreasing (33.0%), moderate aggression resolving (16.0%), and high aggression decreasing (12.0%). Children assigned to the high-aggression group were more likely to experience parent burnout, irritability, crisis service use and were more likely to have been diagnosed with an intellectual disability. Polypharmacy trajectory group membership was not significantly associated with aggression trajectory group membership.

Conclusions: For children with neurodevelopmental conditions receiving psychotropic medication management through a large tertiary care program, polypharmacy tended to be stable or increasing over time, while most children experienced a reduction in or resolution of aggressive behaviour. Results emphasize the complexity and chronicity of psychotropic polypharmacy, and further underscore the importance of research on irritability in neurodevelopmental conditions as well as pathways towards psychiatric deprescribing.



418.067 How Are Self-Regulation Difficulties Linked to Neurodevelopmental Conditions? an Umbrella Review to Enhance Conceptual and Measurement Clarity

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Background: Individuals with neurodevelopmental conditions (NDCs) such as autism, attention-deficit/hyperactivity disorder (ADHD), and intellectual disabilities often experience struggles to regulate emotion and cognition, impacting their abilities to adapt behaviors to internal and external demands. These self-regulation difficulties (i.e., dysregulation) may be transdiagnostic across NDCs. However, the existing literature is heterogeneous. This inconsistency underscores a pressing need to clarify the conceptualization and measurement of dysregulation in individuals with NDCs. Further, it is crucial to determine whether these definitions and associated challenges are consistent across neurodivergent populations, or if they manifest uniquely within specific groups.

Objectives: We conducted a pre-registered umbrella review to systematically examine the published narrative reviews, systematic reviews (SRs), and meta-analyses (MAs) that address the construct, measurement, and other mechanistic and clinical relevance of self-regulation in populations clinically diagnosed with NDCs.

Methods: We pre-registered the overarching umbrella review in PROSPERO (CRD42023350582). We searched Medline, PsycINFO, Embase, Web of Science, Cochrane Central Register of Controlled Trials, and Cochrane Database of Systematic Reviews by September 5th, 2024. Of 18,821 unique citations, we included 49 narrative reviews, scoping reviews, SRs, and SRMAs. We (i)summarized the review characteristics, (ii)synthesized the definitions and constructs used to describe self-regulation, and (iii)quantified the self-regulation measures used in the primary empirical studies captured in the included SRs and MAs. We also conducted risk of bias assessments of included SRMAs through the Joanna Briggs Institute checklist.

Results: (i)We included 35 narrative reviews, 9 SRs, 2 scoping reviews, and 3 SRMAs, covering dysregulation in autism (11), ADHD (24), intellectual disabilities (5), OCD (2), and transdiagnostically (7). (ii)Self-regulation difficulties were consistently defined as a transdiagnostic phenomenon, and linked to temperamental traits in early development, social cognition, executive functions, motivation, language, and irritability. Reviews also highlighted the physiological bases, developmental pathways, temporal course, and co-regulation through caregivers, as well as distinctions between implicit and explicit self-regulation and diverse self-regulation strategies (e.g., reappraisal, suppression, acceptance). Finally, some reviews defined dysregulation as a core feature of ADHD, autism, and ID. (iii)Across 366 primary empirical studies (193 from the United States, 257 published after 2009, 126 using more than one self-regulation measure), we identified 567 self-regulation measures, most frequently questionnaires (412), followed by emotion tasks (74), cognitive tasks (50), and behavioral observation (31). For questionnaires, parent-report alone were the most common method of assessment (225), followed by self-report (128), parent- and teacher-report (26), clinician-report (12), teacher-report (9), and parent and self-report (7), with 5 additional studies not specifying who responded to the questionnaire. The six most commonly used self-regulation questionnaires across NDCs were the Child Behavior Checklist (CBCL), Aberrant Behavior Checklist (ABC), Behavior Rating Inventory of Executive Function (BRIEF), Difficulties in Emotion Regulation Scale (DERS), Conner's Rating Scale (CRS), and Emotion Regulation Checklist (ERC). The questionnaires that were most used in autism, ADHD, OCD, and ID studies were the ERC, the CRS, the DERS, and the ABC, respectively.

Conclusions: This work creates a roadmap for future research to define and operationalize self-regulation and understand its transdiagnostic nature across autism and related NDCs.

**418.068** Hypermobility in Children with Autism and Attention Deficit Hyperactivity Disorder

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Background: Autism spectrum disorder (autism) and attention deficit/hyperactivity disorder (ADHD) are two common neurodevelopmental conditions that emerge in early childhood, with growing interest in their co-occurrence with medical conditions like hypermobility. Most research on hypermobility in autism and ADHD has focused on hypermobile Ehlers-Danlos syndrome, particularly in adults, and explored the prevalence of autism and ADHD within that population. A potential connection between immune-related issues, hypermobility, autism, and ADHD has been suggested, but few studies have examined hypermobility prevalence in children with autism or ADHD, or its relationship to immune history. Currently, no best practice protocols exist for identifying and managing hypermobility in these children, due clinical prioritisation of other symptoms, and the diversity of healthcare professionals involved in diagnosis and care.

Objectives: This study examined the prevalence of hypermobility among a paediatric sample of neurotypical and autistic and/or ADHD children, and possible immune-related predictors of hypermobility symptomology.

Methods: Participants were children aged 4-18, recruited through the Monash Autism-ADHD Genetics and Neurodevelopment (MAGNET) project. Children were recruited to the study if they had a diagnosis of autism and/or ADHD, alongside a neurotypical comparison group. Joint hypermobility in all participants was assessed using the Beighton Scoring System at the time of assessment. Localized joint hypermobility was defined as a score of 3 or less on the 9-point Beighton Score Scale and Generalised Joint Hypermobility was defined as a score of 4 or more on the 9-point Beighton Score Scale (BSS). The BSS uses a nine-point evaluation of four bilateral and one unilateral joint, with each joint identified with hypermobility being counted as 1 point; a total score can range from 0 to 9. Spearman's rank correlations were computed to assess the relationship between hypermobility and immune-related issues, adaptive functioning and quality of life.

Results: The sample consisted of 400 children (male: 57%, females: 43%); $n=63$ autistic, $n=67$ ADHD, $n=157$ autism+ADHD, $n=113$ neurotypical children. There was no group difference in the prevalence of localised joint hypermobility (autism 69.8%; ADHD 81.8%; autism+ADHD 72.6%; neurotypical 76.1%) or generalised joint hypermobility (autism 30.2%; ADHD 18.2%; autism+ADHD 27.4%; neurotypical 23.9%). There were no statistically significant relationships between hypermobility and immune-related issues ($r(398) = .05, p = .34$), adaptive functioning ($r(393) = -.02, p = .64$) or quality of life in the total sample.

Conclusions: Our study emphasises the need for early detection of hypermobility in autistic and ADHD children. Despite previous reports of increased hypermobility in autistic and ADHD populations, we found that the prevalence was comparable between autism, ADHD, and neurotypical peers. However, the prevalence of joint hypermobility affected around on third of children, which remains important to clinically identify for autistic and ADHD children and adolescents due to its potential impact when delivering other therapies, participation in activity and sports, and its impact on the autistic and ADHD experience of pain and its management in later life. The Beighton Scoring System (BSS) is recommended for integration into developmental assessments to improve early detection, supporting better long-term health outcomes.

418.069 Impact of Co-Occurring ADHD and Anxiety on Bullying Among Young Autistic Children

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Background: Bullying is increasingly recognized as a significant stressor for autistic children. Bullying has been associated with increased anxiety and depressive symptoms among autistic youth, as well as school refusal, particularly for autistic children with ADHD. To date, most research has examined bullying among school-age or adolescent autistic youth, with limited studies on younger children and those with co-occurring ADHD and/or anxiety.

Objectives: The current study explored bullying among preschool and early school age autistic children. Study goals are to 1) characterize rates of bullying in young autistic children and 2) examine predictors of bullying including autism features, co-occurring psychiatric diagnoses, and emotional and behavioral symptoms. We hypothesized that autistic children with co-occurring ADHD and more autism features (namely social motivation and social awareness) would experience higher rates of bullying.

Methods: Participants were 92 autistic children aged 4-8 years old ($M_{age}=71.4$ months, $SD_{age}=14.2$ months; 32% female; 76% white; $M_{IQ}=96.3$, $SD_{IQ}=16.5$) from an ongoing study of autism and co-occurring ADHD and/or anxiety. The sample included four groups (autistic: $n=22$; autistic+ADHD: $n=21$; autistic+anxiety: $n=19$; autistic+anxiety+ADHD: $n=30$). ADHD and anxiety diagnoses and autism features were assessed via caregiver interviews with the Anxiety Disorders Interview Schedule – Parent version with Autism Spectrum Addendum (ADIS/ASA). Bullying was assessed using an ADIS/ASA item that characterizes frequency of bullying/significant peer rejection using a 0-3 scale ranging from none to severe. Caregivers also completed measures of emotional and behavioral symptoms (ADHD Rating Scale [ADHD-RS], Social Responsiveness Scale [SRS-2], Emotion Dysregulation Inventory [EDI]). We employed chi-square with Fisher's exact tests to examine rates of bullying (none/mild versus moderate/severe) and specific autism features, and logistic regression to compare bullying across diagnostic groups and in association with hyperactivity/impulsivity (per ADHD-RS), social communication (per SRS-2), and emotional reactivity (per EDI).

Results: Fifty-seven percent of caregivers reported that their child had experienced *any* bullying/peer rejection (i.e., even mild bullying), with 25% endorsing moderate/severe bullying. No significant relationship was found between moderate/severe bullying and children's social motivation or social awareness. Marginal associations were found between moderate/severe bullying and co-occurring psychiatric diagnoses ($\chi^2(3, N=92) = 6.6$, Fisher's exact $p=.09$). Caregivers of children with autism+ADHD and autism+ADHD+anxiety reported moderate/severe bullying more often (33% and 37%, respectively) than those with autism (14%) or autism+anxiety (11%). Co-occurring ADHD, but not anxiety, was associated with ~4 times greater likelihood of experiencing moderate/severe bullying (OR=3.92, 95% CI: 1.30–11.91, $p<0.05$). Hyperactivity/impulsivity symptoms approached statistical significance ($p=.06$) in predicting moderate/severe bullying, though no significant associations were found between social communication or emotional reactivity and bullying.

Conclusions: This study highlights that bullying and significant peer rejection can start as early as preschool for autistic children. In this young sample, autism social features were not associated with likelihood of experiencing bullying. However, autistic children with co-occurring ADHD were significantly more likely to have negative peer experiences than autistic children without ADHD. Understanding the factors that contribute to bullying may help caregivers, educators, and clinicians develop strategies to support autistic children in social settings, improving peer interactions and reducing the negative impacts of bullying.

418.070 Improving the Autistic Patient Experience on Inpatient Psychiatric Units Via a Consult/Liaison Service

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Background:

A recent meta-analysis documented that 54.8 % of autistic individuals meet the criteria for a psychiatric disorder (Hossain et al., 2020). The increased prevalence of psychiatric diagnoses contributes to increased rates of suicidality and aggression, which results in higher rates of inpatient hospitalizations (Devon et al., 2014; Segers & Rawana, 2014). Inpatient psychiatric treatment settings often do not address the specific needs of children and adults with autism (Way and Banks, 1990). Given the unique challenges in inpatient units, autistic patients have a significantly higher likelihood of receiving physical and pharmacologic restraints, have increased length of stay, and an increased likelihood of rehospitalization (Calabrese et al., 2023; Masserano et al., 2023; Maloret et al., 2018).

Objectives:

Given the risk of injury to patients and staff, the current study examines the effectiveness of an intellectual and developmental disability consult/liaison service on inpatient psychiatric units.

Methods:

The Positive Behavior Support (PBS) team is a novel multidisciplinary consultation care model. The team currently has clinicians from psychiatry, applied behavior analysis, speech pathology, and psychology. In order to test the effectiveness of the service, a survey was sent out unit staff who requested a consult within the past year. Twenty-five participants completed a survey to assess the effectiveness of the consultation/liaison service. Thirty-eight % were attending psychiatrists, 29 % were PCD/CNMs, 14 % were nurses, and 21 % were social workers. Questions included the reason for the consultation/liaison, helpfulness of the consult, the impact on patient care, and changes in case management. Given the sample size, descriptive statistics are utilized.

Results:

Results indicate that the most common consult was multifaceted, including behavioral management or psychotherapeutic intervention and diagnostic clarification. Specifically, in descending request order, behavioral management (86 %) was first, followed by psychotherapeutic intervention (71 %), diagnostic clarification (64%), confirmation of autism diagnosis (57 %), pharmacological interventions (36%), and disposition planning (29 %). 92 % of respondents endorsed that the service was helpful, with the majority endorsing behavioral management or numerous services being helpful. One key area endorsed was related to interdisciplinary collaboration and working with the team to improve patient care.

Conclusions:

Overall, this study demonstrates the effectiveness of a specialized consultative/liaison model of care that provides staff training and support to inpatient teams working with patients with intellectual and developmental. These goals have been achieved by interventions under multiple components, including direct clinical care, staff training and education, and system-level quality initiatives. Specifically, the PBS team has forged effective relationships with numerous teams that create a collaborative, interdisciplinary treatment team to help improve patient experience and decrease the risk of staff injury and/or burnout. Moreover, given the effectiveness of our work, future directions should include system-level training across medical and psychiatric units to achieve a larger goal to reduce the health care disparities faced by this vulnerable population by increasing staff education, bolstering system-level resources, and reducing safety events. Additionally, as the PBS team grows, extending services to medical units would help to improve patient experience across the NYP hospital system.

418.071 Increased Rates of Maladaptive Daydreaming (MD) in Individuals with Autism Spectrum Disorder (ASD) and Attention-Deficit/Hyperactivity Disorder (ADHD)

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Background: Maladaptive Daydreaming (MD) is a condition in which daydreaming is emotionally and sensorily immersive and enjoyable, leading to addiction and neglecting responsibilities, relationships, and self-care to spend more time daydreaming (Nauman 2023; Somer 2002). MD symptoms have a high degree of overlap with autism spectrum disorder (ASD) and attention-deficit/hyperactivity disorder (ADHD) (Nauman 2023; West et al. 2022; West et al. 2023). Individuals with MD often report that their MD began during childhood and occurred with stereotypic movements characteristic of autism (Hedderly et al. 2024; Somer 2023). Investigating MD's overlap with neurodevelopmental conditions can help us understand and identify these unique symptoms presentation in autistic populations.

Objectives: This study's purpose is to characterize MD's association with neurodevelopmental disorders to establish a clearer picture of MD's clinical profile. We hypothesized that participants with autism and ADHD would have higher mean MD symptoms and meet the proposed MD cutoff more frequently than participants without both diagnoses. We also hypothesized that MD symptoms would be associated with significantly higher autism and ADHD symptoms.

Methods: Participants are currently being recruited via Prolific, an online recruiting platform. Data ($N = 149$) has been collected from four groups: 44 participants with autism and ADHD, 32 ADHD-only participants, 32 autism-only participants, and 41 participants without either diagnosis. Surveys measured MD symptoms (the 16-item Maladaptive Daydreaming Scale, MDS-16), restricted and repetitive behaviors (the Adult Repetitive Behavior Questionnaire Self-Report Version, RBQ), ADHD symptoms (Adult ADHD Self-Report Scale Symptom Checklist, ASRS), and ASD symptoms (Autism Spectrum Quotient, AQ).

Results: A one-way ANOVA found a significant difference among the mean MD symptoms of the four groups ($F = 8.92, p < .001$). Post-hoc analysis indicated the autism and ADHD group had significantly higher MD symptoms than the non-autism or ADHD ($p < .001$), autism-only ($p = .041$), and ADHD-only ($p = .025$) groups. There were no other significant group differences ($p's \geq .164$). Chi-square analysis revealed a significant difference between the prevalence of MD in each of our four groups, $\chi^2(3) = 10.72, p = .013$. 40.9% of the autism and ADHD group were above MDS-16's diagnostic cutoff of 40 compared to 14.6% of the non-autism or ADHD group, 15.6% of the autism-only group and 18.8% of the ADHD-only group. In a hierarchical linear regression, after controlling for age and sex, inattention ($p = .008$) and hyperactivity ($p = .037$) symptoms were significantly associated with MD symptoms, but not after AQ subscales and RBQ scores were added in step 3 ($p's \geq .137$). After controlling for age, sex, and ADHD symptoms, the AQ's social skills subscale ($p < .001$) and the RBQ scores ($p < .001$) were significantly associated with MD symptoms while the AQ's attention to detail ($p = .043$) and communication ($p = .011$) subscales were significantly inversely associated with MD symptoms.

Conclusions: MD appears to be highly prevalent in those with a co-occurring diagnosis of autism and ADHD. Future investigation may offer insight into a unique symptom profile associated with cooccurrence of these diagnoses.

418.072 Psychological Distress in Autistic and Non-Autistic Israeli Children Exposed to War and Terrorism

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Background: Exposure to war and terrorism is linked to psychological distress, impacting both those directly involved and their relatives. Children, who are especially vulnerable due to their developing cognitive and emotional capacities, may be more gravely affected. However, there is a lack of research on the psychological effects of war and terrorism on autistic children.

Objectives: This study examined the psychological distress experienced by Israeli autistic children compared to non-autistic children following the October 7th, 2023, terrorism attack and subsequent war.

Methods: The study involved 228 parents of children aged 4-11 (134 autistic, 94 non-autistic) who completed online questionnaires regarding (1.) their child's exposure to war events and experiences (CEE; e.g., missile attack sirens, injury or death of family members, damage to home, having to evacuate home); (2.) their child's exposure to information about the war (CEI; e.g., TV broadcasts, posters in the public domain, adult conversations); and (3.) aggravation in their child's anxiety levels since the October 7th attacks (SCAS-A), based on the Spence Children's Anxiety Scale.

Results: Nearly all children (97.4%) were exposed to at least one potentially traumatic event related to the war. Non-autistic children had higher CEE rates than autistic children, but groups did not differ on CEI rates. Autistic children exhibited greater anxiety aggravation, particularly concerning physical injury, panic attacks, and agoraphobia. Group moderated the association between exposure level and anxiety aggravation for both CEE and CEI (Figure 1).

Conclusions: These findings highlight the unique vulnerability of autistic children during severe traumatic events and emphasize the urgent need for early detection, diagnosis, and specialized treatment of trauma in autistic children in conflict affected regions.



418.073 Teaching the Traumatized Autistic Student; A Qualitative Study of What Teachers Know and Would like to Know.

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Background: Autistic children and adults experience higher rates of adverse experiences than their neurotypical peers and may find a wider range of events traumatic (Rumball, Happé & Grey, 2020). The symptoms of trauma or PTSD may also present somewhat differently in autistic young people. Autistic children have largely been excluded from research on PTSD to date, despite potential challenges to self-advocate, report trauma and access care for trauma-related symptoms. Teachers with experience working with autistic children are well-placed to identify trauma-related symptoms, identify key areas for support, and address traumatised children's wellbeing in their classrooms.

Objectives: This study investigates teachers' experiences in recognising, adapting to, and supporting autistic children with trauma-related behaviours. Our goal was to identify any gaps in support for both children and their teachers, learn about successful approaches, and gain a deeper understanding of how autistic children are presenting with trauma in their day-to-day lives.

Methods: A qualitative approach was employed; fifteen teachers were recruited via convenience sampling from mainstream and special educational needs (SEN) schools in the UK, and data was collected via semi-structured interviews completed over teams. A Public and Patient Involvement (PPI) group of teachers were consulted and assisted in the design of the interview questions. Reflexive thematic analysis (Braun & Clark, 2006) identified themes across the interviews.

Results: Four themes were identified: 1) The relationship between trauma and autism, 2) Trauma-informed practice, 3) The need for a holistic approach, and 4) Insufficient support and resources. These themes are further divided into subthemes, each highlighting specific challenges and needs. Findings suggest that trauma-exposed autistic children experience similar, if not greater, difficulties in the classroom compared to a traumatised neurotypical child. Additionally, autistic children may find more seemingly every-day school experiences traumatic. Taking a whole-school approach to both trauma and neurodiversity was highlighted alongside a need for greater inter-agency collaboration. Teachers felt that appropriate context-specific training, time to build relationships and adequate school resources would be most beneficial to their ability to support the needs of individual children.

Conclusions: This is the first UK-based study exploring teachers' experiences with teaching traumatised autistic children. Our findings provide valuable insights to directly inform school policy and practices, and emphasise the need for allocation of resources to SEN and mental health support in schools, as well as the development of targeted trauma-related teacher training adapted to specific school context. Dissemination of successful approaches across mainstream and SEN schooling will be critical for establishing best practices.

418.074 Longitudinal Outcome of Patients with Profound Autism and Catatonia

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Background:

Catatonia is a highly morbid psychomotor and affective disorder which can affect autistic individuals with and without profound impairment. Catatonic symptoms are treatable with pharmacotherapy and electroconvulsive therapy, but the longitudinal effectiveness of these treatments has not been described. In addition, a greater focus on the outpatient management of catatonia has been highlighted in expert opinion publications. However, no data is available which supports this assumption such as a reduction in medical admissions.

Objectives:

Determine the clinical efficacy of outpatient pharmacotherapy and electroconvulsive therapy, and the possible benefit of outpatient management on preventing medical admissions for autistic individuals with catatonia.

Methods:

We conducted a prospective observational cohort study of patients with autism and co-morbid catatonia who received outpatient care in a specialized outpatient clinic from July 1st, 2021 to May 31st, 2024. Data investigating pharmacologic interventions, and clinical measures including the Bush Francis Catatonia Rating Scale (BFCRS), Kanner Catatonia Severity Scale (KCS), Kanner Catatonia Examination (KCE), and Clinical Global Impression – Improvement (CGI-I) were collected. The frequency of medical admissions pre- and post-clinic intake was collected.

Results:

Forty-five patients were identified with 39 (86.7%) meeting criteria for profound autism. All patients received pharmacotherapy. 44 (97.8%) were treated with benzodiazepines with a mean maximal daily dose of 17.4 mg (SD=15.8) lorazepam equivalents. Thirty-five patients (77.8%) required more than one medication class for treatment. Fourteen patients (31.1%) attempted to taper off benzodiazepines during the study period; of these, 5 patients (11.1%) were successfully tapered off, and the remaining 9 (17.8%) discontinued the taper due to a return of catatonic symptoms. Statistically significant improvement was observed across all clinical domains except the KCS. However, the majority remained symptomatic over the study period.

In this cohort, 29 (64.4%) of patients had a medical admission before clinical intake. After clinic intake, 9 patients (20.0%) were admitted medically. After controlling for age, sex and race, there is evidence of an association between the time of clinic intake and the risk of having medical admission ($p < 0.001$). The estimated odds ratio is 0.12 with 95% CI (0.04, 0.31), which means that, for the patients at the same age and of the same sex and gender, they have 88% lower odds of having admission after the initial clinic intake than before.

Conclusions:

In this cohort of outpatients with catatonia and autism, the prevalence of profound autism was notably elevated. Despite clinical improvements while receiving the gold standard for psychopharmacologic management of catatonia, chronic symptoms remained for the majority of catatonia patients over the study period, and few were able to taper and discontinue benzodiazepine treatment. Lastly, longitudinal follow up in a specialized clinic for autistic individuals with catatonia significantly reduced the odds of medical admission, highlighting the importance of specialized outpatient care in this population.

418.075 Hair Cortisol in Young Children with Autism and Their Parents: Associations with Child Mental Health, Eating Behavior and Weight Status.

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Background:

Children with Autism Spectrum Disorder (ASD) and their parents face daily challenges that may be stressful for both. However, little is known about biological stress (hair cortisol concentrations [HCC]) in these families and its connection to children's health outcomes.

Objectives:

This study investigates: 1) differences in biological stress between children with ASD and same-aged children from the general population, 2) associations between biological stress of children with ASD and their mental health, eating behavior, and Standardized Body Mass Index (BMIz) 3) associations between (self-reported and biological) stress of parents of children with ASD and the mental health, eating behavior, and BMIz of their children.

Methods:

Stress was measured in 102 young children with ASD and their parents (101 mothers, 86 fathers) using HCC and self-reported parenting stress (Parenting Stress Questionnaire [OBVL]). Child mental health was measured through autism symptoms (Autism Diagnostic Observation Scale [ADOS-2] and Social Responsiveness Scale [SRS-2]) and problem behavior (Child Behavior Checklist [CBCL]). Child eating behavior (Child Eating Behavior Questionnaire [CEBQ]) and BMIz were also measured. HCC scores of young children with ASD were compared to the reference intervals that were provided by the study of Kruijf and colleagues (2020) for children aged 3 to 7 years ($n = 82$).

Results:

Of the children with ASD, 15.3% scored above the 97.5th percentile for HCC, which was significantly higher than the reference group. Child HCC was not linked to mental health, eating behavior, or BMIz. Maternal stress (self-reported and HCC) was associated with externalizing problem behavior ($r = -.29, p < .01$), internalizing problem behavior ($r = -.22, p = .04$) and total problem behavior ($r = -.25, p = .02$) of their children with ASD, but not with ASD symptoms (ADOS-2 or SRS). In fathers, self-reported parenting stress correlated with reported autism symptoms in all domains of the SRS ($r = .24-.40, p < .05$), externalizing problem behavior ($r = .47, p < .01$), internalizing problem behavior ($r = .40, p < .01$) and total problem behavior ($r = .49, p < .01$) of their children. We did not find associations between HCC of fathers and child mental health. Both parents' self-reported stress was associated with child eating behavior, specifically child emotional overeating ($r_{\text{mothers}} = .22, p = .03, r_{\text{fathers}} = .27, p = .02$;) and child emotional undereating ($r_{\text{mothers}} = .42, p < .01, r_{\text{fathers}} = .35, p < .01$).

Conclusions:

At a young age, children with ASD display higher HCC than their peers, suggesting potential alterations in stress-regulation of young children with ASD. Given these findings, monitoring HCC in research and clinical practice could improve our understanding of stress-regulation in children with ASD. Additionally, parental stress was related to children's mental health and eating behavior, underscoring the importance of family dynamics in the investigating and supporting the well-being of children with ASD.

418.076 Chronic Parenting Stress in Parents of Children with Autism: Associations with Chronic Stress in Their Child and Parental Mental- and Physical Health

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Background:

Parents of children with ASD often demonstrate high levels of stress and associated health problems. Chronic stress may impact the health of parents of young children with ASD. In addition, chronic stress may impact parenting strategies and cortisol levels in their children. Although stress in parents of children with ASD has been intensely investigated, most research has focused on the impact of subjective reports of stress and fewer studies have focused on biological stress, as measured by hair cortisol concentrations (HCC) in parents of children with ASD. In addition, the association between HCC in parents and their children with ASD has not been investigated yet. Furthermore, there is a gap in regarding the associations between chronic stress and mental and physical health of parents of young children with ASD, in which fathers have been understudied.

Objectives:

To investigate 1) associations between chronic stress of children with ASD and chronic stress in their parents, 2) associations between chronic stress and mental health in mothers and fathers and 3) associations between chronic stress and physical health in parents of children with ASD.

Methods:

In 181 parents (98 mothers, 83 fathers) of 99 young children with ASD chronic stress was measured using the Parenting Stress Questionnaire (OBVL) and hair cortisol concentration (HCC) analysis. Parental mental health was measured using the Brief Symptom Inventory (BSI). Parental Eating Behavior was measured using the Dutch Eating Behavior Questionnaire (DEBQ). Physical health was evaluated by Body Mass Index, waist circumference, blood pressure, cholesterol, triglycerides, and glucose.

Results:

As displayed in Figure 1, Child HCC was related to HCC of fathers ($r = .40, p < .01$) and to HCC of mothers ($r_{mothers} = .51, p < .01$). In mothers, HCC was associated with lower reported parenting stress ($r = -.33, p < .01$). In mothers and fathers, we found a strong relation between reported parenting stress and mental health problems ($r = .55-.61, p < .01$) and mental health problems were twice as frequent as in the norm-population (41.1-45.8% versus 20%). In mothers and fathers, reported parenting stress was associated with emotional eating behavior. HCC was associated with higher glucose levels in mothers. There were no associations between chronic stress and the other physical health measures in mothers and fathers.

Conclusions:

Parents of young children with ASD are at high risk for chronic stress, with impact for their mental and physical health. Additionally, chronic stress of parents, cannot be perceived isolated from the stress in their children with ASD. Therefore, an integrative and intergenerational approach to alleviate stress in parents and children with ASD could benefit families of children with ASD. In addition, we encourage researchers in this field to further explore this topic longitudinally to gain better understanding in the long-term effects of chronic stress on mental and physical health in parents of children with ASD.

**Poster Session****419 - Communication and Language I**

May 2nd, 2025, 12:30 PM - 1:30 PM - Hall 4A

419.076 The Relationship between Linguistic Skills and Mathematical Skills in Autistic Adolescents and Neurotypical Adolescents
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Background:

With the rising prevalence of Autism Spectrum Disorder (ASD) (Davidovitch et al., 2020) [1], research has increasingly focused on this population. However, studies exploring language and academic skills in autistic adolescents remain limited (Whyte & Nelson, 2015) [2]. This study aims to advance understanding by exploring the relationship between mathematical and linguistic skills, offering valuable insights into an under-researched area. Difficulties in abstract thinking, commonly seen in autism, may influence both language and mathematical abilities (Chahboun et al., 2016; Bae et al., 2015) [3,4]. Language functions as a key cognitive tool for expressing abstract concepts, which supports the development of both linguistic and mathematical understanding (Vygotsky, 1994) [5]. Since mathematics involves the mental representation of abstract ideas and relies on higher-order thinking skills (Wilkinson & Jaime, 2016; Giaquinto, 2020) [6,7], challenges in abstract reasoning may hinder the ability to solve word problems and grasp algebraic concepts, illustrating the interconnectedness of language and mathematics.

Objectives:

Our aim was to examine both mathematical and language abilities in autistic adolescents and their neurotypical peers, as well as the relationships between these skills across the two groups. Specifically, we investigated whether the patterns of strengths and challenges in mathematics and language were distinct in the autism group, with the goal of identifying any differences that are unique to autism. This approach allowed us to explore whether the interplay between linguistic and mathematical abilities in autistic individuals follows a different pattern compared to their neurotypical peers.

Methods:

Participants included 67 adolescents (31 ASD: 24 males, 7 females; 36 TD: 27 males, 9 females; aged 12-19.2 years). The assessment process consisted of cognitive background measures, language domain tests, and mathematical assessments in verbal and written formats. Data analysis adhered to original assessment guidelines. Responses were coded by two expert raters, with inter-rater reliability ensured. T tests compared groups, and Pearson correlations examined relationships between mathematical and language domains.

Results:

Group comparisons revealed similar performance in phonology, semantics, and syntax. Autistic adolescents exhibited lower scores in morphology, pragmatics, and all mathematical domains. Analysis revealed distinct linguistic-mathematical skill relationships between groups. Neurotypical adolescents showed widespread positive correlations, with phonology, morphology, and syntax linked to all mathematical skills assessed. Autistic adolescents exhibited fewer, more specific connections, with morphology and pragmatics demonstrating notable relationships to mathematical abilities. These findings highlight divergent cognitive profiles, suggesting different language-math integration patterns in autistic and neurotypical adolescents.

Conclusions:

Difficulties in morphology and pragmatics among autistic participants align with previous research [2]. Lower mathematical performance in autism potentially relates to challenges in mental representation of abstract concepts [4]. The distinct patterns in linguistic-mathematical relationships between groups are noteworthy. Strong correlations in neurotypicals suggest interconnectedness of language and mathematical thinking [6], while fewer connections in autistic adolescents may reflect abstract thinking challenges [3]. These results emphasize the need for tailored educational approaches and comprehensive cognitive assessments in autism. Future research should explore interventions leveraging linguistic strengths to support mathematical learning in autistic adolescents, potentially leading to more effective individualized support strategies.



419.077 Perceptions of Autistic and Non-Autistic Emotional and Neutral Expressions By Autistic and Non-Autistic Raters

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Background: Autistic individuals are perceived more negatively by non-autistic individuals after brief exposures (e.g. Grossman 2015) and across different contexts (e.g. Sasson et al. 2017), although most studies analyze only impressions formed by non-autistic individuals. Recent data indicate that the emotional content of facial expressions is related to negative perceptions (Foster et al. 2024), calling into question the common autistic strategy of mimicking non-autistic emotional expressions to improve social inclusion (Miller et al. 2021). Mimicry of non-autistic expressions is even encouraged in some social intervention programs (Lindsay et al. 2013), but there is no evidence that emotional mimicry improves impressions formed by autistic or non-autistic perceivers.

Objectives: Analyze differences in the perceptions of autistic and non-autistic raters about autistic and non-autistic adolescents' facial and vocal expressions when mimicking emotional versus neutral sentence.

Methods: Autistic and non-autistic adult raters (Autistic N=120, Non-autistic N=141) watched 48 video clips of autistic and non-autistic adolescents mimicking sentences performed by a non-autistic adolescent. Half the sentences were emotional (e.g. sadness: "I'm never going to see him anymore") and half were neutral (e.g. "I walked into the kitchen"). Raters provided thin slice judgments for each video using slider bars to indicate agreement with seven statements (e.g. "This person is trustworthy" or "this person spends a lot of time alone" Sasson et al. 2017).

Results: There was no significant difference in ratings provided by autistic and non-autistic adults ($F(1, 259) = .58, p = .45$), indicating that both groups formed similar impressions of these expressions. There was a marginal effect of stimulus diagnosis, with raters reporting more favorable impressions of autistic than non-autistic adolescents ($F(1, 259) = 3.8, p = .052$). Participants also provided significantly more favorable ratings for emotional than neutral expressions ($F(1, 259) = 18.68, p < .001$). Importantly, there was a significant stimulus neurotype (autistic, non-autistic) by expression-valence (emotional, neutral) interaction ($F(1, 259) = 79.83, p < .001$). Post-hoc comparisons revealed that emotional expressions produced by autistic adolescents received significantly less favorable ratings than non-autistic emotional expressions, while neutral expressions produced by autistic adolescents were rated significantly more favorably than non-autistic neutral expressions.

Conclusions: The finding that emotionally *neutral* sentence mimicked by autistic adolescents were perceived more favorably than those of their non-autistic peers may align with research showing that autistic facial expressions are more likely to be perceived as expressing a positive emotion, even without a positive stimulus to prompt it (Costa et al. 2017, Grossman et al. 2018, Foster et al. 2024). Raters may have preferred the positive-appearing expressions of autistic adolescents to the neutral expressions of non-autistic adolescents. Conversely, when autistic adolescents mimicked *emotional* expressions, they were perceived more negatively than their non-autistic peers, even by other autistic people. These data show that autistic facial and vocal expressions are not uniformly perceived more negatively than those of their non-autistic peers and that interventions or masking strategies focused on mimicry of neurotypical emotional expressions may not be in autistic individuals' best interest.



419.078 Eye Movement Indices of Audiovisual Speech in Children with Autism Spectrum Disorders

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Background: The use of visual and auditory cues during speech comprehension and its relation to other processes is subject to developmental changes. Attention to the talker mouth seems to predict lexical access and word reading acquisition in children 2 to 8 years old with typical development (TD) (Worster et al., 2018; Zamurer et al., 2023) while attention to the eyes in 12-month-old infants would predict the development of social skills (Pons et al., 2019). The literature about sensory dominance is inconclusive for children with autism spectrum disorder (ASD) in the transition between preschool and primary school (5 to 8 years), measured by eye movement indices of visual attention to the talker's eyes and mouth (Guillon et al., 2014; Jertberg et al., 2024).

Objectives: To examine the gaze patterns of 5 to 8 years old children with and without ASD towards the talker's face during storytelling by means of eye movement indices of verbal and social attention.

Methods: 20 children with ASD and typical IQ (aged 5 to 8) and 26 chronologically age-matched typically developing peers were asked to watch videos in which an adult told six stories in two presentation modalities: audiovisual or audio only (with a fixed face image) while their eye movements were monitored. After each video, the children were asked to answer 3 multiple-choice comprehension questions by pointing to the image that corresponded to the correct answer. To calculate the verbal and social attention indices, we obtained the proportion of time gazing (dwell time) the talker's eyes and mouth areas during the speech episode and during the pause pre- and post-speech.

Results: Accuracy and eye movement data were analysed using Generalized Mixed Models in R. Comprehension accuracy was similar across presentation modalities for both groups but children with TD outperformed children with ASD across conditions ($p < .03$) (Figure 1_Top). Regarding gaze patterns in the AV condition (Figure 1_Down, both groups showed a mouth versus eyes preference (TD, $p < .001$; ASD, $p < .002$) during speech but children with TD spent longer proportion of time gazing the mouth than the children with ASD both during the speech ($p < .018$) and during the pause pre-speech episode ($p < .001$). During the post-speech episode, both groups gazed longer the eyes than the mouth ($p < .015$).

Conclusions: Comprehension accuracy of talked stories was higher in 5 to 8 years old children the TD than in children with ASD, regardless the presentation modality. The gaze patterns to the talker's face seemed to be dissimilar between groups, indicating that eye movement indices of verbal (eyes-mouth synchronization) and social attention (pause-speech synchronization) could be used as biomarkers of atypical developmental trajectories in children. These data are consistent with previous findings with other speech stimulus in typical development (words and sentences). Filling the research gap for the transition between preschool to school ages would help to obtain indices of school readiness for this population as well as intervention guidelines.



419.079 A Few of My Favorite Things: Talking about a Strong Interest Affects Speech Prosody and Conversation Engagement in School-Aged Autistic and Non-Autistic Children

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Background:

Speech prosody is a critical component of pragmatic language, allowing an individual to convey implicit meaning and emotional intent through the rhythm, stress, and intonation of their speech. Despite its prominent role in social interactions, prosody has overwhelmingly been measured using structured, decontextualized tasks that may miss certain nuances of social speech (Asghari et al., 2021). One key aspect of everyday conversations that could influence speech prosody is semantic *content*. Autistic people have described feeling joy and social connectivity when talking about their strong interests (Long, 2024). One previous study (Nadig et al., 2010) anecdotally described increased script-like speech, eye contact, and overall engagement when autistic individuals discussed a topic of strong interest. However, the effects of conversation topic on speech prosody have not yet been studied.

Objectives:

Our goal was to test whether conversation topic (general discussion vs. topic of strong interest) affected acoustic measures of speech prosody (speech rate, mean pitch, pitch range, and intonation).

Methods:

We recorded 10-minute “getting to know you” conversations between school-aged children ($N=39$; $n=20$ autistic; 49% female, $M_{age}=6.76$ years, $SD_{age}=1.7$ years, matched on chronological age and IQ) and an adult experimenter. Halfway through the conversation, the experimenter brought up the child’s strong interest, which was identified beforehand by a caregiver. Experimenters provided Likert ratings of the child’s perceived enjoyment and engagement with the task. Recordings were transcribed and segmented into interpausal units, which were individually coded as being related to either a “general discussion” or “strong interest” topic. Acoustic components of prosody were derived for each speech unit: Speech rate (syllables per second), mean pitch (semitones), pitch range (semitones), and intonation (pitch turns per second, Wehrle et al., 2018). A two-level linear mixed model was run for each prosodic element, with topic (general discussion or strong interest) as a predictor and child-level variables (see Table 1) as covariates.

Results:

In models controlling for child-level characteristics, there was a significant effect of conversation type on speech rate and intonation, such that children spoke faster and more dynamically when speaking about a topic of strong interest (Table 1, Figure 1). Increased speech rates ($\beta=0.78$, $p=.02$) and more animated intonation ($\beta=0.31$, $p=.04$) were also significant predictors of increased experimenter-rated engagement with the task, and intonation ($\beta=1.64$, $p=.03$) was a significant predictor of greater child enjoyment as rated by the experimenter. A greater proportion of interest-related speech segments had trending effects on both engagement ($\beta=2.24$, $p=.05$) and enjoyment ($\beta=6.45$, $p=.05$).

Conclusions:

These results underscore the importance of considering conversational content when examining and describing prosody in children, as it can impact some of the most commonly measured and perceptually salient elements of prosodic speech. Regardless of neurotype, school-aged children produced faster and more animated speech when speaking about topics of strong personal interest. These elements of prosodic speech also predicted experimenter-rated ease of conversational engagement, and experimenter perceptions of child conversational enjoyment. Future research is necessary to fully understand the effects of conversational topic on prosodic variability in children throughout development and into adulthood.



419.080 A Study on Semantic Processing in Children with Autism Spectrum Disorders Based on ERP and Phase Amplitude Analysis
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Background:

The semantic processing mechanisms of the children with autism is generally abnormal and heterogeneous. This may be one of the potentially reasons for their communication deficits. The semantic processing mechanism of ASD remains unclear till now. The current study employed the picture semantic priming paradigm to investigate the temporal dynamics of semantic processing in ASD by comparing N400 components between ASD and control groups. Additionally, we employ neural oscillation analysis through “Gamma/Theta phase-amplitude coupling” (PAC) to explore the specificity of picture semantic memory retrieval in ASD during picture priming tasks.

Objectives:

Integrating cognitive tasks with neural oscillation analysis, this study examines the time-frequency dynamics of semantic processing mechanisms in ASD by analyzing N400 components and PAC features. The goal is to elucidate the underlying mechanisms contributing to communication impairments in individuals with ASD.

Methods:

Participants with ASD (age range 5-10 years, $M = 6.57$; $SD = 1.718$) were recruited through the China Rehabilitation Research Center. The age matched controls (age range 5-10 years, $M = 7.14$; $SD = 1.952$) were recruited through advertisements in the local media.

During the picture priming semantic paradigm, high functioning ASD children and the controls participated in the experiment, in which a visual picture presents an auditory target word that is consistent or inconsistent with the picture. The obtained EEG data is used to analyze N400 indicators related to semantic processing and Theta-Gamma PAC indicators related to picture memory retrieval.

Results:

The results showed that the N400 response was significant in both the ASD

and TD groups. The average amplitude of the N400 response in the ASD group was significantly greater than that in the TD group ($F = 4.888$, $p = 0.047$, $p < 0.05$). Based on the results of the ERPs, it can be concluded that children with ASD may have stronger neural responses to semantic or contextual inconsistencies, which may indicate that they are more sensitive to mismatches in semantic expectations. The PAC analysis shows that in the picture semantic priming paradigm, picture recognition tasks involve memory retrieval and extraction, and the coupling strength between the left frontal lobe Theta phase and the posterior parietal occipital lobe Gamma amplitude in ASD children is reduced compared to TD children. Based on the results, it can be concluded that the decrease in Theta-Gamma PAC intensity in children with ASD may correspond to a decrease in communication and synchronization between brain regions involved in memory retrieval and visual processing.

Conclusions:

The conclusion of this study indicates that there is a certain degree of delay in semantic information processing speed. During the entire time process of the picture-priming semantic paradigm, there are certain difficulties in memory retrieval at specific stages when visual pictures appear. Generally speaking, a decrease in the functional role of image memory retrieval in children with ASD may affect the integration of semantic information in subsequent stages. However, whether there is a causal relationship between the two is difficult to conclude in this study and further exploration is needed in the future.

419.081 A Systematic Review of Language Interventions for Minimally Verbal Individuals

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Background: Language allows individuals to communicate their wants and needs, and those who are affected by language difficulty puts them at a higher risk of adverse outcomes related to various aspects of their lives, that may pose barriers in the academic, social, and behavioral domains. Research supports a correlation between language difficulty and problem behavior (Chow & Wehby, 2016). Children who are minimally verbal or nonverbal often have a diagnosis that fits under the Individualized Education Plan (IEP) categories, such as autism spectrum disorder (ASD) or individuals with neurological differences (Tager-Flusberg & Kasari, 2013; Vrečar et al., 2017). However, most evidence-based practices for minimally verbal individuals are for individuals with ASD (Chenau et al., 2021; Koegel et al., 2019). Hence, families and practitioners may struggle to select resources relevant to their context and client characteristics. Thus, identifying the current best practices aimed at summarizing the evidence base for interventions for minimally verbal individuals would assist in identifying the current knowledge base and gaps to guide future research.

Objectives: This systematic review aims to summarize the research on language interventions for individuals who are minimally verbal with a focus on improving verbal expressive communication by a) describing prelinguistic skills targeted in interventions, b) mediators of interventions, c) intervention setting, d) characteristics of participants (e.g., autism vs. other diagnosis and age).

Methods: Guidelines proposed by the Preferred Reporting Items of Systematic Reviews and Meta-Analyses (PRISMA) were followed, and a total of 131 intervention studies were reviewed. Both group and single-subject research designs were included.

Results: Across studies, interventions mainly targeted prelinguistic skills such as joint attention, play, and imitation. Most studies utilized researchers or clinicians as interventionists in experimental settings. However, there is an increasing presence of other personnel as interventionists, such as caregivers and peers, allowing the setting to be expanded to applied settings (e.g., classrooms and homes). There was also an imbalance in the age and diagnosis of participants. The majority of studies included individuals in the younger age groups, such as preschool or elementary children, with few studies including adults or adolescents. Participants were mostly diagnosed with autism compared to other disorders such as down syndrome.

Conclusions: Guidelines are suggested for future research to broaden the participant pool and intervention setting. Potential mechanisms of change proposed by this review should be used to advance and inform the development and selection of language interventions.

419.082 Additional Language Learning in Autistic Adults

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Background:

As many as two-thirds of persons on the autism spectrum have normal intellectual ability. Such persons attend college, have careers, and study foreign languages or acquire an additional language. A subset of autistic adults has reported having languages as a special interest (Caldwell-Harris, 2021; Digard et al., 2020). In one qualitative study, this group reported learning via grammar books and self-study and being interested in language history and structure, reminiscent of what has been reported for polyglots Hyltenstam (2021).

Objectives:

Investigate the individual aptitude factors that influence additional language learning; what methods are used for learning; compare outcomes between autistic and neurotypical adults; explore the subjective experience of learning.

Methods:

Survey results obtained were from 114 self-identified autistic adults, recruited from Autism forum sites. Neurotypical participants (N=112) were recruited from general social media and an undergraduate subject pool. Participants reported a wide variety of native languages and ranged in age from 18 to 59.

Language Background

- Additional language learning history (on up to 5 languages)
- Self-ratings of speaking, reading, writing and listening
- Method of acquisition, contexts of use and amount of use
- Can Do Scale (e.g., order at a restaurant, read a newspaper)

Autism-related survey item.

- Autism Quotient (AQ; to quantify autistic traits)
- Systemizing Quotient (SQ; because systemizing ability could facilitate learning language structure)
- Autistic traits influence the language learning experience

Language aptitude (see examples in Table 1)

- Phonological Pattern Recognition ('Sound it out' task)
- Sound Symbolism (sensitivity to meaning-sound correspondences)
- Part of Speech Determination (sensitivity to grammatical structure)
- Memory test of previously seen nonsense words

Results:

Autistic participants reported learning on average 2.7 additional languages compared to 1.4 reported by neurotypical learners, a statistically reliable difference. Autism Quotient scores correlated positively with Parts of Speech and Sound it Out tests (Table 2). Autistic learners reported a tendency to use a self-taught method, whereas neurotypicals were more likely to learn an additional language through formal education. In addition, autistic learners favored media and structured learning while neurotypical learners reported more learning via social interaction and immersion. Autistic respondents rated themselves as less proficient in the languages they had studied, suggesting that they wanted to learn languages, but didn't follow-through as often as did the neurotypical respondents.

Autistic respondents more often answered affirmatively to the open-ended question, Has learning a second or foreign language improved communication in your first language? For example:

"Yes, I feel more confident speaking in English after learning Japanese, where previously my anxiety or social difficulties would prevent me from doing so."

"It greatly helped me to better communicate with my co-workers and avoid misunderstandings."

Conclusions:

Additional language learning could be an intervention to improve social functioning, for at least some persons with autism. Stakeholders and autistic individuals themselves could benefit from learning about the discrepancy between wanting to learn an additional language and being able to achieve proficiency.



419.083 Addressing the Paradox of Studying Autistic Females: Pragmatic Atypicalities in Sisters of Autistic Individuals

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Background:

Females have historically been under-represented in autism research, and many studies are based on (almost) exclusively male participants (D'mello et al., 2022). This male-centered focus has shaped our understanding of autism, leading to biased representations, including in diagnostic practice (Cruz et al., 2024). Consequently, autism's manifestation in females is often misinterpreted or overlooked (Hull et al., 2020). For example, while socio-pragmatic atypicalities are considered a core feature of autism (Paul, 2007), recent studies have suggested that autistic females may exhibit fewer difficulties in pragmatic tasks compared to autistic males (den Hartog et al., 2023).

A key paradox in research on autism in females is the lack of data on females who are rarely diagnosed because, precisely, of a different presentation. A potential solution to better understand the subtler presentations of autism in undiagnosed females is to include participants at high likelihood for autism. As autism is highly heritable, a sibling of an autistic individual has 15 to 20 % likelihood of also being autistic (Hansen et al., 2019). We apply this approach, traditionally used in prospective studies with infants, to an adolescent population, a critical period for identifying or unmasking difficulties encountered by autistic females (Rutherford et al., 2016).

Objectives:

This study aims to investigate the linguistic profile of sisters of autistic individuals. We hypothesized that the sisters may experience communicative difficulties not captured by traditional language assessment.

Methods:

A total of 76 female participants (24 sisters; 22 autistics; 30 non-autistics) aged between 9 and 16 years ($M = 12.16$; $SD = 2.33$) took part in this study. Core language abilities were assessed using the CELF-5 (Wiig et al., 2019). Pragmatic abilities were evaluated through parental reports (CCC-2; Norbury et al., 2004) as well as a narrative task. For the narrative task, both the coherence and the fluency were analyzed. Group comparisons were conducted to examine differences between sisters, autistic and non-autistic participants. To represent individual profiles of the sisters, we calculated mean and standard deviation for each narrative measure of interest using the data from non-autistic participants. These values were then used to z -transform the individual scores of participants in the sister group.

Results:

There was no significant difference between sisters and non-autistic participants in CELF scores, however the HL group displayed significantly lower scores on the CCC-2. Six sisters met the threshold for a "communication impairment" (sic). Among them, three had a profile suggestive of autism (as per CCC-2 standardized criteria). For the narrative, the sister group did not differ from non-autistic group on any measures. However, when looking at individual profiles Half of the sisters presented a narrative profile with at least one measure above 2σ , which is to be considered as "atypical".

Conclusions:

Our results indicate that despite typical language abilities, sisters of autistic individuals exhibit subtle yet significant pragmatic difficulties. A closer look reveals that the focus should be more on individuals than groups. This study highlights the need for longitudinal studies to understand the potential evolution of these challenges into clinically significant features.



419.084 Alternative Pathway for Language Acquisition in Autism : Evidence for Enhanced Statistical Learning in Unexpected Bilingual Autistic Children

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Background: In typically developing children, language acquisition is bolstered by socio-cognitive skills, such as joint attention and gaze-following behavior (Tomasello, 2010). Early onset and life-long atypicality in these socio-cognitive skills is a core characteristic of autism. Language disabilities and delays are often linked to socio-pragmatic disabilities. Evidence from retrospective studies show that difficulties in processing joint attention is linked with a higher chance of remaining minimally verbal (Anderson et al., 2007). However, there is also evidence that some autistic children acquire language despite persisting low socio-communicative abilities (Ellis Weismer & Kover, 2015; Kissine, 2021). Another kind of evidence that language acquisition can occur with little reliance on socio-communicative interaction is the phenomenon of Unexpected Bilingualism (UB) in autism (Abd El-Raziq et al., 2023; Dumont et al., 2024; Francis et al., 2024; Kadiri & Anasse, 2023; Kissine et al., 2019; Vulchanova et al., 2012; Zhukova et al., 2021). These autistic children, by only mere exposure to screens, develop advanced phonological, lexical and syntactical skills in a language that no one uses around them. However, the mechanisms enabling such atypical language acquisition remains unknown as current descriptions of UB are limited to case studies. One hypothesis could be that autistic-UB children rely more on mechanisms that do not require social interaction, such as statistical learning, i.e., the extraction of statistical regularities from the environment (Naigles, 2013, 2016). A particular type of statistical learning are non-adjacent dependencies AXB structures, where the B-element can only be predicted based on the A-element. Such dependencies are thought to be fundamental for syntax acquisition (Erickson & Thiessen, 2015).

Objectives: In this study, we used an artificial language paradigm to explore whether autistic children, with or without UB profile, have intact or even enhanced statistical learning abilities, which would enable them to acquire language from exposure to screens.

Methods: 47 9-16 years old autistic children, among which 11 with an UB profile (parental report confirmed by the CELF-V) and 47 age-matched non-autistic children took part in the study. In this task, children are exposed to an artificial grammar composed of 3-word sentences and asked to detect target elements occurring on the third location. In the training blocks, and unknown to the participants, some trials have the underlying AXB structures, such that the target in the third (B) position can be predicted based on the element in the first (A) position. In a disruption block, this underlying rule is cancelled, such that targets are replaced by fillers elements in position B.

Results: Linear mixed effect regressions on reaction times revealed that all groups exhibited an effect of disruption, meaning that all participants learned the non-adjacent dependency and were disrupted by its absence. However, the analysis on the training blocks revealed a notable group difference: the autistic-UB learned significantly faster the non-adjacent dependencies, showing a significant decrease in reaction time whereas autistic and non-autistic were flat (Figure 1).

Conclusions: These results seem to indicate a distinct cognitive profile that may underly the phenomenon of UB.



419.085 Assessing Social Communication in Autistic Children Using the Q-Social: Inter-Rater Reliability across Parents and Professionals

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Background: The Q-SoCiAL (Questionnaire for Social Communication in Young Autistic Learners) is a newly developed measure designed to assess social communication skills in autistic children. Deficits in social communication are a core feature of autism. Therefore, it is important to assess these skills across various contexts and by different raters. Integrating input from parents, teachers, and clinicians provides a comprehensive view of children's abilities, as each rater observes the child in distinct environments. Measures of social communication are integral in determining areas of strength, challenges and identifying intervention goals for children. Evaluating the psychometric properties of measures under development is a fundamental step in measure development. Inter-rater reliability is particularly important as high levels indicate the measure assesses the same construct and is interpreted similarly across raters.

Objectives: The current study examines the inter-rater agreement of parent-parent and parent-professional dyads' reports of children's social communication skills. Another objective of the study is to identify factors that influence the convergence or divergence of parent and professional ratings of social communication skills.

Methods: The social communication skills of 113 children aged 3 to 7 years ($M = 5.10$, $SD = 1.03$) were evaluated by parents and professionals who work with the child (48% teachers, 35% childcare providers, and 17% ABA therapists). This resulted in 65 parent-to-parent and 48 parent-to-professional dyads. The sample consisted of 84 boys and 29 girls and was moderately diverse with 74% of the children identified as white. To determine inter-rater reliability and potential variables that influence ratings, bivariate correlations and linear regression analyses were conducted. Correlations for total scores across all subscales and correlations between each subscale were calculated. Additionally, correlations on a subscale focused on challenges in social communication were calculated.

Results: All total and subscale scores of parent-parent and parent-professional dyads were significantly correlated. Total scores between parent-to-parent dyads were correlated at $r(65) = .86$, $p < .001$, indicating strong inter-rater agreement. Subscale correlations within parent-parent dyads ranged from .50 to .82, with the challenges in social communication subscale correlated at $r(65) = .59$, $p < .001$, indicating moderate to high agreement. Total scores for parent-professional dyads were highly correlated at $r(48) = .87$, $p < .001$. Subscale correlations for parent-professional dyads ranged from .39 to .86 with the challenges in social communication subscale correlated at $r(48) = .39$, $p = .006$. Regression analyses indicate that rater agreement was not significantly influenced by the child's total social communication score, age, gender, native language, family income, rater's gender, professional type (child care provider, teacher, or ABA therapist), or professional's years of experience.

Conclusions: The high levels of inter-rater reliability across both parent-parent and parent-professional dyads indicate that the Q-SoCiAL is a reliable tool for assessing social communication skills in autistic children. The high levels of convergence across dyads who observe the children in different contexts indicate that patterns in the children's strengths and challenges in social communication across contexts were adequately captured.

**419.086** At Home Spontaneous (pre-)Linguistic Productions: Clustering Patterns to Define Language Profiles of Young Autistic Children

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Background:

Language development in autistic children varies widely, from near-typical profiles to little or no functional verbal communication. While many studies have relied on standardized measures to assess language profiles, such tests often fail to capture the full complexity of spontaneous speech. Naturalistic recordings provide a more ecological method window on autistic children's spontaneous productions in everyday contexts. Quantitative measures, such as the frequency and duration of vocalizations, provide important insights into (pre-)linguistic development in autism. However, manual coding and transcription allow for a more qualitative analysis of vocalizations, yielding a more nuanced sub-typing strategy. It is customary to categorize young autistic children as either verbal or minimally verbal, framing this as a dichotomy. However, emerging evidence suggests that language skills in autism should rather be conceived of as a continuum, with varying degrees of linguistic and pre-linguistic productions. This study contributes to this more gradual approach by examining spontaneous vocal productions in a large, bilingual sample of autistic children.

Objectives:

This research presents preliminary findings from the Belgian Language in Autism Study and explores language profiles of 88 autistic children aged 2 to 5 years from French and Dutch-speaking regions. The primary aim is to delineate the language profiles of these children by analyzing their spontaneous speech, focusing on how linguistic and pre-linguistic vocalizations may correspond to different language subtypes.

Methods:

We collected six hours of naturalistic speech recordings from each of the 88 participants. For each six-hour recordings, we selected the hour which contained the highest rate of child production, using a deep learning approach. All productions within these hour-long samples were next categorized into three types: linguistic productions (words, sentences, proto-words), pre-linguistic productions (vocalizations containing vowels but not forming full words), and other sounds (laughing, coughing). Using k-means clustering, we identified five distinct clusters based on the distribution of these vocalizations, employing the Elbow and Silhouette methods for descriptive analysis.

Results:

The figure below presents the results of our clustering analysis, which illustrates a continuum of language abilities. Cluster 2, comprising 19 participants, included children with the lowest rates of both types of vocal productions. Cluster 4, the largest group with 23 participants, represented children whose communication was predominantly pre-linguistic. Cluster 3, consisting of 16 participants, displayed a heterogeneous profile, with children exhibiting a mix of pre-linguistic and linguistic vocalizations, but still low overall language production. Lastly, Clusters 1, 5, and 6, with 13, 9, and 8 participants respectively, showed the highest rates of linguistic output, suggesting a more advanced stage of linguistic development.

Conclusions:

This study emphasizes that language abilities in autistic children cannot be easily divided into verbal and minimally verbal categories. Instead, a continuum better reflects the diversity in young autistic children's vocal productions. Future research should continue to explore both qualitative and quantitative aspects of vocal productions in autistic children to provide a more comprehensive understanding of their language development trajectory. These insights underscore the importance of studying spontaneous speech in natural contexts to capture the full range of communicative abilities in autism.

**419.087 Autistic Adult Perspectives on Self-Report Communication Measurement**

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Background: Historically, the field of autism research has centered autistic children, with parents and clinicians as primary stakeholders. However, autistic individuals have significant stakes in research priorities, and autistic adults have repeatedly pointed out the gap between their lived experiences and how researchers have characterized their experiences. While self-advocates and researchers agree that communication is often a challenge for autistic individuals, there is a gap in how the research and self-advocate communities define autism communication neurodivergences. Accurate and socially valid communication assessment tools are needed to address this gap.

The only existing self-report communication measure for adults is the Communication Checklist – Self-Report (CC-SR). The CC-SR is a 70-item self-report adaptation of the Communication Checklist – Adult, an extension of the Children’s Communication Checklist-2 (CCC-2). While the CCC-2 has been used extensively to analyze children’s communication skills and has shown utility in identifying autistic children, the CC-SR has not been validated in autistic samples. In this study, we examine autistic adults’ opinions on the CC-SR and how their perceptions of this tool can be used to improve communication measurements for this population.

Objectives: Our objective is to summarize autistic adults’ feedback on the CC-SR using quantitative content analysis, with the long-term goal of improving communication measurement in this population.

Methods: As part of a larger study on autistic adults’ experiences with nonverbal communication, N = 400 autistic adults completed the CC-SR and several other self-report measures. Participants completed surveys online and were screened for fraudulence to maintain data integrity. After completing all measures, we invited participants to provide feedback via a free-write box, reading: “If you have any general feedback about the study, please write it here (optional).” We then completed a latent quantitative content analysis of all write-ins referencing the CC-SR, with each write-in considered a single unit of analysis. The first author coded all write-ins; the senior author coded 20% for inter-rater reliability (Cohen’s κ = .63-1.00; Table 1).

Results: Although participants were not specifically asked to provide feedback about the CC-SR, 40 participants (10% of the total sample, 31% of all write-ins) spontaneously did so. Definitions and examples of codes are shown in Table 1; frequency counts are shown in Figure 1. The most common feedback related to response options’ misalignment with item wording and confusion over certain survey items. One-third of participants’ feedback provided constructive suggestions on how to improve the measure. Participants’ concerns and critiques suggest that the CC-SR is not an ideal tool for gauging communication in autistic adults.

Conclusions: These critiques highlight how existing measures developed and tested with neurotypical individuals may lack validity when administered to autistic samples. Autistic individuals must be consulted during autism measure creation to generate valid results. Measures created via community-academic partnerships, such as the Self-Assessment of Autistic Traits (Ratto et al., 2023), show promise for this approach. Outside of autism research, these results demonstrate how crucial involving target populations in the initial conceptualization and validation of measurements is for creating valid and reliable tools.



419.088 Autistic Adults’ Experiences with Nonverbal Communication Interventions

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Background:

Nonverbal communication (NVC) differences, including using and interpreting facial expressions, tone of voice, eye contact, and body language, are a core diagnostic criterion for autism. Lack of understanding and support around these differences presents significant challenges for many autistic adults. NVC provides emotional context and reinforces verbal messages, helping individuals interpret the underlying meaning of social interactions. When NVC cues are absent, misread, or misinterpreted, communication can break down leading to misunderstandings resulting in negative consequences. Despite NVC's critical role in communication, there is limited research on the availability and effectiveness of NVC interventions for autistic adults. This study examines access to, and characteristics of, NVC interventions, as described by autistic adults.

Objectives:

The primary objective of this community-based participatory research study is to assess the prevalence of autistic adults receiving NVC support and predictors of access. The secondary objective is to evaluate intervention characteristics, including the perceived helpfulness and harms of these interventions.

Methods:

Participants were 371 autistic adults aged 20-78; see Table. Using a community-based participatory research approach, we developed an online survey about NVC experiences and interventions. Those who received NVC interventions as adults shared information about their experience, including how long they received intervention, specific NVC modalities and social contexts targeted, and whether the intervention was client- (e.g., one-on-one therapy) or partner-focused (i.e., involving a communication partner). Participants rated the perceived helpfulness and harms of these interventions. We performed logistic regression to identify predictors of intervention access and collaboratively interpreted the results.

Results:

12.1% of participants (n=45) reported receiving NVC interventions as adults. Higher Autism Spectrum Quotient (AQ-10) scores predicted access to interventions ($p=0.024$). Interventions tended to be long-term (57% exceeding one year) and mostly targeted body language (82%), tone of voice (71%), and eye contact (71%). Participants reported receiving support in various social contexts, including family gatherings, job interviews, and crowded social events. Notably, 40% of participants received partner-focused interventions, involving family members, romantic partners, and employers. Helpfulness ratings, measured on a scale of 1 (most helpful) to 5 (least helpful), were mixed. Interventions targeting body language (mean=2.84) and tone of voice (mean=3.11) were rated moderately helpful, while interventions targeting eye contact (mean=4.37) were rated least helpful. Strikingly, 64% of participants who received NVC intervention as adults reported harms, with 58% indicating the intervention encouraged them to mask, leading to additional problems.

Conclusions:

This study highlights the limited access to sensitive and responsive NVC interventions for autistic adults and reveals substantial variability in their perceived effectiveness, as well as potential for harm. NVC interventions should address autistic individuals' needs and the needs of people they communicate with, in a variety of contexts. Providers must understand and respect differences in autistic NVC and minimize the risk of harm to autistic individuals. Future intervention research must actively involve autistic adults, centering their priorities, preferences, and expertise. These interventions should not only affirm autistic communication but also recognize that meaningful change will occur when mainstream society and systems are equally and actively engaged in improving communication experiences.



419.089 Autistic Prosody: Relationship between Self-Reported Experiences, Acoustic Measures, and Autism Traits

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Background:

Social communication and interaction challenges are core diagnostic criteria for autism (APA, 2012). While substantial research has investigated autistic communication—including the use of prosody (pitch, timing, volume)—minimal research has characterized autistic experiences of prosody. No work relates prosody experiences to acoustic measures of prosody production, or other validated measures of autism traits. Improving understanding of the relationship between prosody experiences and other facets of social interaction would provide novel insight into how prosody impacts autistic communication.

Objectives:

1. Characterize self-reported experiences and acoustic features (pitch and pauses) of prosody in autistic and non-autistic adults.
2. Examine the relationship between self-reported prosody experiences with prosodic acoustic features and autism traits.

Methods:

US-based adult participants were recruited via the SPARK (autism, $n=60$; 26F; $M_{age}=29.3$ years) and Prolific (non-autism, $n=51$; 27F; $M_{age}=32.6$ years) platforms and participated online after consenting.

Language- and IQ-matched participants completed an open-ended picture description task, novel self-report questionnaire about prosody experiences (co-designed with autistic consultants), and three characterization measures: language (Vocabulary Size Test; Nation & Beglar, 2012); autism traits (Comprehensive Autistic Trait Inventory; cati-autism.com); Nonverbal IQ (Test My Brain; Testmybrain.org).

The self-report questionnaire included questions about prosody experiences and self-perception of one's own prosody. Two subscores were calculated: "Composite" (16 items, describing prosody difficulties) and "Self-Perception" (5 items, rating one's own speech features (e.g., pauses, pitch)).

During the 60-second picture description task, participants described an illustration while their speech was recorded. Acoustic parameters (pitch, pauses) were extracted from the audio in 10ms increments. Silent increments were removed prior to pitch analysis. Pitch mean and standard deviation and the total duration and number of pauses were calculated for each participant.

An ANOVA was used to relate autism traits (CATI) and relevant objective acoustic measures to self-reported prosody experiences.

Results:

Responses from the prosody survey (Composite subscore) revealed that the autistic adults reported greater difficulty with prosody production and perception than non-autistic participants ($p<0.0001$). Acoustic measures of autistic speech features showed longer duration of pauses ($p<0.05$), consistent with self-report ($p<0.001$). There were no group differences in the number of pauses or in pitch. Autistic males had higher pitch than non-autistic males, and there was an interaction between sex and diagnosis for standard deviation of pitch (Figure 1). An ANOVA revealed that Composite subscores were predicted by CATI scores ($p<0.0001$) and diagnosis ($p<0.0001$), but not the extracted acoustic features.

Figure 1. A. Self-report of prosody experiences and speech features. B. Acoustic features (pauses, pitch) extracted from the picture description task.

Conclusions:

The results suggest a greater degree of self-reported challenges with prosody in autistic adults relative to language- and IQ-matched non-autistic adults. These challenges were related to autism traits but not the acoustic measures investigated in this study. Further mixed-methods research is merited to characterize additional acoustic parameters of speech across communication contexts. Examining these acoustic measures in relation to self-report of prosody and broader communication strengths and challenges (e.g. autism traits, learned strategies, masking, gender differences) will better illuminate the role of prosody in autistic social interaction.



419.090 Autistic Traits and Visual Language Proficiency Interact in Comprehending Visual Narratives

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Background: Pictures are often assumed to be “easier” for autistic individuals to understand compared to verbal stimuli. This assumption underlies the common practice of using of picture stories to support language. However, just like verbal language, understanding picture stories (hereafter “visual narratives”) requires proficiency and relies on numerous cognitive skills (e.g., theory of mind, inference generation, attention) that vary between individuals. Thus, visual narrative comprehension may not necessarily be “easier” for autistic individuals. If visual narrative comprehension is susceptible to individual differences, this necessitates a way of measuring one’s comprehension abilities, just as we measure reading abilities. While self-report measures of visual narrative experience exist, no standardized assessments of comprehension have been developed.

Objectives: To develop an assessment of visual narrative comprehension and explore whether scores are modulated by visual language fluency and/or autistic traits.

Methods: Autistic and non-autistic adults ($n=46$) were recruited as part of a larger ongoing study. Participants completed the Autism Quotient (AQ), a self-report measure of autistic traits, and the Visual Language Fluency Index (VLFI), a self-report questionnaire assessing experience with visual narratives (Table 1). The VLFI has proven valid in predicting various behavioral and neurocognitive measures of visual narrative comprehension. Stimuli were comics in three difficulty levels, with 5 comics per level: 1) Easy: Garfield comics (3 left-to-right panels; simple, concrete narrative events); 2) Medium: Peanuts comics (5-6 panels; more narratively complex storylines); 3) Difficult: Calvin & Hobbes (C&H) comics (more complex layouts; storylines based on imagination and fantasy). For each comic, participants first arranged scrambled panels into a coherent story. We coded whether they arranged panels in the same order as the original comic and how often they identified the same two sequential panels as in the original. Participants then narrated their story and we coded how well they represented the main idea of the original comic. Finally, participants completed 8 comprehension questions by selecting one of two pictures that best answered a written question (correct/incorrect). Multilevel models included *total score* on each comic as an outcome measure, *VLFI* and *AQ* as fixed effects, and *subject* and *item* as random effects.

Results: For overall comprehension scores (all levels), higher VLFI was marginally predictive of higher comprehension ($t=1.92, p=0.06$). We also analyzed each difficulty level individually. No effects of VLFI and/or AQ occurred in Garfield or Peanuts comics. For C&H, AQ and VLFI interacted ($t=-2.58, p<0.05$): increasing VLFI was associated with better comprehension on the C&H strips for participants with lower AQ ($r=0.57, p<0.01$) but not higher AQ ($r=-0.06, p=0.77$; Figure 1).

Conclusions: Participants’ overall comic comprehension was marginally associated with their comic experience, which provides preliminary evidence for our measure’s validity. Comic experience also interacted with autistic traits in the most difficult comics: VLFI was positively associated with comprehension for participants with lower but not higher AQ. These results suggest that proficiency is highly relevant for visual narrative comprehension and operates differentially for different levels of autistic traits. Thus, any use of visual narratives with autistic individuals needs to also consider visual narrative proficiency.



419.091 Beyond Caregiver Input in the Complex Syntax of Autistic Children: A Study of Ba and Bei Constructions in Mandarin
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Background: Children experience extensive exposure to caregiver utterances, though the impact of caregiver input on language development in autistic children remains debated. Some studies emphasize the importance of caregiver input for autistic children’s language development (Fusaroli, 2019; Swanson, 2020), while others suggest it plays a limited role (Chawarska et al., 2013; Green et al., 2017). However, research on the influence of caregiver input on complex syntax in autistic children is still sparse, and further exploration is needed to determine which side it supports.

Objectives: This study aims to determine whether and to what extent autistic children can learn Mandarin *ba* (e.g., *ta ba shu nazou* “He took the book away”) and *bei* constructions (e.g., *shu bei ta nazou* “The book was taken away by him”) from caregiver input. These constructions involve unique grammatical markers (*ba* and *bei*) and require advanced syntactic processing as they deviate from typical subject-verb-object (SVO) word order. Findings can inform if and how caregiver input should be adjusted to support linguistic development in autism.

Methods: Fifty-four Mandarin-speaking autistic children (mean age = 4;06) and 56 typically developing (TD) children (mean age = 2;03), matched on expressive vocabulary levels, participated in 30-minute semi-structured play sessions with their caregivers, which were recorded and transcribed using the Codes for the Human Analysis of Transcripts (CHAT; MacWhinney, 2000). Correlation analyses examined the relationship between caregiver input—specifically their use of *ba* and *bei* constructions and their mean length of utterance (MLU)—and the children’s use of *ba* and *bei* constructions.

Results: Correlations tests showed no significant relationship between *ba* production in caregivers’ speech and that of either autistic or TD children. However, a positive correlation was found between caregivers’ MLU and use of *ba* constructions by TD children ($r_s = .426, p < .01$), although not by autistic children. Children’s use of *ba* constructions was also positively correlated with their own MLU (autistic group: $r_s = .487, p < .001$; TD group: $r_s = .717, p < .001$).

Conclusions: The *ba* constructions of both autistic and TD children can be predicted by their MLU, suggesting that children’s production of complex syntax is related to their own syntactic abilities. The absence of a correlation between the use of *ba* constructions by caregivers and both autistic and TD children suggests that caregiver input of these specific constructions plays a limited role in shaping children’s use of them. However, the positive correlation between TD children’s use of *ba* constructions and their caregivers’ MLU, alongside the absence of such a correlation in autistic children, implies that the MLU of the linguistic input may enhance production of *ba* selectively in TD, while development of such constructions may depend less on such input in autism, arguably due to attentional resources. Future research could explore links between attention and syntactic development, guiding interventions that improve focus to support the acquisition of complex syntax in autism.

419.092 Caregiver Speech Input to Infants at Elevated Likelihood for Autism: An Evaluation from Speech Samples Extracted from Day Long Audio Recordings from India

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Background: Caregiver speech (CGS) input, part of bi-directional interaction with their infants, is crucial for promoting vocabulary, cognitive skills and language abilities⁽¹⁻³⁾. Evaluating CGS in infants who may have social communication and language delays (e.g., infant siblings of autistic children who are at an elevated likelihood for autism; EL-A) is important since these infants may not participate fully in this bi-directional interaction⁽⁴⁾. Most literature around CGS is in western contexts and little is known about CGS in EL-A in India. Indeed, CGS is influenced by culture. Next, most studies have used short- home/lab-based recordings that are usually based on a pre-defined context or a free play video. More recently, day-long audio recording methods (DLAR), such as Language ENvironment Analysis (LENA®), have been used to provide a more naturalistic sampling of caregiver speech (CGS). Evaluating CGS extracted from DLAR may offer insights that previous studies may not have captured.

Objectives: Thus, the current study aimed to (1) evaluate differences in CGS input provided to EL-A and low likelihood for autism (LL-A) infants between 9-12 months (2) assess the association between CGS input and infant's concurrent language abilities

Methods: Forty-seven infants (24-EL-A; 23-LL-A) between 9-12 months were recruited from NIMHANS, India. Following consent, infants completed one day of recording using LENA®. A 10-minute sample with the highest conversational turns (metric provided by LENA) was extracted. The EUDICO Linguistic Annotator software was used to segment and transcribe the sample manually whenever identifiable speech from adults were present. The following CGS parameters were assessed: quantitative - total number of words, utterance length; qualitative - total number of different words and type token ratio. A total of 470 minutes of CGS input was hand annotated. A subsample (20%) was annotated by a second annotator for inter-rater reliability (IRR). Receptive Expressive Emergent Language Test-3 (REEL-3) was used to evaluate infant language abilities. Cohen's kappa (k) was used to measure IRR. Mann-Whitney U test was used to measure CGS input between groups and partial correlation was used to understand the association between CGS input and language abilities controlling for age.

Results: IRR of .97 (strong agreement) was achieved. Groups were matched on demographic variables (**Table 1**) including age ($t=-1, p=.31$) and sex ($\chi^2=2.58, p=.10$). Results indicated significantly lower number of words (U-178, $p=.03$) and shorter utterance length (U-180, $p=.04$) in the EL-A group (**Table-1**). Amongst all CGS parameters, only total number of words showed significant correlation with receptive language ($p=.322, p<.020$) (**Table-2**).

Conclusions: Findings demonstrate that EL-A infants hear significantly fewer words and shorter utterances in their natural environment compared to infants to LL-A infants similar to findings from west^(5,6). Importantly, the correlation between total number of words spoken to the child and receptive language abilities reinforces the critical role that CGS plays in shaping early language development. Despite limited resources for annotation and prohibitive costs of DLAR devices, this study with a small sample was conducted with methodological rigor and is the first to evaluate CGS in EL-A in India that used DLAR.



419.093 Caregiver and Researcher Administration of a Naturalistic, Play-Based Communication Measure: Similarities, Differences, and Implications

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Background: Communication is a core area of need and commonly addressed skill in interventions for young autistic children. However, there are few measures designed to be sensitive to change and capture the impact of interventions. As part of a larger study, our team aimed to adapt and validate the Early Communication Indicator (ECI) for young autistic children. The ECI is a naturalistic play-based assessment administered by a familiar play partner (e.g., caregiver, teacher) that measures gestures, vocalizations, words and multiple words. It has strong psychometric properties including sensitivity to change (Greenwood et al., 2010; Buzhardt et al., 2021). The ECI-Autism (or ECI-A) adds four elicitation activities to measure initiation of joint attention (IJA) and directed communication, two aspects of communication that are common intervention goals. This tool could fill a needed gap in progress monitoring tools for communication in research and practice.

Objectives: The goal of the current study is to examine and compare ECI-A communication scores when administered by a caregiver (i.e., familiar adult) as compared to a researcher (i.e., unfamiliar adult). Examining similarities and differences in children's demonstrated communication across contexts (i.e., familiar versus unfamiliar play partner) has important implications for use of the ECI-A as an outcome measure in research.

Methods: As part of the larger validation study, a subset of young autistic children ($n=68$, 50 males), ages 20 - 60 months, participated in the ECI-A with both their caregiver and a research team member during the initial assessment. The participants were racially and ethnically diverse (44% were white, non-Hispanic) and had a range of household incomes (28% had income $< \$40K$). The ECI-A takes approximately 10-12 minutes to administer and includes 6-minutes of play with a toy set (house or barn) with four elicitation tasks that are embedded before, during, and after the 6-minute play. Play partners are directed to engage with the child and follow the child's lead during the play-based activities. The ECI-A was video-recorded and then scored by trained coders. The scores include a weighted communication rate (calculated from ECI variables of gestures, vocalizations, single words, and multiple words), a proportion of IJA (presence of IJA during each of four tasks) and mean ratings of directed communication (0-3 scale for each of four tasks). For the analyses, we examined descriptive statistics for each of the variables. We also conducted paired-sample t-tests and calculated Pearson's correlations between the same variables from the caregiver- and researcher-administered ECI-A.

Results: Most of the communication scores did not significantly differ between caregiver and researcher-administered ECI-As except for vocalizations ($t = 2.29, p = 0.025$). The correlations were all statistically significant but ranged from weak (gestures) to moderate (vocalizations, single words, IJA) to strong (multiple words, weighted communication score, directed communication). See Table 1 for full results.

Conclusions: Overall, the communication scores are similar between caregiver- and researcher-administered ECI-A. However, there are some differences (vocalizations) as well as outliers among participants. The importance of considering context (e.g., familiarity of play partner) in measurement of communication will be discussed.



419.094 Caregivers' Intervention Fidelity Via Online Learning: Early Response to Intervention and Impact on Children's Outcomes

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Background: Caregiver-mediated interventions where caregivers learn synchronously and asynchronously online have experienced rapid growth since the pandemic. However, little is understood about how caregivers are learning to implement the strategies and the impact on children's outcomes in programs adapted for online delivery.

Objectives: The objectives are: (a) to compare caregivers' early/slower response at midpoint between caregivers randomized to immediate intervention (IM) vs. waitlist (WL), and (b) within the Immediate group, examine whether caregivers' implementation at midpoint predicts children's engagement and spontaneous communication at intervention exit.

Methods: This is a secondary data analysis including 49 caregiver-child dyads from a pilot randomized controlled trial comparing immediate access to a 12-week online adaptation (self-directed learning and weekly 20-minute interventionist call) of caregiver-mediated Joint Attention, Symbolic Play, Engagement, and Regulation (JASPER: Kasari et al., 2021) intervention versus waitlist.

Participants included children ($M=56.6$ months, $SD=14.4$; Vineland ABC $M=71.0$, $SD=16.0$) with their caregivers ($n=46$ mothers, $n=2$ fathers, $n=1$ grandparent). Caregivers reported child race/ethnicity as Asian ($n=28$), Black ($n=1$), Hispanic ($n=5$), Multiracial ($n=9$), and White ($n=8$).

Caregivers ($n=33$) reported speaking multiple languages at home including Mandarin, Spanish, Greek, Russian, and Telugu.

A 10-minute caregiver-child interaction (CCX: adapted Kasari et al., 2010) was captured at entry, week-6 midpoint and week-12 exit. The Short Play and Communication Evaluation (SPACE: Shire et al., 2018) was also collected at entry and exit. Families were shipped a standard kit of CCX and SPACE toys to be used only during assessment visits. A blinded researcher joined the family synchronously on Zoom to record and support delivery of the SPACE.

Clinical Global Impressions-Severity (CGI-Severity) and Clinical Global Impressions-Improvement (CGI-Improvement) are coded from the CCX by independent reliable coders blinded to intervention allocation for caregivers' behavior including responsivity and JASPER fidelity. CGI-Severity is scored from 7 (no JASPER strategies, not responsive) through 1 (highly responsive, consistent and appropriate strategy use). CGI-Improvement indicates entry to 6-week change from 7 (significantly worse) to 1 (very much improved).

Children's time jointly engaged (JE: coordinating adult and shared activity) was coded second by second using an established protocol (Shire et al., 2015) by reliable coders ($ICC=0.88$) from the CCX. Frequency of children's initiations of gaze, gesture, and language for joint attention and requesting (total social communication: $ICC=0.82-0.91$) was coded from the SPACE. Coders were blinded to timepoint and condition.

Results: Of 47 dyads with complete data, caregivers in IM showed significantly greater reductions in CGI-Severity at 6 weeks (Fisher exact, $p<0.001$) with 14/23 rated with CGI-Improvement ≤ 2 indicating early response while 0/24 WL caregivers showed early response.

Using linear regression, within the IM group, decreased CGI-Severity score at week 6 is associated with significant increases in children's exit total social communication ($t(18)=-2.47$, $p=0.02$) and JE ($t(18)=-3.31$, $p=0.02$).

Conclusions: Caregivers are making significant gains in responsive implementation of JASPER strategies after 6 weeks of primarily self-directed learning which was associated with children's social communication outcomes. Identification of caregivers showing a slower response at midpoint can facilitate exploration of adaptive implementation strategies to personalize caregiver supports.

419.095 Caregivers' Linguistic Alignment to Autistic and Neurotypical Teenagers

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Background: Linguistic alignment refers to the reuse of a conversation partner's lexical items (LexAlign), syntactic structure (SynAlign), and/or semantic content (SemAlign)^[1]. Caregiver-to-child alignment is important: greater alignment by caregivers to neurotypical children ("NT caregivers") positively predicts their preschool-aged children's later language^[1,3]. Few studies have examined alignment by caregivers to autistic children ("ASD caregivers"), and only one distinguished alignment rate (frequency) and level (degree)^[1]. LexAlign/SynAlign rates/levels, as well as SemAlign levels, were higher in NT than ASD caregivers, and ASD caregivers' alignment rates/levels were positively correlated with their preschool-aged children's expressive language (EL)^[1]. It is unknown the extent to which caregivers align similarly or differently with their children, either neurotypical or autistic, during adolescence.

Objectives: To investigate group differences in rates and levels of caregiver-to-child alignment, as well as relationships with teenagers' EL. We also examine a longitudinal subset to determine whether early caregiver-to-child alignment relates to caregiver-to-child alignment in adolescence.

Methods: Caregivers played the Aliens Game^[4] with their adolescent children: 24 NT ($M_{age}=15.84$ years) and 19 autistic ($M_{age}=17.47$ years) teenagers whose EL^[5] raw scores differed (NT: $M(SD)=206.50(19.35)$; ASD: $M(SD)=144.37(66.13)$; $p<.001$). Dyads decided together whether to ask for a gem, steal one, run away, or hide from each of 40 cartoon aliens. The longitudinal subset's (NT: $N=18$; ASD: $N=14$) conversational data came from 30-minute parent-child play sessions when children were preschool-aged (NT $M(SD)_{age}$: 40.70(1.40) months; ASD $M(SD)_{age}$:

52.11(6.45) months). At both timepoints, conversations were recorded and transcribed, then analyzed using ALIGN^[6], an open-source alignment-calculating package. Mean caregiver-to-child alignment rate (number of the caregiver's turns in which any LexAlign/SynAlign occurred, divided by their dyad's total turns) and level (mean LexAlign/SynAlign/SemAlign value in turns with nonzero alignment) were calculated. Because LexAlign contributes to SynAlign/SemAlign, we controlled for LexAlign in analyses involving SynAlign/SemAlign.

Results: ASD and NT caregivers did not differ in LexAlign rate or SynAlign/SemAlign level ($ps>.210$). However, ASD caregivers had higher SynAlign rates than NT caregivers ($p=.020$, $F=5.92$, $\eta^2=0.13$), while NT caregivers had higher LexAlign levels than ASD caregivers ($p=.002$, $F=10.93$, $\eta^2=0.21$; Figure 1). Caregivers' LexAlign level and teenagers' EL^[5] raw scores were positively correlated (NT: $r=0.41$, $p=.044$; ASD: $r=0.54$, $p=.017$; Figure 2a). Longitudinal analyses revealed significant positive correlations between early and current caregiver-to-child LexAlign rates for both groups (NT: $r=0.48$, $p=.042$; ASD: $r=0.61$, $p=.021$; Figure 2b); no other significant relationships emerged ($ps>.054$).

Conclusions: Alignment analyses revealed both similarities and differences across groups: ASD caregivers reused their children's syntax more often, but NT caregivers reused more of their teenagers' words. Possibly, ASD caregivers were more focused on keeping their teens "on task" whereas NT caregivers were more focused on their teens' content. As teenagers' EL levels increased, more of their words were reused by their caregivers (LexAlign level); caregivers overall may have felt that alignment would be more fruitful with teenagers who used more complex language. Finally, caregiver-to-child LexAlign rate appeared to be stable from childhood to adolescence in both groups, suggesting that caregivers who initially provided more conversational scaffolding via frequent word reuse continued to do so over a decade later.



419.096 Characterizing Relationships between the Linguistic Complexity of Caregiver Input and Autistic Children's Expressive Language: Beyond Mean Length of Utterance

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Background: Caregiver language input plays an important role in the broader language development of autistic children (Bang & Nadig, 2015; Fusaroli et al., 2019). Prior research has demonstrated that caregivers of neurotypical children, children with Down Syndrome, and children with language impairments fine-tune their linguistic input based on their children's language level (Bird & Cleave, 2016; Leung et al., 2021). Traditional language sample analysis approaches heavily rely on Mean Length of Utterance (MLU) as a measure of linguistic complexity. However, means are not sensitive to spread or variability in data. Thus, MLU may obscure some important information. Better understanding how caregivers of autistic children adjust their linguistic input based on their child's language level will provide important information to guide parent-implemented language interventions.

Objectives: Examine a novel approach to characterizing the linguistic complexity of caregiver input to autistic children and investigate relationships between parent- and child-level linguistic complexity measures.

Methods: Participants were 29 autistic children (6 F) and their caregivers who participated in a larger study. An experienced clinical team confirmed children's autism diagnoses using the Autism Diagnostic Observation Schedule, Second Edition (ADOS-2; Lord et al., 2012) and clinical judgement. Children were between two and five years old ($M = 43.52$ months; $SD = 10.51$). Caregiver-child dyads participated in 10-minute play-based language samples with a standard set of toys. Samples were transcribed and analyzed using Systematic Analysis of Language Transcripts software (SALT; Miller & Nockerts, 2024). Measures included (for both caregivers and children): Range of Length of Utterance (RLU; Longest Utterance – Shortest Utterance), Total Utterances (TU), Standard Deviation of Length of Utterance (SDLU), and Mean Length of Utterance (MLU). Each measure was computed in morphemes, from all complete and intelligible utterances.

Results: For each measure, we fit a linear regression in which the dependent variable was the caregiver-level complexity measure (RLU, TU, SDLU, MLU) and the independent variable was the corresponding child-level measure. Independent variables were mean-centered for all models. Results revealed that child RLU significantly predicted caregiver RLU ($\beta = 1.71$, $t = 2.898$, $p < .01$, Fig.1), child SDLU significantly predicted caregiver SDLU ($\beta = 0.356$, $t = 5.701$, $p < .001$, Fig.2), and child MLU significantly predicted caregiver MLU ($\beta = 0.514$, $t = 4.827$, $p < .001$). Children who produced zero utterances ($n = 4$) were excluded from the MLU model, as an MLU could not be calculated. Children who produced one or fewer utterances ($n = 7$) were excluded from the SDLU model as standard deviation could not be calculated. Child TU did not significantly predict caregiver TU ($\beta = 7.435$, $t = 0.805$, $p = .428$).

Conclusions: Results suggest that variability in utterance length may be a useful measure of linguistic complexity as a complement to MLU and that caregivers adapt the linguistic complexity of their input, but not the total quantity of input, based on the complexity of their autistic children's expressive language, in real time.

**419.097** Comparing Social Communication and Interaction during Structured and Unstructured Activities in Verbal and Minimally Verbal Autistic Children

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Background: Social communication and interaction difficulties are core symptoms of autism spectrum disorder. However, little is known about whether the quality and quantity of social communication and interaction in autistic children are affected by the type of activity and whether this association differs between verbal and minimally verbal (MV) autistic children. It also remains unclear how executive function and language skills interact to affect naturalistic social communication and interaction in verbal and MV autistic children.

Objectives: Comparing the quality and amount of social communication and interaction during structured versus unstructured activities in verbal and MV autistic children; Examining the association between executive function, language skills, social communication and interaction between verbal and MV autistic children.

Methods: 31 verbal (ADOS Mod 2/3) and 23 MV (ADOS Mod1) autistic children ($M_{age} = 4.87$ years, ranging from 3.5 to 6.8) were included in this study. A four-point Likert scale was adapted from the original ADOS protocol to code the quality and amount of social overtures, the quality of social responses, and the overall quality of social rapport in one structured and one unstructured activity from ADOS Mod 1 to 3, with lower scores indicating fewer social communication difficulties. Structured activities with specific sequences and prompts include a birthday party in Mod 1 and 2 and an interview in Mod 3. Unstructured activities include free play in Mod 1 and 2 and joint-interactive play in Mod 3. Two ADOS-reliable coders reached intraclass correlation coefficients from 0.84 to 0.96 across all coding. Executive function was reported by parents on the BRIEF-P. Receptive language was assessed using the PLS-5, and the number of different words (NDWs) was derived from another natural language sample. Linear mixed models with a random intercept of each participant tested whether the effect of activity type on social communication variables differs between verbal and MV autistic children. Multiple regression models were used to test the association between the study variables.

Results: MV autistic children initiated more social overtures during unstructured than structured activities, $\beta = -0.33$, $p = 0.04$, and had better overall quality of social rapport in unstructured activities, $\beta = -0.39$, $p = 0.01$, while neurotypical children did not show significant differences (Figure 1). Better executive function and receptive and expressive language were associated with better social communication and interaction in the whole autistic sample (Figure 2). After taking verbal status into account, receptive language emerged as the single significant factor predicting the quality ($\beta = -0.02$, $p = 0.03$) and amount of social overtures ($\beta = -0.02$, $p = 0.02$) and the overall quality of social rapport ($\beta = -0.02$, $p = 0.005$, but not the quality of social response) in MV autistic children. MV autistic children with better emotional control had fewer changes in their quality of social responses between structured and unstructured activity, $\beta = 0.03$, $p = 0.03$.

Conclusions: Unstructured activity with toys at different play levels and without specific prompts facilitates social overtures and improves social rapport in MV autistic children during naturalistic interactions. Better emotion regulation helps maintain a stable social response quality in MV autistic children, and better receptive language supports their social overtures and overall social rapport.



419.098 Conversational Topic Management in Autistic and Typically Developing Children: Evidence from Spanish
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Background: The present study is the first to examine topic maintenance and topic shifts in Spanish-speaking autistic and typically developing (TD) children. Keeping track of the interlocutor's previous topic is an essential skill to engage in coherent conversations. Notably, off-topic responses can lead to negative social judgments and consequences (McGuinness et al., in press; Abbot-Smith et al., 2024). While research suggests that autistic children face greater challenges than TD children in elaborating on immediately prior topics (Ying-Sng et al., 2018), a recent study by Abbot-Smith et al. (2024) found both groups equally capable. Furthermore, research specifically addressing topic shifts is scarce and often mixed with other variables (Ying-Sng et al., 2018). Given that social interaction challenges are a core aspect of autism, grasping the nuances of conversational topic management is particularly relevant.

Objectives: This study aims at contributing to the understanding of conversational dynamics in autistic children, focusing on the similarities and differences they exhibit compared to TD children in topic maintenance and topic shifting.

Methods: Participants included 43 autistic and 45 TD Spanish-speaking children (5.6-12.11 years), matched on chronological age ($W = 1059, p = 0.45$). Autistic children had a non-verbal IQ above 80 in the Leiter-3 ($M = 105, SD = 10.6$), and age-appropriate receptive vocabulary (Peabody scores: $M = 101, SD = 21.1$). Each child engaged in a 25-minute semi-spontaneous conversation with the examiner using the *Eliciting Language Samples for Analysis* protocol (Barokova et al., 2021). We developed our own coding scheme (particularly expanding on topic shifts), while reanalyzing some of our variables to align with Abbot-Smith et al. (2024). Coded response types included: contingent responses (elaborating on the previous topic), minimal (topic-supporting responses without elaboration, e.g., "yeah"), topic shifts, missing, and other (not fitting into any other category).

Results: A negative binomial regression, controlling for age and total number of conversational turns, revealed significant group-response type interactions. Post-hoc analyses indicated that autistic (ASD) children produced significantly more topic shifts ($\beta = 1.31, SE = 0.17, z = 7.83, p < .001$), missing responses ($\beta = 0.89, SE = 0.14, z = 6.33, p < .001$) and other responses ($\beta = 0.95, SE = 0.15, z = 6.29, p < .001$). No significant differences were detected for minimal ($\beta = -0.24, SE = 0.13, z = -1.90, p = 0.06$) and contingent responses ($\beta = -0.07, SE = 0.13, z = -0.58, p = 0.57$). Results are illustrated in Figure 1, with summary statistics in Table 1.

Conclusions: Our findings suggest that autistic children can effectively maintain and develop the interlocutor's previous topic. However, they still deviate from the topic more frequently than TD children. These results raise the possibility that when TD kids do not fully grasp the conversational topic, they tend to give minimal responses, while autistic children go for shifting topics. The next step in our research will involve examining the types of topic shifts children produce, which may provide further insights. Results will be available at the conference.



419.099 Cross-Context Question-Asking in Autistic Children: Frequency, Form and Function

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Background: Literature on question-asking behaviors in autistic children has predominantly focused on interventions designed to increase question-asking frequency. There is a gap in the autism literature concerning question-asking behaviors in young children. Recent research has shown that autistic children ask questions to serve similar functions as their typically developing peers but at a significantly lower rate (Luyster et al., 2023). However, little is known about the contextual influence on question-asking behavior in autistic children.

Objectives: This study aimed to investigate the frequency, form, and function of questions produced by autistic children in semi-structured and unstructured contexts.

Methods: English-speaking autistic children 4;3-6;6 years old participated in (1) a semi-structured question-eliciting task on a tablet using Greif et al.'s (2006) protocol and (2) a naturalistic play session. In the semi-structured task, children were presented with images of unfamiliar animals and objects and invited to ask as many questions as they liked. In the naturalistic play session, children and their caregiver(s) were provided with playdough, snack boxes, unfamiliar objects, magna tiles, and three books. Each session was transcribed and question form and function were coded by trained examiners.

Results: Data collection was completed with 15 participants. Their average age was 5;6 years ($SD=10.08$ months); the group had an average NVIQ of 95.93 ($SD=27.90$) and expressive language score on the CELF P2 of 97.20 ($SD=17.13$). Preliminary analyses are included and mostly descriptive; further analyses will be conducted in the months ahead. Children asked 111 questions during the semi-structured task and 344 questions during the naturalistic play session. When adjusted for task duration (in minutes), children asked an average of .81 questions/minute ($SD=1.10$) during the semi-structured task and 1.09 questions/minute ($SD=.64$) during the play session. A within-subjects Cohen's d revealed a small difference between conditions ($d=.22$), although a Wilcoxon signed-ranks test indicated that the two conditions were not significantly different ($Z=1.10, p=.272$). During the semi-structured task, 11% of questions were yes/no, 85% were wh-, and 4% were intonation-based. During the play session, 38% of questions were yes/no, 50% were wh-, and 9% were intonation-based. During the semi-structured task, 95% of questions were information-seeking, 5% were initiation and maintenance, and <1% were directive. During the play session, 55% of questions were information-seeking, 24% were initiation/maintenance, and 14% were directive.

Conclusions: While context does not significantly impact the question-asking rate of autistic children, context can contribute to variability in question form and function. Variability in question form/function across settings is a novel finding that advances previous literature to suggest autistic children are adapting their inquiries to the context. Autistic children appear to have a wider variety of questions during play-based, low-expectation interactions with a familiar communication partner. Contextual effects should be considered in characterizing and supporting active learning in autistic children.

419.100 Developing a New Toddler Measure of Social Communication for Use in a Clinical Trial Initiated during COVID-19: My Toddler's Social Communication (MTSC)

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Background:

The onset of COVID-19, which ushered in an era of mandated social distancing, had a profound impact on researchers conducting clinical trials. Many established in-person measures of social communication were not feasible, creating a need to pivot to new approaches for measuring social communication. Our research group embarked on a large, multi-site, community-based clinical trial involving Part C Early intervention (EI) providers, toddlers, and their caregivers in the midst of the initial stay-at-home mandates. One inclusion criterion was that toddlers display either social-communication challenges or an increased likelihood for autism. Unable to use the planned interactive screening tool for autism, we developed a new caregiver-report measure, My Toddler's Social Communication (MTSC). Our priorities for the MTSC were that it be relatively brief, include photos along with simple written descriptions of each social communication behavior, and illustrate cultural diversity. The final version comprised 11 items (See Example) and one question about social communication concern.

Objectives:

To examine psychometric properties of the MTSC including the factor structure, internal consistency, sex differences, and concurrent validity.

Methods:

Participants (N=328) were referred to the study by their EI providers, who had enrolled in an ongoing implementation/effectiveness trial in Part C early intervention programs. Providers referred families when they had concerns about the children's social communication. Caregivers were diverse with respect to race, ethnicity, education, and poverty status (See Table 1). Children (68.1% boys; 31.9% girls) were between 16- and 35-months of age (mean=25.9, SD=4.04). Caregivers completed the initial screening questionnaires for the study, which included the MTSC, the Brief Infant-Toddler Social Emotional Assessment (BITSEA; Briggs-Gowan & Carter, 2006), a nationally normed autism and mental health screening tool, and demographic characteristics.

Results:

An exploratory factor analysis yielded a single factor solution, (Eigen Value=4.61) with factor loadings ranging from .481 to .750 (Mean=.629). Consistent with a single factor, Cronbach's alpha for the 11 items was .876. There were no child sex differences for the total scale, with two items significant with small effect sizes. Boys were rated higher on "Looks at you to share his or her enjoyment" (Cohen's $d=.25$), while girls were rated higher on "Used toys as if they were the real object" (Cohen's $d=.28$). There were no caregiver education effects for the full MTSC scale, with two items significant with small effects sizes. Caregivers with college degrees rated their children higher on two pointing items, (i.e., seeking help and sharing interest) than less educated caregivers, (Cohen's $d=.276$ and $.248$). The MTSC was correlated significantly with BITSEA autism competence and problem scores ($r_s = .77$ and $-.48$ respectively). The number of caregivers who rated concern about social communication was 264 (80.5%) with 64 reporting no concern (19.5%).

Conclusions:

Preliminary analyses of the MTSC in a highly diverse sample of caregivers provide strong evidence for high internal consistency and concurrent validity. There was some evidence for individual item differences for child sex and caregiver education, but none for caregiver race/ethnicity effects. Future work in the larger study will focus on predictive validity to autism diagnosis.



419.101 Developing a Sense of Meaning: Changes in Neurophysiological Correlates of Semantic Comprehension during Language Maturation in Children with and without Autism

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Background: Comprehending language requires understanding the meaning of individual words and their context within a sentence. How one processes this semantic information can be measured by changes in amplitude of the N400 event related potential (ERP) and late positivity component (LPC/P600), both of which are robustly evoked when errors are introduced into sentences. Additionally, functional magnetic resonance imaging (fMRI) studies show that different areas of the brain are activated in response to changes in semantic congruency, including the Inferior Frontal Gyrus (IFG) and Superior Temporal Gyrus (STG). Throughout typical language development, a child's semantic processing skills are refined. This is reflected in amplitude and latency decreases of these ERP components and broad activation becomes localized to language areas with adult like patterns appearing between 10-12 years. Behavioral research suggests that individuals with autism often have developmental language differences including difficulty comprehending pragmatic and semantic information. Studies using neurophysiological or neuroimaging methods also generally show atypical responses to language information. However, there is no consensus on whether the N400 and/or the LPC/P600 are present, altered, or absent in individuals with autism among these studies, and few have investigated the development of auditory semantic comprehension across childhood using both electroencephalography (EEG) and fMRI. Paired with cognitive measures, this research could inform whether language differences in children with autism are due to a language delay, an alternative language trajectory, or both.

Objectives: The purpose of this study was to characterize the development of auditory semantic comprehension in children with and without autism utilizing EEG and fMRI across 4 age bands.

Methods: Brain activity was recorded via EEG and fMRI while auditory sentences with and without semantic errors were played (stimuli from Toffolo et al. 2022). Responses were compared between neurotypical (NT; n=38) and autistic (n=25) children across four age bands: 6-7, 8-9, 10-12, and 13-15 years.

Results: The N400 and LPC/P600 ERP components of both groups matured throughout language development in response to semantic errors, showing reductions in amplitude and latency with age. There were also differences in functional activation between older and younger children, with older children showing activation in the IFG and STG in response to semantic errors. Interestingly, the N400 ERP component of older children with autism had reduced amplitudes when compared to their NT peers. However, these amplitudes were similar to younger NT children, making older autistic children appear to have "younger" ERPs. Functional activation was also different between groups, with activation only in the LIFG of NT children but bilateral IFG activation in autistic children.

Conclusions: Preliminary data show effects of semantic congruency and age on activation and ERP response amplitude, latency, and topography. Albeit a small sample size, there are differences in activation and N400 component amplitude between older children with and without autism. These data suggest differences in how semantic information is processed children with autism and how these skills develop. Once completed, the outcomes of this study will provide information on developmental language trajectory with complementary information from fMRI and EEG methodologies.

419.102 Developing an Augmentative and Alternative Communication (AAC) Lab and Lending Library in a Low-and Middle-Income Country (LMIC)

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Background:

The challenges with providing communication services in LMICs like Sri Lanka are significant. An increasing number of families with children with communication difficulties are using iPads and other tablet and mobile technologies as AAC systems (Caron, Costello, & Shane, 2014). The use of this type of technology has been successful in providing children with communication difficulties unique ways of communicating using communication apps.

Objectives:

The purpose of this study was to describe the processes involved in the development of an AAC lab and lending library to serve individuals with autism in a LMIC. We will provide descriptive statistics of patterns of consumer use and activities undertaken by the lab. The AAC lab called Dhvani, and lending library could be a good model for other professionals in other LMICs to replicate in their settings.

Methods:**1). Establishment of the AAC lab - Dhvani:**

The AAC lab Dhvani was established through two external grants in May 2020. One grant enabled the purchase of a laminator and a printer to be used to develop low-tech AAC materials. The second grant enabled the purchase of tablet devices and communication apps. This includes Avaz Sri Lanka a communication app that was developed specifically for the Sri Lankan population in the two local languages spoken in Sri Lanka.

2). Creating awareness and training:

Currently, there is very limited awareness regarding AAC in Sri Lanka (Muttiah et al., 2021). This is among both professionals and parents. The Dhvani lab provides both awareness and training among caregivers.

3). Lending library:

The lending library allows families the opportunity to loan tablet devices with AAC apps to trial at home for a period of 1 month (and more). This allows the families to see the usability of the AAC device or assistive technology tool with their child in a real-world situation.

Results:

Results will be presented on each of the four areas mentioned above drawing from data collected over the past 4 years.

1). Establishment of the AAC lab - Dhvani:

The lab has provided access to AAC and other assistive technology equipment. The lab has developed 113 low-tech AACs for families. High-tech AAC apps were trialed with 306 children with CCN. Other types of assistive technology have been trialed with 5 children with disabilities.

2). Creating awareness and training:

The lab has trained over 275 parents of children with CCN on how to use high-tech AAC apps. The lab has conducted 9 parent workshops. A total of 693 participants have attended the workshops conducted through the Dhvani lab.

3). Lending library:

The assistive technology lending library has loaned tabs with communication apps to 115 children with disabilities. The lab has loaned other types of assistive technology equipment to 2 children with disabilities. In addition, the lab was able to source donations of tablet devices and apps for 14 children who were not able to afford it.

Conclusions:

The Dhvani lab and lending library have resulted in many children with CCN having access to AAC services.

419.103 Differences in Basic Auditory Processing and Expressive Language in Autistic Youth with and without History of Late Talking

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Background:

Some children with autism have a history of being late talkers, some of whom eventually catch up in their language development while others do not. Delayed cortical auditory response and impaired rapid auditory processing have been associated with verbal abilities in ASD; however, our understanding of the developmental onset and consequences of these auditory differences is still emerging.

Objectives:

We examined performance on neuropsychological measures of rapid auditory processing and auditory reaction time in relation to both history of late talking (LT) as well as current language abilities in typically developing controls (TDC) and youth with ASD to understand the relation of auditory deficits to historical presence of speech delay and persistence of expressive language impairment (ELI).

Methods:

Participants were 128 children and adolescents ages 8-17 years (43 TDC; 56 ASD-LT; 29 ASD+LT). LT history was defined by first words after 18 months, phrase speech after 36 months, and/or 6-8-word sentences after 48 months. Participants with current CELF-5 Expressive Language Index score below 80 were additionally classified as having current ELI.

Group differences were examined on measures of rapid auditory processing (SCAN-3 Gap Detection test) and auditory reaction time (CATA). Correlations were performed between these scores and CELF-5 Expressive Language Index, mean auditory and visual naming response times (AVNT-C), and rapid naming speed (NEPSY-II). Lastly, we subdivided groups based on LT history and current ELI to examine auditory group differences in those whose language delays did versus did not resolve. Bonferroni corrections were applied to significance thresholds to control for familywise error.

Results:

The ASD+LT group had significantly lower Expressive Language scores compared to both the TDC and ASD-LT groups ($p < 0.001$). Within the ASD+LT group, 48.3% had current ELI (Table 1).

The ASD+LT group had slower auditory reaction times and poorer rapid auditory processing ($p = 0.016$) compared to the TDC group. Additionally, slower auditory reaction time was associated with lower Expressive Language scores in both ASD groups (ASD+LT: $\rho = -0.476$, $p = 0.014$; ASD-LT: $\rho = -0.286$, $p = 0.033$). Furthermore, better rapid auditory processing performance was associated with higher Expressive Language ($\rho = 0.372$, $p = 0.047$) and rapid naming scores ($\rho = 0.406$, $p = 0.036$) in the ASD+LT group.

Finally, we explored auditory processing differences based on LT history and current ELI (Table 1). The ASD-LT+ELI group was not included in these analyses because only 4 participants met these criteria. Compared to TDC and ASD-LT-ELI, the ASD+LT+ELI group had significantly slower auditory reaction times (ASD-LT-ELI: $p = 0.0008$, TDC: $p = 0.0003$) and worse rapid auditory processing (ASD-LT-ELI: $p = 0.0035$, TDC: $p = 0.0004$). Analyses were not sufficiently powered to detect statistically significant differences between the two LT groups; however, compared to the ASD+LT-ELI group, ASD+LT+ELI group had on average, slower reaction time (ASD+LT+ELI: $M = 52.33$, $SD = 13.153$; ASD+LT-ELI: $M = 43.06$, $SD = 9.692$) and worse rapid auditory processing (ASD+LT+ELI: $M = 5.92$, $SD = 2.466$; ASD+LT-ELI: $M = 6.69$, $SD = 2.774$) (Figure 1).

Conclusions:

Basic auditory processing was associated with history of LT and current expressive language abilities in autistic youth. Continued auditory dysfunction may play a role in the persistence of language impairment in children who were late to talk.



419.104 Early Joint Attention Abilities Predict Subsequent Expressive Language Abilities in Young Autistic Children

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Background: Most autistic children exhibit early language delays with 25-30% remaining minimally verbal (MV) throughout life. Hence, expressive language is a key area for early intervention that is critical for successful outcome. Previous studies have suggested that autistic children with better social communication and joint attention abilities early in development were more likely to successfully develop expressive language abilities later.

Objectives: To identify early predictors of expressive language development in MV 1-4-year-old autistic children using ADOS-2 and cognitive test variables at diagnosis.

Methods: We analyzed retrospective data from 101 children (83 boys), 13-50 months old at diagnosis ($M=27.4$, $SD=7.20$). All children completed two ADOS-2 assessments, one at diagnosis and another at follow up, 12-24 months later. We used the coding system developed by Visser et al., (2017) to create a common 8-point scale across ADOS-2 modules, thereby transforming A1 item scores into scores ranging from 0 (Children use sentences in a largely correct fashion) to 7 (No language production at all). All the selected children in the current study were classified as MV at diagnosis according to this scale. Children were divided into three groups based on their verbal ability at follow-up: MV (scores 6-7), one-word phase (scores 4-5), phrases (scores 2-3) and fluent speech (0-1). Joint attention (JA) was calculated according to the scale developed by Gotham et al. (2007), by summing the following 6 items from the different ADOS-2 modules: Pointing, Gesturing, Showing, Initiation of Joint Attention, Unusual Eye Contact, and Reaction to Joint Attention.

Results: Children who developed expressive language abilities at follow-up (scores of 0-5) had significantly higher ADOS-2 Social Affect (SA) Calibrated Severity Scores (CSS) at diagnosis ($F(2, 98)=5.531$, $p=0.005$). Logistic regression models revealed that both ADOS-2 SA-CSS (Estimated=0.46, $SE=0.33$, $p=0.007$, $OR=2.44$, 95% CI [1.33, 4.95]) and JA (Estimate=0.22, $SE=0.31$, $p=0.013$, $OR=2.16$, 95% CI [1.22, 4.19]) scores, at diagnosis, were significant predictors of expressive language abilities at follow-up. In contrast, cognitive scores and ADOS-2 Restricted and Repetitive Behaviors (RRB) CSS at diagnosis did not differ significantly across children who remained MV or developed expressive language. Additionally, when analyzing changes in ADOS-2 SA-CSS, ADOS-2 RRB-CSS, and JA scores over time, only the changes in JA scores showed a significant difference between groups ($F(97, 2) = 9.65$, $p = 0.001$).

Conclusions: In line with previous studies, we demonstrate that early social abilities and primarily joint attention abilities are associated with better development of expressive language in preschool autistic children (i.e., "the rich get richer"). This demonstrates that JA scores extracted from the ADOS-2 represent a meaningful prognostic measure for estimating outcome, as proposed previously with more elaborate methods for assessing JA. Further studies examining these predictors in different intervention settings are highly warranted.

419.105 Early Word Acquisition Predicts Cognitive Ability, Adaptive Behavior, and Symptom Severity in Young Children with Autism Spectrum Disorder

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Background: Autism spectrum disorder (ASD) involves deficits in social communication and interaction. While language delay was a core symptom in DSM-IV, it's now a specifier in DSM-5 due to variability in language development. Researches link language ability to cognitive abilities, adaptive behaviors, and symptom severity, with early acquisition predicting outcomes. This study explored how early language development predicts future abilities in ASD, emphasizing the need for early intervention.

Objectives: The study aimed to (1) determine if early word production in young children with ASD affects follow-up outcomes in cognitive abilities, adaptive behaviors, and autistic symptoms; (2) whether the age of word acquisition is the best predictor of later outcomes; and (3) whether the Mullen Scales of Early Learning (MSEL) or the Autism Diagnostic Observation Schedule, Second Edition (ADOS-2) is a better tool for measuring word production.

Methods: This study recruited 158 young children with ASD (134 boys, 24 girls) aged 17 to 35 months at Time 1, along with their parents. Follow-up assessments were conducted 12 to 19 months later at Time 2. Children were divided into three age-based groups: Group 1 (< 25 months), Group 2 (25-29 months), and Group 3 (≥ 30 months). Language ability at Time 1 was assessed using MSEL and ADOS-2. At Time 2, cognitive abilities and four sub-scales were measured by MSEL, autistic symptom severity by ADOS-2, and adaptive behaviors by the Vineland Adaptive Behavior Scales, Third Edition (VABS-III) or the Adaptive Behavior Assessment System, Second Edition (ABAS-II), completed by parents.

Results: Children from all three groups who produced words by Time 1, as measured by MSEL, consistently showed better performance at Time 2 in developmental quotient (DQ), MSEL sub-scales, and adaptive behaviors. Similar patterns were observed in young children assessed by ADOS-2, who consistently showed higher DQ, sub-scale scores, adaptive behaviors, and certain autistic symptoms at Time 2. Compared to MSEL, ADOS-2 better predicted autistic symptoms, with spoken words leading to significantly better performance. Moreover, significant differences were observed across all groups, with earlier word expression linked to better developmental outcomes. Children who had spoken words by 24, 29, and 35 months all showed superior performance across these domains compared to those who began speaking after 36 months. Upon closer examination, the MSEL data revealed that children who began using words before 25 months showed significantly preferable outcomes in language expression ($p=.027$), overall language development ($p=.041$), adaptive behaviors ($p=.020$), communication ($p=.009$), and socialization ($p=.032$) compared to those who spoke after 30 months. Children in the 25-29 month group performed finer than those in the 30-month group in communication skills ($p=.039$).

Conclusions: This study emphasized the significance of early language emergence in young children with ASD, with earlier word expression predicting better cognitive, language, and adaptive outcomes. The findings highlighted the importance of early intervention to improve developmental trajectories in them.

419.106 Encoding of Sentiment in Autistic and Non-Autistic Adults

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Background: The salience of social/emotional experiences has implications for whether and how emotional association, or sentiment, is encoded during language development. If these experiences are less rewarding for autistic compared to non-autistic people, this could lead to differences in how strongly sentiment is encoded during language learning; that is, how strongly sentiment is bound to vocabulary. This study investigates sentiment encoding using two-word phrases that are either congruent, where both words share the same sentiment as each other and as the resulting phrase (e.g., "super awesome", "ugly downfall"); or incongruent, where one positive and one negative word combine to produce phrases that are either positive (e.g., "bloody hilarious") or negative (e.g., "super pissed"). Understanding the strength of sentiment encoding can provide valuable information regarding how social/emotional stimuli are processed.

Objectives: This study investigated sentiment encoding by having autistic and non-autistic people make sentiment judgements about two-word phrases. We hypothesized that if sentiment was tightly bound at the word-level, then two-word phrases where both words have similar sentiment (i.e., congruent), would be quickly categorized; and incongruent phrases, where the two words have opposite sentiment, would induce cognitive interference leading to longer judgement times compared to congruent phrases.

Methods: Data from 26 autistic (7 male; mean age = 27.04 ± 7.10 years) and 17 non-autistic (9 male; mean age = 26.53 ± 6.92 years) adults were used in the study. Groups were matched for age, gender, and language and reading abilities. Stimuli comprised 60 unique phrases presented in random order, three times each, using rapid serial visual presentation; totaling 180 trials. Participants judged each stimulus as positive or negative while we captured response times and accuracy. One participant's data from each group had been excluded due to <95% accuracy. For remaining participants, only accurate trials with response times >250 ms or within 3SD of each participant's average were included. Paired t-tests were used within each group to determine whether incongruent phrases required significantly longer to judge than congruent phrases.

Results: Independent samples t-tests indicated no difference for number of unusable datasets (autistic=1.02%, non-autistic=0.98%) or trials (autistic=3.57%, non-autistic=5.6%) between the groups (both $p < 0.05$). The non-autistic group required longer to judge incongruent (mean = 1678.38, SD = 306.55) than congruent (mean = 1614.37, SD = 299.27) phrases ($t(16) = -1.83$, $p = 0.04$). Similarly, the autistic group required longer to judge incongruent (mean = 1634.38, SD = 270.36) than congruent (mean = 1584.30, SD = 282.18) phrases ($t(25) = -2.23$, $p = 0.02$). However, unique to the autistic group, there was a trend between higher autism spectrum quotient scores and larger incongruency effects ($r = 0.38$, $p = 0.06$).

Conclusions: This study enhances understanding of sentiment encoding and language processing. Our findings indicate that both autistic and non-autistic people encode sentiment at the word level despite different social/emotional experiential salience during development. However, in autistic individuals there was a positive relationship between number of autistic-like traits and amount of cognitive interference, suggesting potential processing differences or strategies. Our findings suggest that individual differences in autistic traits influence the processing of sentiment in language.

419.107 Enhancing ASD Detection with Machine Learning and Deep Learning: Insights from Eye-Tracking Data during Audiovisual Speech Perception

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Background: Accurate and early diagnosis of Autism Spectrum Disorder (ASD) is beneficial for providing appropriate and timely interventions, especially for children. Traditional diagnostic protocols based on behavioral observations can be subjective and time-consuming, leading to inaccuracies as well as delays in diagnosis. Recent advancements in machine learning and deep learning offer the potential to improve diagnostic efficiency by analyzing more refined and complex data such as eye movements.

Objectives: This study aims to develop and evaluate a hybrid approach combining machine learning and deep learning techniques to classify children with ASD from their typically-developing (TD) peers based on eye-tracking data. By leveraging both time-series data and image-based features, the objective is to create a model with high diagnostic accuracy.

Methods: Eye-tracking data collected from 70 Hong Kong Cantonese-speaking children (26 diagnosed with ASD) aged 7 to 12 years when completing audiovisual speech perception tasks. Eye movements when scanning the talking face of a female speaker were processed as time-series data for machine learning models and as heatmaps and trail maps for deep learning. The machine learning approach involved feature engineering and training ensemble models combining Support Vector Machines (SVM), K-Nearest Neighbors (KNN), and Random Forest through voting or meta-classifiers. For the deep learning approach, Convolutional Neural Networks (CNNs) were trained on eye-tracking heatmaps and trail maps. The two approaches were combined to maximize diagnostic performance.

Results: The combined machine learning and deep learning approach achieved a satisfactory accuracy of over 95% in diagnosing ASD. The ensemble models provided robust performance on time-series data, while CNNs effectively captured spatial patterns from eye-tracking heatmaps. The integration of both methods significantly improved the overall accuracy and robustness of the diagnostic tool.

Conclusions: Our hybrid approach of combining traditional machine learning with deep learning models offers a promising method for improving the diagnosis of ASD in children. The use of eye-tracking data as a non-invasive diagnostic tool, combined with sophisticated algorithms, provides a reliable and

highly promising alternative to current diagnostic protocols. Further research and validation in larger clinical settings are necessary to refine the models and ensure their broader applicability.

419.108 Environmental Influences on Language Development in Autistic Children: Socioeconomic Status, Shared Book Reading, and Screen Time

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Background: Studies have shown that distal environmental factors, like socioeconomic status (SES), and household activities within the proximal environment, like shared book reading and screen time, influence language development in neurotypical children. More specifically, annual household income, parent education level, and shared book reading frequency have been positively linked to language skills (Dickinson et al., 2012; Letourneau et al., 2013), while screen time has been negatively linked to language skills, in neurotypical children (Madigan et al., 2020). However, little research has focused on understanding how the environment shapes language development in children with autism.

Objectives: This study aimed to 1) explore the associations between SES, shared book reading frequency, screen time, and expressive and receptive language skills in autistic children; and 2) determine if shared book reading frequency and screen time mediate the association between SES and children's language skills.

Methods: This study used data from the 2018-2022 United States National Survey of Children's Health, a nationwide parent-report survey that collects data on determinants of children's health and well-being. The sample included 1217 autistic children, 2 to 5 years old ($M=3.83$). Structural equation modeling (SEM), a statistical method that allows for the exploration of associations between observed variables and latent factors by combining principles of factor analysis with multiple regression analysis, was used to examine the associations between SES, shared book reading frequency, screen time, and language skills. SES was measured using parent education level and family poverty ratio (FPL). Shared book reading and screen time were measured using questions about weekly shared book reading frequency (days/week) and daily screen-based media use (hours/day). Expressive and receptive language skills were measured using questions about children's abilities to use single and multi-word phrases, ask questions, tell stories, understand and follow directions, and recognize sounds.

Results: The final structural model (Figure 1) included three latent factors – SES, expressive language (EL), and receptive language (RL). Shared book reading frequency and screen time were included as observed variables, and child age and sex were included as observed covariates. Higher SES was significantly associated with more frequent shared book reading, less screen time, and higher expressive and receptive language skills. More frequent shared book reading was significantly associated with higher expressive and receptive language skills, while screen time was not significantly associated with either language factor. Shared book reading partially mediated the association between SES and both expressive ($\beta=.050$, $p<.001$) and receptive ($\beta=.044$, $p<.001$) language skills. The final structural model fit well ($X^2(111)=362.114$, $p<.001$; CFI=.966; TLI=.954; RMSEA=.043; SRMR=.032) and explained 24.3% and 27.1% of the variance in expressive and receptive language skills, respectively.

Conclusions: Findings suggest that the environment plays an important role in language development for children with autism. Autistic children from higher SES households experienced more frequent shared book reading, which was associated with stronger language skills. Contrary to what has been found in neurotypical children, screen time was not associated with autistic children's language skills. Findings offer implications for clinical practice, as encouraging shared book reading may support autistic children's language development.



419.110 Exploring Language Dynamics in Hispanic American Autistic Bilinguals Using Naturalistic Language Sampling

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Background: Research on bilingualism in autism is limited, especially in the U.S., likely due to clinical advice for families to use one language with their child. Existing studies have focused on parental decisions regarding language use, effects of bilingualism on cognitive functioning, and language proficiency relative to monolinguals using standardized testing. Bilingualism does not seem to have a cost on language in autistic individuals. However, it has not been looked at in more ecological contexts, using naturalistic language sampling (NLS), which would enable observation of real-world bilingual dynamics.

Objectives: We seek to analyze spoken language in autistic individuals who are English-Spanish bilinguals using NLS by (a) comparing participants' English and Spanish language proficiency and (b) measuring participants' use of code-switching.

Methods: Sixteen 2- to 31-year-old Hispanic American English-Spanish autistic bilinguals were recruited as part of a larger study on autism symptoms manifestation across languages. Naturalistic language samples were gathered from video-recordings of the Brief Observation of Autism Symptoms (BOSA), a 12- to 14-minute semi-structured interaction based on play and/or conversation. Each participant completed two BOSAs, one in each language. The language context (English vs. Spanish) of the BOSA was established by the examiner. Each BOSA was transcribed using SALT conventions for English and Spanish. Utterances were further coded as (a) 'target language' (matching the context), (b) 'inter-sentential code-switching' (using the non-contextual language), or (c) 'intra-sentential code-switching' (mixing both languages). Data on language proficiency and code-switching behaviors were extracted using SALT software. Language proficiency was measured in English and Spanish separately as total number of utterances (nUtt), mean length of utterance in morphemes (MLUm) and number of different words (NDW). Code-switching behaviors were measured using rates of utterance for each coded category in each language context.

Results: English proficiency appeared stronger than Spanish (see Fig. 1). Linear regression models, controlling for age, confirmed significant between-language differences in nUtt ($\beta = -54.06$, $SE = 22.19$, $p = .02$) and NDW ($\beta = -57.94$, $SE = 24.8$, $p = .03$), but not in MLUm ($p = .05$). Pearson correlations revealed strong positive associations between English and Spanish proficiency (nUtt: $r = .82$, $p < .001$; MLUm: $r = .88$, $p < .001$; NDW: $r = .89$, $p < .001$). Pairwise comparisons on a linear regression model with the Code-switching behavior x Language context interaction as fixed effect, controlling for age, showed higher rates of target language utterances in English vs. Spanish contexts ($\beta = .26$, $SE = .06$, $p < .001$), and more inter-sentential code-switching in Spanish vs. English contexts ($\beta = -.19$, $SE = .06$, $p < .01$). No between-context difference was found in intra-sentential code-switching ($p = .6$).

Conclusions: Overall, participants were proficient in both languages, but English appeared stronger than Spanish. Code-switching occurred more frequently when participants used their weaker and culturally non-dominant language (Spanish). Our findings highlight the need for education and service providers who are proficient in both languages to support autistic bilinguals in Hispanic communities in the U.S.



419.111 Exploring the Cerebellar Sensitive Period Hypothesis of Autism Using Language and Motor Tasks in Children

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Background: The Cerebellar Sensitive-Period Hypothesis posits that a perinatal cerebellar disruption is an underlying factor in the developmental manifestation of autism (Wang et al., 2014). Beyond motor skills (e.g., coordination and balance), the cerebellum also shapes non-motor functions relating to cognition, affect, language, and social interaction skills (Adamaszek & Kirkby, 2015; Koziol, Barker, & Jansons, 2015), areas that commonly differ in autistic individuals. However, research on cerebellar deficits has primarily focused on adults, and child research is necessary to test this developmental hypothesis.

Objectives: To bridge this gap, we conducted a series of studies comparing the performance of autistic and non-autistic children, ages 3 – 12, on various language and motor tasks known to involve the cerebellum.

Methods: Across studies, three areas of language (morphosyntax, semantics, and pragmatics), and six areas of motor skill (bimanual coordination, walking gait, balance, manual dexterity, aiming/catching, and speech motor coordination) were analyzed using spontaneous language sampling, standardized motor assessment, and kinematic measures extracted from traditional motion capture systems (Optotrak) and innovative machine-learning (DeepLabCut) and video analysis (OpenPose) tools. For the autistic children to be included, autism status was based on two criteria, 1) formal autism diagnosis according to parent report, and 2) scoring within the autism range on the Autism Diagnostic Observation Schedule-2nd edition and/or the Social Responsiveness Scale-2nd edition upon starting the study. For the non-autistic children to be included, they must 1) have no reported history of autism, and 2) score within the minimal-to-no symptoms range on the Childhood Autism Rating Scale-2nd edition and/or the Social Responsiveness Scale-2nd edition at the time of participation in the study. To be included in the studies with language tasks, all children were required to: 1) be native English speakers, 2) pass a hearing screening and oral mechanism examination, and 3) use oral speech as their primary means of communication (rather than augmentative or alternative forms of communication). Sample sizes varied from 24 to 44 across studies, depending on the recruitment period (e.g., currently ongoing, closed during COVID-19 lockdowns). For language-based studies, autistic and non-autistic children did not significantly differ on age, receptive vocabulary, expressive vocabulary, or nonverbal intelligence.

Results: Most findings supported the Cerebellar Sensitive-Period Hypothesis in both the language and motor domains. Specifically, performance differences in tasks assessing semantics, pragmatics, speech motor coordination, manual dexterity, and balance aligned with the predictions put forth in the Cerebellar Sensitive-Period Hypothesis in children. The use of early developing morphosyntactic measures, rather than grammatically complex measures, may have contributed to the lack of differences between groups on these language tasks. Ongoing analyses are underway.

Results to date are summarized in Table 1.

Conclusions: These studies add to a growing body of evidence that the cerebellum plays an integral role in the presentation of autism in children across a range of language and motor tasks. Speech-language pathologists, psychologists, occupational therapists, and physical therapists should consider co-treating or providing services collaboratively to maximize therapeutic benefits and to better understand the role of the cerebellum across their autistic clients' day-to-day tasks.

**419.112 Exploring the Effects of Peer and Teacher Interactions on Vocalizations in Preschool Children with Autism**

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Background: Understanding the factors that influence social communication in preschool-aged children with autism spectrum disorder (ASD) and developmental disabilities (DD) is essential for developing effective interventions. Prior research has shown that children's vocalizations can vary significantly depending on their communication partner, whether peers or teachers. The nature of these interactions is particularly important, as peers and teachers may foster different communication skills.

Objectives: This study investigates how different partner interactions and the severity of social communication difficulties, as measured by the Social Responsiveness Scale (SRS), predict the frequency of vocalizations among young children with ASD and DD. We examine associations of social responsiveness, partner vocalization input, partner type (peer vs. teacher), with children's vocalizations to peers and teachers.

Methods: The study involved 27 preschool children aged 3 to 5 years from three classrooms, including 11 identified with a primary IEP eligibility category of Autism Spectrum Disorder (ASD), 11 with developmental delay (DD), and 5 children not having an IEP (i.e., typically developing). Vocalizations were measured using Language ENvironment Analysis (LENA) audio recorders. UbiSense system was used to track children's location to assess children's rates of social contact (based on proximity and mutual orientation) with peers in the classroom. Teachers completed the Social Responsiveness Scale-2 (SRS-2) for each child to assess social communication difficulties. Higher SRS scores indicate greater difficulties in social communication, while lower scores reflect more typical social communication abilities. A linear mixed-effects model examined the influence of partner vocalization input, partner type (peer or teacher), and SRS scores on children's vocalizations to peers and teachers while in social contact with those partners, as well as the 2-way interactions between these variables, with vocalization data (level 1) nested within children (level 2).

Results: There was no main effect of SRS scores, $p=.207$, suggesting similar overall levels of child vocalizations regardless of social communication difficulties when accounting for partner input. Partner input had a significant effect on children's vocalizations, $p<.0001$, such that children who heard more vocalizations from peers and teachers produced more vocalizations themselves. However, there was also a significant interaction between partner input and partner type, $p<.0001$, such that input from peers had a stronger effect on children's own vocalizations than input from teachers (see **Figure 1** and **Table 1**). Finally, there was an interaction between SRS scores and partner input, $p<.0001$, such that partner input was more strongly associated with children's vocalization among children with lower SRS scores.

Conclusions: Together the results reveal that partner vocalization input is significantly associated with children's vocalizations, but that this effect is stronger for children with lower SRS scores, indexing fewer social communication difficulties. Additionally, in general children produced more vocalizations while in social contact with peers than teachers. These results suggest one potentially promising direction for early interventions could be to support peer interactions to enhance communicative behaviors in young children with ASD and other developmental disabilities.



419.113 Language Comprehension and Speech Production in Preschool Children with Autism Spectrum Disorder

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Background:

Children with autism spectrum disorder (ASD) demonstrate remarkable individual differences in their early developmental processes. This variability is obvious when examining their language comprehension and speech production skills. Research shows that many children with ASD exhibit linguistic impairments, however some may not experience any linguistic challenges. Studies on language development in preschool children with ASD are sparse and have raised questions about the stability of language profiles over time (Broome, 2023; Weismer & Kover, 2017). The present study reports on a longitudinal follow-up of language comprehension and speech production by Hebrew-speaking preschool children with ASD.

Objectives:

1. To examine the variability and consistency of the linguistic profiles in preschool children with ASD over a period of one year.
2. To explore the relationship between language comprehension and speech production among our participants.

Methods:

32 children aged 3–5 years old who were diagnosed with ASD participated in the study (Lord, 2008). The design employed three repeated measurements that took place every four months, in the participants' homes. The following diagnostic tools were administered: the Preschool Language Scale (PLS-4) (Zimmerman, Steiner, & Pond, 2002), the Autism Intervention Goals Questionnaire (Dromi & Diab, 2019), the Mullen Scales of Early Learning (Mullen, 1995), the Repetitive Behavior Scale-Revised (RRB-I) (Bodfish et al., 2000). These means provided an overall picture of each participant linguistic profile at each assessment point.

Results:

An examination of the overall linguistic profile of all participants at the beginning of study revealed four distinct groups: a. children with mild language delays; b. children with moderate language delays; c. children with significant language delays; and d. children with no language delays. Repeated measures revealed that approximately half (56%) of the children (17 participants) exhibited a consistent linguistics profile throughout the study. In contrast, about one-third (34%) (12 participant) showed with time a larger gap between their chronological age and language age. Only three participants (9.3%) decreased this gap between the first and third assessments. The results of the first assessment were a strong predictor of the profile obtained in the third assessment.

Conclusions:

The results of the present study indicated that:

- 1) Preschool children with ASD indeed show individual variability with respect to their early linguistic skills.
- 2) Over the course of one year notable consistency was found in the linguistic profiles, particularly in those participants with significant language delays at the beginning of the study
- 3) The early assessment and early intervention in the areas of language comprehension and speech production is essential as it predicts later attainments in these areas.



419.114 The Development of Mental State Verb Use Among Children with Autism

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Background:

Mental State Verbs (MSVs) are a way to describe people's internal states and processes. MSVs include verbs from different semantic categories: cognitive verbs (e.g., know), emotion verbs (e.g., afraid), perception verbs (e.g., see), physiological verbs (e.g., tired) and desires verbs (e.g., want). In young, typically developing (TD) children, research showed that the use of desires, perception and physiological verbs precedes the use of cognitive and emotion verbs. When examining the use of MSV in children with autistic spectrum disorder (ASD), the results of school-age children are contradictory, and little is known about the developmental trajectories of these verbs in preschool children with ASD.

Objectives:

The current study aimed to examine the developmental gap in children with ASD by exploring MSV use in these children as compared to TD children throughout childhood. In addition, the study investigated the effect of task (parental questionnaires versus narrative task) as representing the use of MSVs and the influence of age, group (TD versus ASD), syntax and Theory of Mind (TOM) abilities on MSV development.

Methods:

A total of 118 children ages 3–10 years participated in the study (59 ASD and 59 TD children). Parents of the children filled out a questionnaire of MSV from different semantic categories used by their child. In addition, all children participated in a narrative task that was designed to elicit MSV use. Furthermore, two variables that influence MSV were examined: sentence repetition for estimating syntax abilities and a battery of three tasks: different desires and first and second false belief tasks for measuring TOM abilities.

Results:

According to the parental questionnaire, cognitive and emotion verbs have a more protracted developmental trajectory in both ASD (Figure 2) and TD (Figure 1) children than other MSV categories (desire, perception and physiologic verbs), and they are more challenging for children with ASD in comparison to TD children. No differences were found between the groups in other MSV categories. In addition, a weak-to-moderate correlation ($r = 0.35$, $p < .001$) was found between MSV use in the parental questionnaire and the use of MSVs in the narrative task, but no difference was found between groups in the narrative task. Regarding variables related to MSV use, the model explained 57% of the variance of the average score of cognitive and emotion verbs, while age explained 30%, syntax 21.7%, TOM 4.1% and group 2%.

Conclusions:

The findings of this study indicate a specific and significant linguistic difference between ASD and TD children in the development of cognitive and emotion verbs. This gap was evident in the MSV parental questionnaire but not in the narrative task, possibly due to the small number of verbs used by both groups in this task. The study also highlights the role of syntax, TOM, and autism as related to the development of these verbs, supporting the notion of complex developmental conditions associated with MSV development and thus, the need to evaluate them in children with ASD.



419.115 Giving Time to Process: Caregiver Wait-Time during Naturalistic Interaction for Autistic and Non-Autistic Preschoolers
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Background: The adjusting, or “tuning”, of language has been observed in caregivers when communicating with children. Many measures of “tuning” have focused on the caregiver’s verbal utterances; however, little research has investigated the amount of time parents wait after asking a question. Sufficient wait-time, particularly for open-ended questions requiring more than a yes/no response, can be an important tool for supporting information processing (Wasik & Hindman, 2018). Especially for autistic children who may have slower language processing speed relative to non-autistic children (Williams, 2012; Hartley et al, 2020).

Objectives:

- Calculate caregiver wait-time for autistic and non-autistic children during naturalistic caregiver-child play.
- Determine whether wait-time differs across groups and question-types (open and closed).

Methods: Two groups of children (autistic and non-autistic) aged 24-71.9 months completed a Zoom-recorded 15-minute, naturalistic play-based interaction with their caregiver. Data collection is complete, with a final sample of 30 children per group. Here, we report preliminary analyses of 6 child-caregiver dyads including 3 autistic and 3 non-autistic children (mean child age: 52.73, 29.18 months respectively). Expressive vocabulary size on the MacArthur Bates Communicative Development Inventory 3 (Fenson et al., 2000) in this subsample did not differ significantly across groups ($t(4) = 0.21, p = 0.83$).

Using transcriptions of these interactions, timestamps were placed at the offset of caregiver-questions directed at the child, and at the onset of the caregiver’s next utterance (if coded as the next-turn; $kappa = 0.803, 3$ raters). This elapsed time between offset and onset thus yielded “caregiver wait-time”. Since wait-time can vary based on question-type, we also coded questions as open (“wh-” and “how”) or closed (yes/no, choices, confirmations); $kappa = 0.93, 2$ raters.

Results: From our sample ($n = 6$), caregivers of autistic children directed 103 questions at the child — 79.61% (82) closed, 20.39% (21) open — and for non-autistic children, 142 questions — 76.06% (108) closed, 23.94% (34) open. Using a significance level of 0.05 and a two-tailed, Welch’s t -test, wait-time for closed questions was not found to be significant between groups ($t(188) = 1.27, p = 0.34$), while wait-time for open questions was ($t(53) = 1.93, p = 0.049$). Here, caregivers of autistic children were shown to wait *less* for a child-response compared to the non-autistic group; *Figure 1*. Additionally, we found no differences between open and closed questions in either group; (ASD: $t(4) = 1.21, p = 0.30$; NonASD: $t(4) = 0.55, p = 0.63$).

Conclusions: We explored whether caregiver wait-time differed between groups and question types. While we saw no differences in wait-time for closed questions between groups, groups *did* differ in open questions; contrary to predictions, caregivers in the autistic group waited *less* than those in the non-autistic group. Also, within each group, caregivers did not exhibit a significant difference in wait-time between question-type, despite the fact that the former inherently calls for a longer response. Analyses will continue in the coming months to see if these patterns persist.



419.116 Parental Verbal Responsiveness to Autistic Children: A Closer Look

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Background: Parental verbal responsiveness (PVR) is a verbal manifestation of intersubjectivity, demonstrating responsiveness, reciprocity, affective sensitivity, and close attention to another. It responds to a child’s focus or communicative act (McDuffie & Yoder, 2010), is valuable in engaging children with their parents, and promotes language development (Haebig et al., 2013). It benefits autistic children who struggle shifting attention or responding to others’ initiations (Tomasello & Todd, 1983). It is unclear when PVR is most likely delivered within interactions, therefore, this work sought to identify this point using the narrative framework (Bruner, 1990). It proposes that over four phases, interactions with narrative structure demonstrate concordant intersubjectivity (Minnis et al., 2006). They begin with an introduction; develop reciprocal cycles of expression and interest; reach a peak of shared excitement at climax; and conclude as interactors return to quiescence to separate or re-engage (Trevarthen & Delafield-Butt, 2013). We hypothesise that if PVR delivery aligns with the energy contour and connectedness of each narrative phase, the amount of PVR should increase towards climax and fall away at conclusion.

Objectives: Identify whether the proportion of PVR, as compared to non-responsive parental input, differs by narrative phase.

Methods: Data was collected from 5 parent-autistic child (1F) pairs during 10-minute free-play sessions. The children (2;10-5;2) had limited spoken language confirmed through CDI parental reports, and diagnosis was confirmed using ADOS. Two video cameras recorded videos later coded for PVR and narrative using ELAN (Sloetjes & Wittenburg, 2008). Agreement >80% was reached between coders.

Results: Across all narrative phases, more PVR is provided than non-responsive speech. In the introduction, 80% of parental speech is responsive; 98% of speech is responsive in the development; 100% is responsive at the climax; and 75% is responsive in the conclusion (Figure 1). None of the differences between the proportions of PVR vs. non-responsive speech in the phases are significant, though some are approaching significance: introduction vs. development ($p=0.08$), development vs. climax ($p=0.07$), climax vs. conclusion ($p=0.08$), introduction vs. climax ($p=0.06$) (Table 1).

[FIGURE 1]

[TABLE 1]

Conclusions: The fact that the differences in PVR vs. non-responsive speech between phases begin to reach significance sometimes may suggest that parents of the autistic children follow a clear pattern of PVR and interest alignment. This may be unexpected because there is debate around whether autistic children are able to co-create narrative with their parents at all. Perhaps, then, using language to guide its structure, parents of autistic children are leading the co-creation of narrative and allowing their children to participate in these close engagements. That is, with the help of a supportive other who is attuned to their interests and who verbalises their thoughts and reflections on their actions, autistic children may be able to co-create rich narratives and reap their benefits. The limitations of a small sample size are recognised, and it is possible that with a larger sample, some of the results approaching significance could have reached the threshold. Future work should therefore examine this same phenomenon in a larger group.



419.117 The Acquisition of Relative Clause Sentences Contributes to Theory of Mind Abilities in Mandarin-Speaking Children with and without ASD

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Background: This study attempts to clarify the relationship between the acquisition of Relative Clause Sentences (RCS) with varying levels of embedding and Theory of Mind (ToM) abilities in Mandarin-speaking children with and without autism spectrum disorder (ASD). In typically developing (TD) children, only double-event RCS (e.g. *The girl kicked the man that jumped over the wall*) significantly predicted ToM abilities, whereas single-event RCS (e.g. *The girl kicked the man who is wearing a hat*) failed, indicating that the meta-representation in double-event RCS is the crucial ingredient to ToM development (Smith et al., 2003). Whether this also applies to children with ASD remains unclear. While a link between RCS embedding and ToM has been suggested in children with ASD (Durrleman et al., 2018), prior research has not distinguished between the contributions of single- and double-event RCS in autism.

Objectives: We evaluated the link between single-event RCS, double-event RCS and ToM skills in Mandarin-speaking children with and without ASD, to determine the extent to which RCS acquisition supports child ToM development.

Methods: Our participants included 35 4-12-year-old Mandarin-speaking children with ASD and 35 3-6-year-old TD children, matched on scores of the Chinese Peabody Picture Vocabulary Test and the Combined Raven's Test (Table 1). We administered a computer-based Truth Value Judgment task to assess children's knowledge of two RCS (i.e., single-event RCS and double-event RCS); the low-verbal ToM scale (Burnel et al., 2018) was adopted to evaluate children's ToM abilities.

Results: The two groups did not differ in their ToM (TD: 11.11 ± 3.79 , ASD: 10.00 ± 4.26 , $p > .05$) and single-event RCS scores (TD: 5.54 ± 0.85 , ASD: 5.06 ± 1.35 , $p > .05$). However, the ASD group exhibited a significantly lower score of the double event RCS than that of the TD group (TD: 5.29 ± 1.15 , ASD: 4.63 ± 1.37 , $t = -2.168$, $p = .034$). Correlation analyses revealed significant associations between ToM performance and RCS scores in both TD (single-event RCS: $r = .56$, $p = .001$; double-event RCS: $r = .52$, $p = .001$) and ASD group (single-event RCS: $r = .48$, $p = .004$; double-event RCS: $r = .53$, $p = .001$). However, stepwise regression analyses indicated that although single-event RCS is a significant predictor of ToM in TD children [$F(1, 33) = 16.11$, $p = .000$], only double-event RCS significantly predicted ToM abilities in autistic children [$F(1, 33) = 8.95$, $p = .005$] (Figure 1).

Conclusions: The findings suggest that single-event RCS significantly predicts ToM abilities in Mandarin-speaking TD children while double-event RCS plays a more prominent role in children with ASD, highlighting differences in the linguistic basis of mentalizing between ASD and TD children. Given the role of meta-representation in processing double-event RCS and its importance for ToM development in autism, targeting this syntactic structure could enhance ToM and social cognition in autistic children.

**419.118** Word Repetition Priming Defines Subpopulations of Autistic Children: Digital Pitch Shifting Can Restore Priming Effects Lost to Speaker Pitch Differences

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Background:

Some autistic children have difficulty suppressing irrelevant sensory detail, compromising perceptual object formation. In real-time speech processing this may lead to delays in interactive communication or, more severely, difficulty establishing rudiments of a language faculty, with downstream language impairment. Given autistic heterogeneity, this is likely not ubiquitous, but confined to a sub-population. If such a subpopulation could be identified, it would conceptually lead to optimized support/treatment management. One example of the need for suppressing meaning-irrelevant details is processing of speech from speakers with different acoustic parameters, e.g. pitch.

Objectives:

To determine the impact of speaker differences on repetition priming, we developed a paradigm of modified repetition priming (RepPrim) in which listeners heard pairs of similar or different words as well as pairs of similar words spoken by speakers with different pitch (male vs. female). A further objective was to explore a pathway towards future intervention, by remediating the potential impact of male vs. female speaker differences with digital pitch shifting, raising the male utterance 7 semitones and lowering the female 5 semitones - approximately pitch equivalence.

Methods:

The priming experiment examines the reaction time (RT) to the second word, which may be modulated by context (priming). We conducted this paradigm in 27 autistic children, 8-12yrs, using at least 25 exemplar pairs of (i) different words, (ii) repeated words, (iii) repeated words with different speakers and (iv) different words with different speakers, subject to pitch-shifting to match pitches, interleaved with other foil stimulus tokens. All words were simple English monosyllabic language words (e.g. *cry*, *dirt*, *doll*), with average word frequency of 3.095. Foils included plausible, pronounceable non-words, as RT was measured in a lexical decision (word vs. non-word) task on the second element of each pair. RT's were evaluated using a linear mixed model with condition as a fixed effect, age as a covariate and subject as a random effect.

Results:

24 autistic children tolerated sufficient stimuli to obtain evaluable RT responses to each condition. In 2/24 participants there was no evidence for canonical repetition priming (no RT facilitation for repeated words vs. different words); data from these were excluded. In the remaining 22/24, all exhibited canonical RepPrim - unprimed RT: 1.83 ± 0.09 s; RepPrim: 1.61 ± 0.08 s, $p < 0.001$. With word pairs primed by a speaker of different pitch, RT responses identified two subtypes: (A) partial RT facilitation ($n=16$: unprimed RT: 1.84 ± 0.11 s; different pitch RepPrim: 1.56 ± 0.09 s, $p < 0.001$ vs unprimed) and (B) absent facilitation or even "distracted" RT delay ($n=6$: unprimed RT: 1.80 ± 0.18 s; different pitch RepPrim: 1.88 ± 0.18 s vs same speaker, 1.66 ± 0.18 s, $p < 0.01$). In class B only, digital pitch manipulation led to normalization of RT: 1.64 ± 0.15 s, $p < 0.01$.

Conclusions:

The modified repetition priming paradigm was able to identify a subpopulation of autistic children with disturbed priming responses in the face of acoustic difference (pitch). This population does exhibit dramatic restoration of RT priming effects upon pitch shifting of auditory input, perhaps paving the way for a new class of support/intervention potentially realizable in a hearing aid form factor.

**Poster Session****420 - Early Development (< 48 months) II**

May 2nd, 2025, 12:30 PM - 1:30 PM - Hall 4A

420.119 Early Literacy, a Tool to Foster Relational Health and Positive Shared Interactions between Children with Neurodevelopmental Disabilities and Their Caregivers

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Background:

Early relational health is the connection young children and caregivers experience, beginning at birth, which is essential for children's growth and development, along with family wellbeing. Positive, shared interactions between caregiver and child, such as reading, nurture foundational relationships and can have a lasting impact on the health and wellbeing of children and their families. These shared interactions, however, can be challenging for families with a child diagnosed with a neurodevelopmental disability.

Objectives:

Our clinic partnered with Reach Out and Read (ROR) Texas to promote positive, shared interactions between children with neurodevelopmental disabilities and their caregivers. Our goal was to educate on the importance of early relational health with the caregivers in our clinic, an approach not formally undertaken. We also strived to implement the ROR program in our neurodevelopmental clinic, passing out books given to our patients along with caregiver reading guides tailored to the child's specific neurodevelopmental condition in either English or Spanish. All this with the ultimate goal to further support reading as an early relational health activity.

Methods:

Each clinician completed training on both the importance of early relational health and reading promotion for children with developmental disabilities. Early relational health was discussed and a statement was incorporated into clinic visit notes. Children ages 6 months to 5 years, randomly chosen as their clinic visit occurred during the intervention timeframe, were provided a book, along with caregiver guides on reading to a child with a specific developmental disability. Early Relational Health statements and book distribution numbers were tracked over the course of 6 months from our baseline of 0. Additional supports, such as electronic medical record smart phrases, reading posters in provider pods, easy access to books for the clinicians, and resident training were implemented to encourage early relational health promotion and book distribution.

Results:

Over the course of 6 months, the three medical providers in our clinic were able to increase the number of patients exposed to early relational health and educated on its importance. Providers more than doubled the number of patients exposed to early relational health education, increasing from 16 out of 60 patients to 40 out of 60 patients. Once additional clinic supports were implemented, the number of books and caregiver developmental disability guide distribution also increased. Book distribution and developmental disability guide distribution increased from 42% to 72%. One hundred sixty patients received early relational health education and two hundred and nineteen families of children with neurodevelopmental disabilities were provided with a book and caregiver developmental disability guides.

Conclusions:

In offering provider training and clinical supports via a quality improvement framework, we were able to implement a novel literacy and early relational health program by educating caregivers of children with developmental disabilities on the importance of early relational health. We were also able to increase the number of books given to patients with developmental disabilities in order to help support early relational health and early literacy exposure in the family's home environment from our baseline.

420.120 How Income, Parental Education, and Developmental Skills Shape Language in Latino Autistic Toddlers

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Background: Variability in language outcomes in autistic children is influenced by early cognitive, motor, and communicative skills (Mouga et al., 2019; Tager-Flusberg, 2018). Socioeconomic factors, such as family income and parent education, also play a significant role in language development in autistic children (Olson et al., 2021; Pecukonis et al., 2024), though this remains less explored. Understanding how these factors interact, especially in Latino populations with more disadvantaged backgrounds, could inform more effective, comprehensive, tailored intervention strategies.

Objectives: This study investigated environmental and developmental predictors of language in Latino autistic children. Specifically, the study (1) identified environmental factors that influence language outcomes and (2) explored how these factors interact with cognitive and motor skills. These analyses provided insights into the relative contribution of environmental and developmental factors in shaping early language abilities.

Methods: Data comes from an ongoing study of language development in autistic toddlers. Preliminary results for this abstract include data from 27 Latino autistic children (male = 18, female = 9, $M_{age} = 2.89$ years, $SD = .97$ years, Table 1). Participants underwent a comprehensive evaluation, which included the Mullen Early Learning Scales and ADOS-2. Caregivers completed a demographic questionnaire, the Vineland Adaptive Scales-3rd edition, the Toddlers Autism Semi Structure Interview (TASI), the Social Communication Questionnaire (SCQ), and the Modified Checklist for Autism in Toddlers (M-CHAT). All measures were provided in Spanish. Simultaneous multiple regression analysis was used to examine if cognitive and motor skills predict receptive and expressive language. Further moderation analysis included two socioeconomic factors, family income and parent education level, in the relationships. Results are presented in Table 2.

Results: These results demonstrated that fine motor skills and cognitive skills are significant predictors of both expressive and receptive language abilities, explaining 48% and 66% of the variance in expressive and receptive language abilities, respectively (Table 2). Family income and parent education were analyzed as moderators, revealing that parent education significantly moderated the relationship between fine motor skills and expressive language ($\beta = .379$, $t(23) = 2.756$, $p = .011$) as well as receptive language ($\beta = .315$, $t(23) = 2.532$, $p = .019$), suggesting that higher education levels enhance the impact of motor skills on language development. The interaction between cognitive skills and family income was marginally significant ($\beta = -.352$, $t(23) = -2.057$, $p = .051$). This suggests that the impact of cognitive skills on expressive language may vary based on family income levels, with lower family income weakening the positive relationship between cognitive skills and expressive language.

Conclusions: The results emphasize the importance of motor and cognitive skills in language development, particularly when considering the moderating effects of family income and parent education. This has implications for early interventions targeting motor skill development and the need to address educational disparities to enhance language outcomes in young children with autism. Also, interventions focusing on cognitive development may need to account for socioeconomic disparities to be more effective.

**420.121 Infant Neurobehavioral Development and Autism Emergence across the First Two Years of Life**

T. Djiko¹, E. Dixon², E. Platt² and J. Bradshaw², (1)The University of South Carolina, Columbia, SC, (2)University of South Carolina, Columbia, SC

Background: Healthy neurobehavioral functioning in early infancy may have cascading effects on the infant's ability to attend to their environment, form interactive patterns with caregivers, and has implications for long-term developmental outcomes. Researchers have found associations between early attention-related neurobehavior and later social communication skills (Bradshaw et al., 2020; 2022). However, a gap remains in our understanding of how neurobehavior in early infancy may predict the emergence of both restricted/repetitive and social communicative ASD symptoms.

Objectives: We aim to explore the predictive utility of neurobehavior during early infancy and later autism symptoms. Aim 1: explore group differences in 2-month neurobehavior between typically developing versus autistic children. Aim 2: examine associations between neurobehavior and ASD symptoms at 24-months.

Methods: Participants included 50 infants (n=23 female) at either low (typically developing sibling, n=32) or elevated (autistic sibling, n=18) familial likelihood for ASD as part of a larger longitudinal study. At 2-months, infant neurobehavior was assessed via the NeoNatal Neurobehavioral Scale (NNNS; Lester & Tronick, 2004). Specific NNNS summary scores examined in the present study included Attention, Handling, Self-Regulation, Arousal, Tone, Non-Optimal Reflexes, Quality of Movement, and Stress/Abstinence. At 24-months, the Autism Diagnostic Observation Schedule, 2nd Edition, Toddler-Module (ADOS-T; Lorde et al., 2012) was administered. The ADOS-T provides calibrated severity scores (CSS) for the Social Affect and Restricted/Repetitive Behaviors domains, with higher CSS scores indicative of increased symptom severity. At 24-months+, clinical best estimate (CBE) diagnoses were determined resulting in n=10 participants with ASD and n=26 typically developing children. CBE outcome was not available for 14 participants due to attrition.

Results: Aim 1: group differences by CBE diagnosis were found in the Stress/Abstinence summary score ($t(22.2)=-3.14, p=.004$) and Handling summary score ($t(32.0)=-3.35, p=.002$). Autistic children were found to display significantly fewer stress signs ($M=1.48$) compared to typically developing children ($M=1.89$). Autistic children were also found to require significantly less ($M=1.33$) handling/consoling by the examiner to maintain a calm state compared to typically developing children ($M=3.27$). Aim 2: Stress/Abstinence and Handling scores were utilized in subsequent analyses. Four separate simple linear regressions were performed to examine Stress/Abstinence or Handling as predictors for Social Affect CSS or Restricted/Repetitive CSS. Stress/Abstinence was found to significantly predict Social Affect CSS ($F(1,29)=6.20, p=.02$, adjusted $R^2=.15$) and Restricted/Repetitive CSS ($F(1,29)=9.51, p=.004$, adjusted $R^2=.22$). Handling was not found to significantly predict CSS scores. A separate linear regression model was performed with the addition of an interaction term between Stress/Abstinence score and CBE diagnosis. No significant main effects of Stress/Abstinence or CBE diagnosis were found, and the interaction term between these predictors did not significantly predict Social Affect or Restricted/Repetitive CSS scores.

Conclusions: Findings show that autistic children demonstrate reduced responsivity to environmental stress during early infancy. This may have downstream consequences on developmental outcomes, with infants who demonstrate lower registration of environmental stimuli displaying increased autism symptom severity at 24-months across both symptom domains. Our results add to the literature on early biomarkers, highlighting how measurement of infant responsivity to environmental stressors may help advance early screening.



420.122 Infant Temperament Differentially Predicts Internalizing and Externalizing Problems at Late School Age in Children with Elevated Likelihood of Autism

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Background: Infants' temperamental characteristics have been identified as predictors of later mental health problems in childhood and adolescence. Such findings, primarily characterized through samples without a family history of neurodevelopmental disorders (i.e., "neurotypical"), inform clinical practice through early monitoring and application of relevant clinical interventions. Autistic children have a higher likelihood of experiencing both internalizing (e.g., anxiety, depression) and externalizing (e.g., inattention, hyperactivity) problems. Previous longitudinal research identified infant temperamental characteristics that predict internalizing and externalizing challenges at age 5 in younger siblings of children with autism, who have an elevated likelihood (EL) of receiving an autism diagnosis. Yet, the question of whether infant temperament predicts mental health problems amongst EL siblings into late childhood and early adolescence remains unclear. Given the high rate of mental health problems autistic youth experience, characterizing early predictive factors may inform intervention.

Objectives: To explore the role of infant temperament in the development of mid-to-late- childhood internalizing and externalizing features amongst siblings with EL of autism.

Methods: Participants were siblings of autistic children who were themselves diagnosed (ASD; n=34; 25 boys) or not diagnosed (non-ASD; n=70; 33 boys) with autism at age three. Regression analyses (using PROCESS) were conducted to determine the moderating effect of group (ASD or non-ASD) on infant temperament collected at 12 months using the Infant Behavior Questionnaire (IBQ; subscales: Activity, Distress to Limits, Distress Latency, Orienting, Smiling, and Soothing) and internalizing and externalizing problems via the Child Behavior Checklist (CBCL) collected at age 8-12 years. We used bootstrapping (5000) and continuous variable centering.

Results: Groups did not differ on age at infancy ($M=12.31$ vs. 12.56 months) or follow-up ($M=113.05$ vs. 113.40), nor 12-month temperament measures (all p 's $>.05$). Significant group differences were found for internalizing ($p=.03$) and externalizing problems ($p=.003$) at 8-12 years.

Internalizing Problems: Group moderated the relation between Smiling and CBCL Internalizing Problems ($b=-6.61, SE=2.80, p=.02$). No moderation was seen on the significant relation with Distress Latency ($b=-4.20, SE=2.31, p=.07$) nor significant relations between remaining IBQ subscales and internalizing problems. **Externalizing Problems:** Diagnostic group moderated relation between IBQ subscales of Distress Latency ($b=-7.16, p=.01$); Activity ($b=-6.57, p=.01$), Distress to Limits ($b=-6.79, p=.01$), Orienting ($b=-6.33, p=.02$), Smiling ($b=-6.69, p=.01$), and Soothing ($b=-6.93, p=.01$) and CBCL Externalizing Problems.

Conclusions: Infant temperament significantly predicted later mental health problems in 8- to-12-year-old younger siblings of autistic children. This predictive relationship differed depending on whether the sibling was diagnosed with autism at age 3. Findings elucidate which temperament characteristics are most predictive of later externalizing problems amongst autistic children. Internalizing problems were less predictable from infant temperament characteristics for the autistic group; only Smiling differentiated them. In contrast, early Distress Latency significantly predicted internalizing problems for both autistic and non-autistic siblings; no other temperament subscales predicted internalizing problems.

420.123 Investigating the Effects of Prenatal Heavy Metal Exposure on Toddler Neurodevelopment in Suriname

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Background: The prevalence of neurodevelopmental disorders, including Autism Spectrum Disorder (ASD) and Attention Deficit Hyperactivity Disorder (ADHD), continues to rise, and etiology is likely a complex interplay of genetic and environmental factors arising in the preconception through perinatal period. Investigating the impact of various environmental factors on neurodevelopmental outcomes is an important step in guiding future research into gene-environment interactions. This study examines the potential impact of prenatal exposure to heavy metals, specifically Lead and Mercury, on neurodevelopmental outcomes in children in Suriname, a LMIC in South America. The diverse cohort consists of 708 mother-child pairs, with mothers varying in age, ethnicity, economic status, education level, and geographic region within Suriname. **Objectives:** This study aims to determine how prenatal exposure to heavy metals, such as Lead and Mercury, influences neurodevelopment in toddlers. The focus is on assessing behavioral outcomes and functional development, including motor skills, communication, and cognitive abilities.

Methods: Data were sourced from the Caribbean Consortium for Research in Environmental and Occupational Health (CCREOH), which collected biological and assessment data from mothers and children in Suriname. Blood samples from pregnant women were collected during the late first and early second trimesters to measure Lead and Mercury levels. Lead was measured in micrograms per deciliter (µg/dL), while Mercury was measured in micrograms per liter (µg/L).

When the children were 2-3 years old, clinicians assessed neurodevelopment using the Bayley Scales of Infant and Toddler Development-III (BSID-III), a validated tool for use in Suriname. The Child Behavior Checklist (CBCL) was also completed by the mothers to evaluate their children's behavioral outcomes. Heavy metal concentrations were log-transformed to evaluate their associations with neurodevelopmental outcomes. The relationship between heavy metal exposure and measures from BSID-III and CBCL was visualized using Locally Estimated Scatterplot Smoothing (LOESS). Correlations were evaluated using Spearman's Rho, and an ANOVA was conducted to analyze differences in heavy metal exposure across different regions of Suriname.

Results: For the BSID-III, prenatal Lead exposure was significantly correlated ($p < 0.001$) with lower scores in Expressive Communication, Receptive Communication, and Gross Motor domains, while Mercury exposure was significantly correlated ($p = 0.007$) with lower Expressive Communication scores. In the CBCL assessment, Lead exposure showed strong correlations ($p < 0.001$) with increased internalizing problems and lower total raw scores, while Mercury exposure was significantly correlated ($p < 0.001$) with increased internalizing problems. ANOVA results revealed that Lead and Mercury exposure levels were highest in Suriname's interior regions and lower in agricultural and urban areas.

Conclusions: The observed significant correlations between prenatal exposure to Lead and Mercury and decreased scores on the BSID-III and CBCL suggest that exposure to heavy metals is associated with adverse behavioral and neurodevelopmental outcomes in children. These findings serve as an essential first step in understanding the impact of heavy metals on neurodevelopment. Further, they highlight potential environmental sources of exposure, such as unregulated gold mining and pesticide use, underscoring the need for effective regulation and intervention to minimize exposure risks in affected regions.

420.124 Limitations in Using “Worry” As a Screening Tool for ASD in Part C Early Intervention

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Background:

Identifying Autism Spectrum Disorder (ASD) in Early Intervention (EI) can facilitate access to autism-tailored services (Eisenhower et al., 2021), which has been shown to greatly benefit autistic children (Dawson et al., 2010). Although screening for ASD in pediatrics can lead to access to EI services, autism diagnostic services are not always pursued. Autism screening in EI is often initiated following caregiver reports of worry; however, waiting until a caregiver reports worry to screen, might lead to under-identification, as autism characteristics can be endorsed but misattributed as commonly occurring aspects of children's development (Hallyburton, 2022). Effective screening methods are essential in identifying autistic children while they are eligible for autism-tailored services within EI.

Objectives:

For this submission, we compare rates caregiver reported a) worry and b) elevated social-emotional behavior (SEB) problems, and/or delays in SEB competencies in a sample of diagnosed autistic toddlers.

Methods:

Participants (N=109) were recruited through an ongoing implementation/effectiveness trial in Part-C early intervention programs. Eligible families had children between 16- to 32-months old with delays in social communication. For this study, the sample was further restricted to children who went on to receive an ASD diagnosis. Caregivers completed the 42-item Brief Infant-Toddler Social and Emotional Assessment (BITSEA), a nationally standardized screener for 12- to 36-month olds, reflecting on child behaviors over the previous month from 0 (Not True/Rarely) to 2 (Very True/Often). The autism problem (10 items) and autism competence (9 items) scales were employed. Caregiver reports of worry was evaluated using the BITSEA item: "How worried are you about your child's behavior, emotions and relationships?" rated on a four-point scale, and further dichotomized for analyses (0=Little to No Worry, 1=Worried to Very Worried).

Results:

The BITSEA autism scales identified 95.5% of autistic toddlers in this sample (104 of 109). The autism competence scale, using a cut-score of 11.5, identified 102 of the 109 autistic toddlers (93.5%). Two additional children were identified based on an elevated cut score (greater than 4.5) on the autism problem scale (1.8%). In contrast, 53 caregivers reported that they were "Worried" to "Very Worried" (45.3%) and 23 and 37 reported "No" (21.14%) or "A little worry" (33.9%) respectively. Reporting worry was related to the BITSEA autism problem and competence scores. None of the 5 caregivers reporting no autism concerns on the BITSEA reported being "Worried" to "Very Worried." Caregivers who reported both "Of Concern" autism problems and competencies reported greater worry (60%) than those with only a single "Of Concern" autism domain (40%); $\chi^2(1, N=104)=11.55, p=.001$.

Conclusions:

The majority of caregivers with toddlers who go on to be diagnosed with ASD— even in a sample selected from families who had accessed EI services and participated in a hybrid-effectiveness clinical trial— were not worried about their children's behaviors, emotions, or relationships. In contrast, almost all children were identified with caregiver ratings of specific autism-related competence, and to a lesser extent, problem behaviors. Although worry is predicted by behavior ratings, findings highlight the value of autism screening in EI irrespective of caregiver worry.

420.125 Longitudinal Trajectories of Parenting Stress in Caregivers of Children at Elevated Likelihood for Autism or ADHD

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Background: Prior research has established that caregivers of children with neurodevelopmental conditions experience higher levels of parenting stress compared to caregivers of typically developing children. However, less is known about similarities and differences between longitudinal trajectories of parenting stress among caregivers of children demonstrating emerging autism- or ADHD-related behaviors over the first years of life. Focusing on both autism and ADHD in concert is important because these conditions often co-occur and may share overlapping early phenotypes. The influence of emerging autism- and ADHD-related behaviors on parenting stress remains unclear, particularly during early childhood, when they first arise.

Objectives: This study aims to address these gaps by (1) examining trajectories of parenting stress among parents of infants, ages 12-36 months, who are at elevated likelihood for autism or ADHD, and (2) exploring how early autism- and ADHD-related behaviors influence parenting stress over time, thereby contributing to our understanding of the impact of neurodevelopmental conditions on caregiver well-being.

Methods: Data were drawn from a prospective longitudinal investigation of infants/toddlers at high and low familial likelihood for autism and ADHD. A total of 113 participants were classified into one of three outcome groups at 24 or 36 months of age: Autism ($n = 18$), ADHD Concerns ($n = 26$), or Comparison ($n = 69$). Participants were administered developmental evaluations at 12-, 18-, 24-, and 36-months of age. Primary measures were collected at each timepoint, including the Parenting Stress Index-Short Form, Behavior Rating Inventory for Children (BRIC; measure of ADHD-related behaviors), and examiner-rated social engagement (measure of autism-related behaviors). Trajectories of parenting stress were analyzed using generalized estimating equations (GEE). Associations were examined using correlational analyses, while predictors of parenting stress were assessed through multiple linear regression.

Results: The GEE model revealed a significant main effect of outcome group ($\chi^2 = 13.03, p < 0.001$) such that parenting stress was elevated overall in the autism group when compared to other groups, but there was no main effect of visit and no outcome group by time interaction ($p = 0.77$).

Both examiner-rated social engagement and ADHD-related behaviors were associated with heightened parenting stress. After accounting for baseline stress levels, lower examiner-rated social engagement at 18 months of age emerged as a predictor of higher parenting stress at 24 months ($p = 0.003$).

Conclusions: Parenting stress was significantly higher in the Autism group overall. In addition, trajectories of parenting stress were relatively stable across the three groups, suggesting that parents of children with autism experience consistently elevated levels of parenting stress. These findings highlight the importance of providing comprehensive support and resources to caregivers of children displaying autism-related behaviors as they navigate the unique demands associated with their caregiving roles. ADHD-related behaviors did not significantly predict parenting stress, suggesting that other factors may have a greater influence on stress levels among caregivers of children with ADHD Concerns.

420.126 Machine Learning Analysis of Key Screening Questionnaire Items for Early Detection of Autism Spectrum Disorder in Children Aged 18-48 Months

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Background: Despite the importance of early identification of autism spectrum disorder (ASD) and various questionnaires assessing ASD, there is limited analysis of how specific items during infancy differentiate ASD from typical development (TD).

Objectives: This study aimed to examine which screening items are important for distinguishing between ASD and TD in infancy, using machine learning methods.

Methods: The study included 645 children at the age of 18–48 months in South Korea (Table 1). The classification of TD and ASD used the Korean versions of the ADOS-2 and CARS-2. Autism screening questionnaires included the Korean-developed BeDevel-Q and the Korean versions of Q-CHAT, M-CHAT, SCQ, and SRS-2. A dataset was selected by age-appropriate items for multiple questionnaires (Table1). Then, the dataset for each age group was split using the stratified k-Fold method, with 20% set aside as a holdout test set.

Various classifiers were employed, including linear-based models (logistic regression), tree-based methods (LightGBM, XGBoost, CatBoost, Random Forest, Gradient Boosting Classifier, AdaBoost), Support Vector Machines, k-Nearest Neighbors and Multi-Layer Perceptron methods. Each model was trained separately for each age group to capture age-specific variations. The best-performing classifier was selected from these models based on performance metrics (accuracy, area under the receiver operating characteristic curve (AUC)). Recursive Feature Elimination with Cross-Validation was then applied to identify a minimal set of features necessary to achieve comparable performance to models trained with all items (DeLong's p-value > 0.05). One to three items per group were sufficient to maintain high accuracy and AUC. We then retrained the selected model using these key items and validated it on the same hold-out test set. The simplified model performed comparably to those trained with the full dataset.

Results: The findings showed key items, specifically highlighting those that distinguish ASD from TD children. Table 2 shows the sets of one to three key items identified by the ML models as most important for distinguishing ASD from TD children in each age group (18-23 month: Q-CHAT2. How easy is it for you to make eye contact with a child?; 24-30 month: Q-CHAT 2, BeDevel-Q 26; 31~42 month: SRS-2 13, SRS-2 44; 43~48 month: SRS-2 13, SRS-2 22, SRS-2 44). These items were selected based on feature importance analysis and demonstrate that even with a small subset of items, the models maintained high classification accuracy.

Early on (18-30 months), basic social responsiveness like eye contact and language are crucial. As children grow older, social domains such as social skills with peers and understanding (31-48 months) become more important in distinguishing TD from ASD. Notably, models trained with only one to three key items maintained high accuracy.

Conclusions: The present study, based on machine learning model analysis, demonstrated the potential for ASD screening using 2-3 items, with eye contact and language development-related items being effective for children under 30 months, and social interaction and play-related items for children aged 31-48 months. These findings are expected to play a role in understanding important variables for the screening of children with autism.

**420.127** Measurements of Joint Attention in Naturalistic Play

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Background: Joint attention skills (sharing attention with a social partner through prelinguistic gestures including showing, pointing and giving to share) have long been viewed as important to children's language development (Tomasello, M., 1988). These skills, and specifically initiating joint attention, are delayed in children with autism (Paparella, T., Goods, K. S., Freeman, S., & Kasari, C., 2011). Assessments like the Early Social-Communication Scales, or ESCS (Mundy et al., 2003), allow interventionists to measure joint attention skills. The ESCS provides a controlled environment (i.e., an assessment room free of distractions) with opportunities that are intricately set up by the assessor for children to demonstrate their joint attention and requesting skills. Importantly, researchers and clinicians may benefit from expanding their methods of joint attention assessment into naturalistic contexts, providing more opportunities for assessing joint attention skills that can also improve ecological validity. **Objectives:** The current study aims to explore the validity of measuring joint attention within unstructured play interactions with a teacher by comparing joint attention used in this context with joint attention skills demonstrated in the ESCS.

Methods: The same joint attention skills that are typically codified from videotaped ESCS assessments were instead coded from unstructured teacher-student interactions administered to 66 autistic preschoolers, ages 2 to 5 years. Of the total sample size ($n = 66$), 83% were boys and 11% were girls, with the majority of students being of either Hispanic or Caucasian backgrounds. These teacher-child play interactions (TCX) were ten-minute long videotaped sessions in which instructors engaged their students – either one-on-one or in a group setting – using a variety of developmentally appropriate toys. A naturalistic observation of how children and adults interact with one another through the use of toys, the TCX has no set guidelines on “how to play.”

Results: On average, children displayed 12.98 joint attention gestures ($SD = 9.06$) in the ESCS. During the TCX, children displayed an average of 6.53 joint attention gestures ($SD = 6.96$). Correlation analysis show moderate positive correlations between child initiated joint attention in unstructured play ($r(62) = .33, p = .007$) when compared to the ESCS. Comparison of correlation coefficient rates across measurement contexts provides evidence of convergent validity for measuring joint attention skills through unstructured play.

Conclusions: While the ESCS excels at measuring a child's joint attention initiations, the correlation analysis illustrated that an unstructured play environment can be a supplemental tool of representing skills, especially in community settings in which performing an ESCS are not easily feasible. Future studies are needed that can devise quick coding methods to be used in natural contexts, and probes for generalization of skills from familiar to unfamiliar partners.

420.128 Multimodal Clinical and Neurofunctional Social Subtyping Reveals Three Highly Validated Autism Subtypes

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Background: Autism spectrum disorder (ASD) is characteristically heterogeneous, particularly in the severity of social affective and communication symptoms. While the clinical manifestations of this symptom heterogeneity typically appear within the first 3 years of life, the neurobiological bases underlying this diversity is largely unknown. Many studies have tried to delineate behavioral subtypes of ASD to better understand the heterogeneity, but none have connected clinical phenotypes to underlying neurofunctional differences. Furthermore, previous attempts at subtyping included little to no validation of the clusters and varied in their inclusion of control populations, both of which bring cluster generalizability into question.

Objectives:

1. To delineate subtypes of ASD based on both social clinical abilities and social neural functioning at early ages, and specifically distinguish neural features associated with profound autism clinical phenotypes.
2. To map these autism subtypes to the broader toddler population, including typical development and other developmental delays, and determine the generalizability of our autism subtype classifications.
3. To rigorously validate our clustering with multiple statistical methods.

Methods: We used a patient subtyping method that is well-established in precision medicine research: Similarity Network Fusion (SNF). With this data-driven method, we integrated multi-modal data spanning social neurofunctional activation and social and language clinical abilities in 137 toddlers across multiple timepoints. Our sample included 81 ASD, 23 developmentally delayed and 33 typically developing (TD) toddlers, which allowed us to study subtypes both within ASD, and in the broader context of the general toddler population. We used 5 methods for validation: cluster separation, external validity, 5-fold cross validation, normalized mutual information robustness, and independent cohort replication with 42 additional subjects.

Results: We found three robust autism subtypes delineated by social neural and social clinical features (Figure 1). This mapping revealed a prominent subtype with early-age signatures of profound ASD, including low social and language abilities, negligible social neurofunctional activation, and maintenance of low or even declining abilities over time. On the other end, we see a high ability autism subtype, with near typical scores both neurofunctionally and clinically, and overall longitudinal clinical improvement. These diverging subtypes were largely maintained when generalized among non-ASD toddlers (Figure 2). In this clustering, all of the subjects previously in the profound autism-like cluster mapped to the same “low” cluster. Furthermore, an “optimal” autism subtype was revealed that clustered more closely with TD subjects than other ASD subjects. Both rounds of clustering were highly validated.

Conclusions: These results indicate that the spectrum of heterogeneity in ASD may be less continuous than previously thought, and that different subtypes of ASD have distinct neurofunctional features. Our connection of clinical phenotypes to neural functioning indicates subtype differences are deeply rooted in autism etiology and that treatments should be created with consideration of these differences, particularly for the subtype with profound autism profiles. Finally, this work offers an explanation for the high frequency of mixed results in the field: If distinct subtypes are unequally represented or being averaged together, findings are likely to be skewed or missed entirely.



420.129 Non-Social Visual Search Advantage in ASD Emerges in Toddlerhood: A Longitudinal Study of Neurodevelopmental Outcomes

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Background: Infants who are later diagnosed with ASD show heightened performance in standard, nonsocial Visual Search (VS) tasks (Cheung et al, 2016). Evidence also suggests that higher VS performance at 9-months is predictive of autism symptoms later in development (Gluga et al, 2011). To our knowledge, neither the developmental course nor the social-versus-nonsocial specificity of the pop-out effect have been well investigated.

Objectives: Explore differences in developmental trajectories of the pop-out effect, stratified by developmental outcomes.

Methods: 223 infants were recruited with elevated likelihood (autistic sibling, low birthweight) or typical likelihood for ASD, and seen at 7, 14, 28, and 39-months. Participants were sorted into three outcome groups, ASD (n=42), atypical with no ASD diagnosis (ATP, n=42), or neurotypical (NT, n=139).

Participants were eye-tracked using SR Eyelink 1000+ while viewing VS stimuli (48 trials each session) shown in three conditions: Seven x's and one pop-out target face (TargetFace_DistractorX); 7 identical faces with a target "X" (TargetX_DistractorFace); and 7 Xs with a target O (TargetO_DistractorX). Each trial was preceded by a 1500ms central fixation point.

Trial-level logistic linear mixed models predicted percent of trials that (1) the target was looked at at all (%LookedAt), or (2) looked at first among all objects (%FirstLook), from independent factorial effects of age (3rd-order natural spline), group, and condition.

Results: ANOVAs from the linear mixed model for %LookedAt showed at 7-months, ASD infants were less likely than ATP to look at targets in TargetFace_DistractorX and TargetO_DistractorX ($p=.024$, $p=.009$), but more likely in TargetX_DistractorFace ($p=.015$), but only showed a marginal elevation to look at targets than NT ($p=.096$) in the TargetX_DistractorFace condition. However at 28-months, the ASD group was more likely to look at the target than the NT and ATP groups in all conditions ($p < 0.05$). There was no significant difference in looking between ASD and other groups at 14 or 39-months for any condition.

For %FirstLook, at 7-months, ASD infants were less likely than both ATP and NT groups to look at targets in TargetO_DistractorX ($p=.003$, $p=.016$), with no other significant differences. At 28-months, the ASD group was more likely to look first at the target than the ATP and NT groups only for the TargetO_DistractorX condition ($p=.040$, $p=.018$). There was no significant difference in looking between ASD and other groups at 14 or 39-months for any condition.

Conclusions: Autistic infants diverge in their developmental trajectories of VS from ATP and NT groups at 7 and 28-months. 28-month findings replicate work suggesting stronger VS capabilities in autistic toddlers (Kaldy et al, 2011), and appear more vigorous for nonsocial stimuli. 7-month findings may signal broader vulnerabilities in early attentional development in ASD. However, a lack of generalizability to the 7-month NT group may also suggest heightened ATP orienting responses. The ATP group included a larger proportion of low-birthweight children, with older chronological if not gestationally-corrected age, potentially explaining their relative VS maturity. Ongoing work is examining interactions of birth and genetic factors; these results should be considered preliminary.

**420.130** Preliminary Characterization of Longitudinal EEG Trajectories in Infants with and without Genetic Risk for Autism

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Background: Recent studies emphasize the role of *de novo* mutations in autism spectrum disorder (ASD). In infancy, genetic risk factors for autism are linked to changes in brain functioning (Girault, 2022; Hazlett, 2017). A widely utilized measure of neural functioning is resting state EEG power, which has been proposed as a candidate biomarker for early risk identification for ASD, primarily in cross-sectional studies.

Objectives: Here, we examined longitudinal EEG trajectories between infants who are at identified genetic risk (IGR) for autism and infants not at genetic risk (Non-IGR) from 4 to 15 months of age. Genetic risk is defined as a genetic mutation that has been associated with increased risk for a later ASD diagnosis, as identified through the Genomic Uniform-screening Against Rare Diseases In All Newborns (GUARDIAN) study.

Methods: This analysis included 5 IGR infants ($n=13$ datasets; $n=3$ female) and 3 non-IGR infants ($n=8$ datasets; $n=2$ female), whose EEG data was collected at multiple timepoints between 4 and 15 months of age.

Infants were seated on their caregivers' lap and watched cartoon videos while resting state EEG was recorded for 5 minutes using a high density 128-channel array (MagStim EGI Inc).

The EEG data was preprocessed using the Harvard Automated Processing Pipeline for EEG (HAPPE). Whole-brain absolute EEG power was obtained by decomposing in 2-second segments and averaged across all channels. See Table 1 for frequency band definitions.

Statistical analyses were carried out in R. Regarding within-participant analysis, we used linear regression to model each infant's change in log-transformed EEG power across the entire scalp for each frequency band as a function of log-transformed age. These regression models were used to generate individual infant's linear developmental slope values in each frequency band for between-subject analysis. We used an independent-samples *t*-test to analyze differences in slope values between the IGR and Non-IGR infants.

Results: Across all participants and timepoints, datasets had an average 162.76 (SD = +/- 34.60) seconds of usable data. Independent-sample *t*-tests revealed no significant group differences in linear developmental slope values between IGR and non-IGR infants in any frequency bands. In the delta frequency band, we saw an emerging but non-significant difference ($p=0.094$) in slope. On average, IGR infants had more positive delta slopes (Average slope value= 0.30) compared to non-IGR infants (Average slope value = -0.12). Average slope values of all frequency bands in each group are displayed in Table 1.

Conclusions: This preliminary data suggests that differences in longitudinal EEG power may exist between infants with a quantified genetic risk for autism and those without, aligning with previous research that reported that steeper increases in delta band power was associated with increased risk for ASD in the first year of life (Gabard-Durnam, 2019). Data collection is on-going and an estimated (20 additional infants) will be included in the analysis. Future exploratory work will examine regional differences in EEG power trajectories with a focus on the frontal region, given reported differential frontal alpha and beta band power in infants at familial risk for autism (Gabard-Durnam, 2019).



420.131 Remote Assessment of Infant Memory: Encoding Face and Non-Face Stimuli in Infants with and without an Autistic Sibling
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Background:

The time between early cognitive milestones and the typical age of autism diagnosis leaves significant gaps in identifying early markers of autism. Additionally, most studies have been limited by reliance on in-person assessments, thus limiting accessibility and generalizability of findings. To address these gaps, we developed the Remote Infant Studies of Early Learning (RISE) Battery, which remotely assesses key cognitive domains (memory, social preference, prediction, multimodal processing, and language comprehension). Here we present data from the visual paired-comparison memory task. In it, infants are familiarized with a stimulus (faces or objects) and then presented with the familiar stimulus alongside a novel stimulus of the same class (Manns et al., 2000). Previous evidence suggests that infant siblings of autistic children show atypical habituation to faces (Bradshaw et al., 2011).

Objectives:

To test memory for faces and non-face complex stimuli (Fribbles, which preserve the complexity of facial features without being social) in the remote setting in infants with and without an autistic sibling. Hypothesis 1: Memory (defined as preference for the novel stimuli at test) will be stronger at 12 months than at 6 months and stronger for faces than Fribbles. Hypothesis 2: Memory for faces (but not Fribbles) will differ for infants with and without an autistic sibling.

Methods:

55 6-month-olds ($n=55$; 31 female, 23 male) and 56 12-month-olds ($n=56$; 23 female, 33 male) (52% White, 8% Asian, 2% Black, 38% more than one race; 15% Hispanic) without an autistic sibling have been tested to date. The current analysis (restricted to infants with >33% usable frames) included 36 6-month-olds and 37 12-month-olds (cross-sectional). Infants were familiarized with faces (Asian, Black, or White) or Fribbles (Figure 2) on 6 alternating trials. Familiarization lasted 25 seconds and was followed by two test trials with location of the familiar stimulus counterbalanced across trials. Looking preferences were coded using iCatcher+ (Erel, 2023). Analyses used a linear mixed-effects model. Data collection for infant siblings of autistic children (current $n = 36$) is underway and will be available by the conference.

Results:

Both 6- and 12-month-olds demonstrated reliable preference (mean proportion > 0.50) for novel faces (12-m: 0.56 [0.52 - 0.60], $p = 0.004$; 6-m: 0.56 [0.52 - 0.60], $p = 0.006$). There was not a significant age effect. For non-face objects (Fribbles) 6-month-olds (6-m: 0.54 [0.50 - 0.58], $p = 0.041$), but not 12-month-olds (12-m: 0.54 [0.50 - 0.58], $p = 0.084$) showed reliable preference for the novel object at test (Figure 1).

Conclusions:

These results suggest promise for remote assessment of developmental milestones including memory for faces and non-face objects. We found that both 6- and 12-month-old infants showed a preference for novel faces. Contrary to our predictions, preference for the novel Fribble was reliable at 6 months, but not 12 months. This unexpected finding may be associated with perceptual narrowing for faces. Results will be discussed in the context of potential differences in memory for faces and non-face objects among infant siblings of autistic children.



420.132 Resources to Support Community Based Early Intervention Providers Un Using Caregiver Centered Evidence Based Practices: Development Process and User Data**J. Amsbary**, UNC Chapel Hill, Chapel Hill, NC

Background: When providing EI services to toddlers with autism, family-centered practices focused on family capacity building and evidence-based practices (EBPs) are recommended in order to support all children and caregivers to reach optimal outcomes (Division for Early Childhood of the Council for Exceptional Children; DEC, 2014; Dunst, 2002; Trivette et al., 2010). And when EBPs are implemented early and effectively, long term outcomes related to social skills, cognition, and engagement for children with autism and their families/caregivers are improved (Boyd et al., 2010; 2018; Dawson & Bernier, 2013). However, it is unclear how many EI providers are providing services in this way and whether they have adequate resources to support the use of EBPs in a family centered approach. Thus, additional resources could be helpful for EI providers working with caregivers of children with autism to support engagement, understanding, and empowerment in the EI system.

Objectives: This poster will describe the development process of freely available online modules to support EI providers to use a caregiver coaching model as part of their service to empower caregivers to use evidence-based practices (EBPs) in daily routines and activities. We will describe focus group findings used to inform these modules' development and user data reflective of module perspectives and learning outcomes. There are 6 existing modules focused on Parent Implemented Intervention (PII) for services delivered in family homes; Naturalistic Intervention (NI) for services delivered in early care and education settings; and 4 additional modules on focused EBPs of (a) Reinforcement, (b) Prompting, (c) Visual Supports, and (e) Addressing Interfering Behavior. The module format (including planning, using, and monitoring of each practice) will be outlined and user data related to EBP knowledge and module usefulness will be presented.

Methods: Focus groups were conducted with caregivers and providers to inform the development of the online modules. Data were analyzed using thematic qualitative analysis. In addition, user data are regularly collected as part of the module design and these data were descriptively analyzed. User data describe users' perspectives relative to the quality, usefulness, relevance and learning outcomes of the modules.

Results: Focus group data analysis led to the development of specific components in the modules such as short audio clips from providers', caregivers', and teachers' perspectives and video illustrations to demonstrate when an EBP might be a good fit to address a goal/skill in addition to videos showing how to use each EBP. Examples of module resources will be included in the poster. In addition, user data indicate that the existing modules are useful and that EI providers are learning the practices. User data indicate that over 18,000 users have accessed the modules and rate them quite positively. Specifically, module quality was rated an average of 3.5/4; module relevance was 3.6/4; module usefulness was 3.5/4; and meeting learning outcomes was 3.5/4.

Conclusions: This poster will provide information related to strategies and resources for increasing uptake and use of EBPs as part of EI family-centered services, an important step to closing the research to practice gap.

420.133 Salience Network Connectivity Relates to Sleep Disruption in Infants at High Familial Likelihood for Autism**E. Chiem¹**, L. E. Wagner² and M. Dapretto³, (1)Psychiatry and Biobehavioral Sciences, UCLA, Los Angeles, CA, (2)University of California, Los Angeles, Los Angeles, CA, (3)Department of Psychiatry and Biobehavioral Sciences, University of California Los Angeles, Los Angeles, CA

Background:

Sleep problems are common in autism spectrum disorder (ASD) and often present prior to diagnosis (Guinchat et al., 2012). Although sleep is essential for neurodevelopment, the relationship between early sleep disruption and developing brain networks remains unclear. The salience network (SN), involved in detecting internal and external salient stimuli, is altered in ASD (Uddin et al., 2013). We recently showed atypical SN connectivity with sensorimotor and frontal regions in 1.5-month-old infants at high likelihood of ASD (Tsang et al., 2024). Interestingly, the SN is also altered in insomnia patients, suggesting a crucial role for SN connectivity in sleep regulation. Yet, the link between early sleep problems and SN connectivity in ASD remains poorly understood. Since 20% of infant siblings of autistic children will receive a diagnosis (Ozonoff et al., 2024), this population can offer important insights into the development of these early relationships.

Objectives:

This study examined how SN connectivity at 6 months relates to sleep-onset problems in infants at varying familial likelihood for ASD. Using an *a priori* approach informed by recent findings (Tsang et al., 2024), we focused on SN connectivity with sensorimotor and frontal regions.

Methods:

We used data collected as part of the Infant Brain Imaging Study (IBIS) (R01HD055741). Resting-state fMRI scans were acquired during natural sleep at 6 months (N=102) in infants with an older sibling with ASD (high likelihood: HL, N=63) and infants with no first- or second-degree relatives with ASD (typical likelihood: TL, N=39). Scans were preprocessed and analyzed using FMRIB's Software Library (FSL). Five items related to sleep initiation from the Infant Behavior Questionnaire were used to create the Infant Sleep-Onset Problems (ISOP) score, consistent with a prior study in the IBIS sample (MacDuffie et al., 2020). All analyses were conducted using the right anterior insula (rAI) - the hub of the SN - as the seed, masked by joint group-level functional connectivity maps or anatomical ROIs. ISOP scores at 6 months were used as regressors in a bottom-up analysis.

Results:

HL infants displayed weaker rAI connectivity with the right inferior frontal gyrus as compared to TL infants ($Z > 2.7$, $P < 0.05$). Regressions with 6-month ISOP scores demonstrated that HL infants with worse sleep-onset problems showed stronger rAI connectivity with right sensorimotor cortices ($Z > 2.3$, $P < 0.05$).

Conclusions:

Our finding that HL infants show weaker SN connectivity with the inferior frontal gyrus is consistent with our prior work in 1.5-month-old infants, indicating that this pattern of hypoconnectivity is consistent across the first 6 months of life. We also show that greater sleep-onset problems at 6 months are related to stronger SN connectivity with sensorimotor regions, suggesting that extraneous attention to sensory inputs may disrupt sleep in HL infants. This is in line with the literature linking sleep problems to sensory responsivity challenges in ASD (Lane et al., 2022) and suggests that the relationship between sleep patterns and sensory processing atypicalities is already present in early infancy.

420.134 Sex Differences in Developmental Trajectories of Early Vocal Contingency Predicting Later Autism Outcome**G. Ramsay¹**, M. Pileggi², N. Brane³, S. P. Pulver³ and C. Klaiman⁴, (1)Marcus Autism Center, Children's Healthcare of Atlanta, and Emory University School of Medicine, Atlanta, GA, (2)Marcus Autism Center, Emory University School of Medicine and Children's Healthcare of Atlanta, Atlanta, GA, (3)Marcus Autism Center, Atlanta, GA, (4)Emory University/Marcus Autism Center, Atlanta, GA

Background: Previous research on early social engagement in ASD identified developmental cascades in infant-caregiver vocal interaction within the first year of life that discriminate infants later diagnosed with autism from typically developing controls. Sex differences in infant vocal behavior have also been found that may reflect known differences in ASD prevalence between boys and girls, potentially shedding light on different pathways of disruption, but it is not yet known whether these are associated with later symptoms of autism. In this study, we aimed to determine whether trajectories of vocal development measured at the point where sex differences in ASD first emerge are related to dimensional outcomes at the age of diagnosis.

Objectives: The goal of this study was to determine whether trajectories of volubility and vocal contingency from 0-18 months predict autistic symptomatology at 2 years of age, in male and female infants.

Methods: As part of an NIH Autism Center of Excellence, we tracked vocal development in infant siblings and controls. Each child wore a LENA recorder one day every month from 0-24 months to provide audio recordings of their natural language environment. Using speech recognition technology, we identified the number of vocalizations per hour for infant and caregiver, and calculated the rate of contingent interactions based on timing statistics. Using Functional Data Analysis, we determined developmental trajectories for each child and mean developmental trajectories by group; permutation tests were used to identify significant differences between groups, based on sex and diagnosis. We also calculated the correlation between trajectory values at 6 months, when group differences first emerged, and ADOS-2 scores assessed at 24 months. In our sample, 39 children (26M:13F) were diagnosed with ASD and 94 (53M:41F) were typically developing.

Results: We found significant differences ($P<.05$) in developmental profiles for vocal contingency and infant volubility within the first year, between ASD and TD groups, and between male and female infants within each group (Figure 1). Male infants with ASD showed declines in contingency from birth, with declines in volubility from 6 months, whereas female infants with ASD recovered from deficits at birth almost to within the typical range by 12 months. Vocal contingency at 6 months significantly predicted ADOS Overall Total ($R=-0.20$, $P=.027$) and Social Affect ($R=-0.23$, $P=.011$) scores at 24 months in male but not female infants, although this may be due to sample size. No significant relationship ($P>.05$) was found between ADOS scores and infant volubility for either sex.

Conclusions: Developmental trajectories of vocal contingency within the first year predict outcome at two years, consistent with core social deficits in ASD, with significant sex differences from birth. Inflection points in infant volubility also appear around 6 months, but deficits in vocal contingency rather than infant volubility are the main predictor of autism. These results provide the earliest evidence for sex differences in ASD related to outcome, and suggest that early detection and intervention should focus on monitoring and stimulating infant-caregiver interaction from birth, but may need to be tailored to differences between boys and girls.



420.135 Sex Differences in Early Trajectories of Autism-Related Behaviors

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Background:

Compared to their male counterparts, autistic females are at higher risk of not receiving a timely diagnosis (McCormick et al., 2020), delaying access to support. Given that being diagnosed before four years of age rather than later is linked to improved quality of life outcomes among autistic people (Kamio et al., 2013), there is a need to facilitate timely recognition of autism. This requires an improved understanding of the autism manifestation in early childhood. However, knowledge regarding early sex differences in autism is limited and hampered by the scarcity of longitudinal research into the emergence of autistic characteristics in young girls and boys (McFayden et al., 2023). Here, prospective sibling designs following young children at elevated likelihood for autism (i.e., with an older sibling diagnosed with autism), and children at typical likelihood (with no autistic first-degree relative) can provide a platform for investigating early autism manifestations.

Objectives:

1. Investigate the male:female ratio of autism diagnosis in an elevated-likelihood sibling sample.
2. Investigate sex and group (autistic, non-autistic) differences in early developmental trajectories of autistic core domains (social communication challenges and RRBs), sensory processing, temperamental domains (negative affect, effortful control, extraversion/sociability), and language development.
3. Estimate the magnitude of differences between those diagnosed with autism at age three and non-autistic children, in boys and girls respectively.

Methods:

Participants took part in the Eurosibs project (Jones et al., 2019), and underwent assessments at five timepoints (5, 10, 14, 24, and 36 months). This study combines data from six research centers in four countries (Belgium, Netherlands, UK, Sweden). Based on sex assigned at birth and diagnostic assessments conducted at 36 months, early development in autistic and non-autistic girls and boys will be investigated. Currently, the data collection has been finalized and a complete dataset is being put together, with an estimated total sample size of $N = 757$. Mixed effect models will be utilized to investigate potential sex differences among autistic and non-autistic children in early trajectories of temperament, sensory processing, language development, and autistic characteristics.

Results:

Descriptive statistics from a currently available elevated-likelihood subsample (157 females, 174 males) indicate a male:female ratio of 1.6:1 (autistic girls, $n = 33$; autistic boys, $n = 52$; non-autistic girls, $n = 124$; non-autistic boys, $n = 122$). At age three, parent-rated autistic traits were significantly higher in autistic girls compared to non-autistic girls (mean = 73.7 vs 30.4). Similar but descriptively less pronounced differences were found when comparing autistic and non-autistic boys (65.6 vs 31.6).

Conclusions:

Our preliminary analysis suggests a substantially smaller male:female ratio than the 4:1 ratio often reported, in line with previous elevated likelihood sibling studies (Messinger et al., 2015; Zwaigenbaum et al., 2012). Girls diagnosed with autism at three years may differ more from same-aged non-autistic girls than diagnosed boys do in comparison to non-autistic boys. Planned analyses will follow up these results and investigate developmental trajectories of autism-related behaviors among girls and boys. Findings from the current study could help elucidate early emergence of autism in girls.

420.136 Shared Infant Neurostructural Substrates That Precede Auditory Processing Differences, Sensory-Related Anxiety and Autistic Traits in Toddlerhood

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Background:

Most autistic people (95%) experience sensory processing differences (SP). SP may precede and is associated with toddler autistic traits and may shape the development of autism (Robertson & Baron-Cohen, 2017). However, it remains unknown if SP and autistic traits share early neurostructural substrates.

Objectives:

We aimed to identify which infant regional grey matter volumes (GMVs) are associated with i) later auditory responsivity differences or ii) SP-associated affective behaviours (anxiety and emotional reactivity) and if these overlap with GMVs associated with iii) autistic traits in toddlerhood.

Methods:**Study 1:**

Using the Cambridge Human Imaging Longitudinal Discovery [CHILD] (n=27) cohort, we conducted a whole-brain analysis to determine if regional infant GMVs were associated with auditory responsivity differences on the Infant-Toddler Sensory Profile (ITSP) (Dunn & Daniels, 2002).

Study 2:

Using the Developing Human Connectome Project [DHCP] (n=444) and CHILD (n=27) cohorts, we conducted two independent whole-brain analyses to determine if regional infant GMVs were associated with SP-associated affective behaviours on the Child Behaviour Checklist (CBCL) (Achenbach & Ruffle, 2000).

For both studies 1 and 2, we tested whether these nominally significant regions were associated with autistic traits on the Quantitative Checklist for Autism in Toddlers (Q-CHAT) (Allison et al., 2008). If significant, the interaction effect of a family history of autism was tested on the GMV association with Q-CHAT in CHILD, along with a mediation effect by the GMV on the CBCL and Q-CHAT association in DHCP.

For each analysis, we adjusted regional GMVs for age and intracranial volume (ICV). We then tested their association with the outcome of interest in multiple linear regression models, controlling for sex and age corrected for gestational age. FDR-corrected results are displayed (q).

Results:

In Study 1 with CHILD (n=27), the right superior temporal pole GMV at 10-11 weeks post-birth negatively associated with more auditory responsivity differences at 18 months ($p=0.03$; $q=0.60$) and autistic traits ($p=0.04$; $q=0.16$) at 24-36 months.

In Study 2 with CHILD (n=27), the right superior temporal pole (STP) and superior temporal gyrus (STG) GMV at 10-11 weeks post-birth were negatively associated with more SP-affective behaviour (STP: $p=0.04$; $q=0.18$; STG: $p=0.01$; $q=0.54$) and autistic traits (STP: $p=0.04$; $q=0.16$; STG: $p=0.02$; $q=0.14$) at 24-36 months. Autism in the family ($q<0.01$) significantly interacted with the association between the STG GMV and autistic traits (Figure 1).

In Study 2 with DHCP (n=444), the left parahippocampal gyrus and ambiens GMV at 1.5-1.8 weeks after birth was positively associated with SP-affective behaviour ($p=0.04$; $q=0.70$) and autistic traits ($q<0.01$) at 18 months (Figure 2) and partially mediated the association between anxious behaviour and autistic traits in the DHCP ($p=0.04$).

Conclusions:

Our findings indicate that toddler sensory processing (SP), associated emotional behaviours (such as anxiety), and autistic traits share neural correlates in the temporal lobe before 10-11 weeks. This study provides the first neurodevelopmental evidence of shared neurostructural substrates between SP and autistic traits in early infancy, based on comprehensive analyses in several cohorts. Future research will explore their shared development through connectivity.

**420.137 Sleep Problems and Emergent Indicators of Autism in the First Year of Life**

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Background: Sleep difficulties commonly co-occur with autism and are associated with symptom presentation and functional status in autistic children and adolescents. Evidence from infant sibling samples suggests that sleep problems may also be present in infancy prior to diagnosis. Nonetheless, prospective data on the early emergence of sleep difficulties in relation to autism remains rather limited, especially in general birth cohorts.

Objectives: Testing the presence of sleep difficulties in infants with emerging indicators of autism in a general birth cohort accounting for racial/ethnic minority status and maternal education.

Methods: Participants were 506 children (246 females; 370 White, non-Hispanic) from an ongoing longitudinal birth cohort study. At 9 and 12 months of age, primary caregivers completed the Survey of Well-being of Young Children (SWYC), including questions about sleep. Early autism indicators were measured by the First Year Inventory-Lite (FYI-Lite, v3.1b) at 12 months, yielding the Social Communication (SC) and Sensory Regulatory (SR) scales, and an overall categorization of autism likelihood. Participants were grouped by the presence of sleep problems at both 9 and 12 months ($n=60$), at only 9 months ($n=61$), at only 12 months ($n=44$), and no sleep problems ($n=341$). ANOVAs were conducted to compare the FYI-Lite continuous SC and SR scale scores of the sleep-defined groups, with infant sex in the models. Contingency models, stratified by racial/ethnic minority status and maternal education, tested the prediction of elevated autism indicators on the FYI-Lite from the presence of sleep problems at 9 months.

Results: ANOVAs revealed a significant main effect for sleep-defined groups on the FYI-Lite SR subscale score, $F(3) = 8.73$, $p < 0.001$, but no effect of sex or sleep-group by sex interaction. Pairwise comparisons revealed that infants with sleep problems at both 9 and 12 months, and those with sleep problems at 12 months, had higher FYI-SR scores (vs no sleep problems at 12 months). The ANOVA predicting the FYI-SC subscale scores did not have any significant main effects or interaction. Contingency analyses revealed that sleep problems at 9 months predicted elevated (above threshold) autism FYI-Lite scores at 12 months as compared to infants without 9-month sleep problems ($RR = 2.33$; 95% CI: 1.35, 4.02). Stratification analyses revealed effect modification for minority status. Specifically, 9-month sleep problems predicted 12-month elevated FYI-Lite scores more strongly in minority ($RR = 4.01$, 95% CI: 2.08, 7.80) than non-minority participants ($RR = 0.89$, 95% CI: 0.31, 2.61). In contrast, there was a trend for 9-month sleep problems to more strongly predict elevated FYI-Lite scores in infants whose mothers had a college degree ($RR = 4.02$; 95% CI: 0.80, 3.11) than for those with less than a college degree ($RR = 1.58$; 95% CI: 1.55, 10.40).

Conclusions: These findings provide further evidence of emerging sleep problems as predictors of early emerging autism indicators at 12 months of age in a general population sample. Additionally, these findings indicate that demographic characteristics will need to be thoughtfully incorporated into predictive models and when assessing the relationship between infant sleep difficulties and emerging autism behaviors.



420.138 Social Communication Milestone Attainment and Emerging Autism Indicators By Caregiver Report in a General Population Birth Cohort

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Background: Early developmental milestones, including social communication abilities, may be delayed in infants later diagnosed with autism. Limited data are available describing developmental trajectories associated with autism likelihood in the general population. Caregiver characteristics may impact their report of infant behavior and milestones.

Objectives: To test whether infants with elevated indicators of autism at 12 months have delayed attainment of developmental milestones earlier in infancy while accounting for maternal self-reported subclinical autism characteristics in a general birth cohort.

Methods: Participants were 212 children (108 males; 173 White/Non-Hispanic) from an ongoing longitudinal study. At 6, 9, and 12 months of age, mothers completed the Survey of Well-being of Young Children (SWYC) about their infant, including the 10-item developmental milestones scale, adapted to include key milestones at all ages. At 12 months, caregivers completed the First Year Inventory-Lite (FYI-Lite, v3.1b) about their infant, yielding two subscales of early autism indicators: Social Communication (FYI-SC) and Sensory Regulatory (FYI-SR). Mothers also completed the Broad Autism Phenotype Questionnaire (BAPQ) as a self-report of their own subclinical autistic traits, yielding three subscales: Rigid, Aloof, and Pragmatic Language. Infant FYI-Lite scores correlated significantly with maternal BAPQ scores ($p's < 0.05$), with the strongest correlation between the FYI-SC and the BAPQ-Aloof subscales ($r = 0.34$). This informed group stratification for an ANOVA comparing mean milestone scores by stratified group and age, as well as item-level descriptive analyses. We divided the participants into four groups based on mothers' BAPQ-Aloof scores and infants' FYI-SC scores: (1) dyads above both thresholds ($n=29$), (2) only mothers above threshold ($n=47$), (3) only infants above threshold ($n=22$), and (4) neither mother nor infant above either threshold ($n=108$).

Results: Significant effects were found for stratification group ($F(3) = 16.35$, $p < 0.001$), infant age ($F(2) = 21.12$, $p < 0.001$), and the group by age interaction ($F(6) = 3.92$, $p < 0.001$). Follow up tests revealed that both groups of infants who had elevated FYI-SC scores had lower SWYC milestone scores than both low FYI-SC groups, regardless of mothers BAPQ scores ($p's < 0.05$). Dyads with above threshold scores on infant and maternal measures had the lowest SWYC-milestone scores at all age points and no change over time in their milestone scores, whereas SWYC milestone scores increased by age for dyads with infants with low FYI-SC scores. Milestone scores were higher and not different from one another for dyads with infants with low FYI-SC scores (Figure 1). Item-level visualization revealed differential social communication milestone attainment between groups of infants above and below threshold on the FYI-SC, including a striking decrease in response-to-name at 12 months for both groups of infants above threshold on the FYI-SC (Figure 2).

Conclusions: Developmental and social-communication milestones are delayed at the group level in infants with emerging indicators of autism. Elevated maternal self-report of subclinical autism characteristics accounted for some but not all variation in milestone attainment. These findings have implications for understanding the emergence of autism in general population cohorts.



420.139 Stages of Brain Processing in Infants Associate with Early Versus Later Autism Diagnosis

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Background:

The expression of autism traits sufficient to meet criteria for a diagnosis can occur early (around 2-3 years) or later (mid-childhood and onwards) in development and age of onset may serve as a useful stratification marker. Studies of infants with a family history of autism ('infant sibs') have typically reported on prognostic infant biomarkers in relation to 2- or 3-year clinical outcomes but have not commonly followed these children up to compare children later meeting diagnostic criteria for autism.

Objectives:

We report on the associations between previously established infant marker of 3-year autism outcome, namely event-related potentials (ERPs) generated by the brain when viewing faces, in relation to those with an early versus later autism outcome.

Methods:

A sample of 113 infant sibs (50% Female; all with an older diagnosed sibling) aged 6-10 months had EEG recorded whilst viewing faces (face versus noise: N290 or gaze towards versus away: P1, P400) and attended a diagnostic visit at both 3 years and mid-childhood (6-12 years). Diagnostic autism outcome was determined based on DSM-5 or ICD-10 criteria by the research team led by a clinician. Decision was based on clinical and developmental questionnaires, interviews and observations, including the autism diagnostic interview/observation schedule (ADI/ADOS). Children were then categorised in those with early autism (diagnosed at age 3 years), later autism (diagnosed at mid-childhood, but not at 3 years) and no autism. ERPs were compared using mixed models including the main and interaction effects of condition and group, followed by an ANOVA to understand significant effects. Dimensional associations between ERPs (difference scores between conditions) and mid-childhood autism traits of social communication and interaction (SCI) and restricted and repetitive behaviour (RRB) measured using the Social Responsiveness Scale were assessed using Kendall Tau correlations.

Results:

A short P1 latency response did not associate with autism outcome. There was a condition-by-group interaction effect for the mid-latency N290 component ($\chi^2(2) = 8.36, p=.015$) and an ANOVA confirmed a significant difference between the early (longer latencies to noise versus faces) versus later ($p=.024$) and no autism ($p=.007$) groups (opposite pattern). There was also a significant interaction effect for the later P400 latency component ($\chi^2(2) = 13.34, p=.001$), showing a significant difference between the early ($p=.001$) and later ($p=.035$, although .070 after correction) autism groups (longer latency to towards versus away) compared to the no autism group (opposite pattern), with no difference between early and later autism. Amplitude models did not show any significant effect of group. There was a significant association between P400 latency and both SCI (.20, $p=.005$) and RRB (.21, $p=.003$), such that a slower response to gaze towards versus away was associated with higher mid-childhood autism symptoms.

Conclusions:

Our evidence supports hypothesised causal mechanisms that are reflected in increasing effects as real-time neural processing takes place. Different stages of face processing in infancy differentially associate with age of autism presentation such that an earlier age of diagnosis is associated with earlier stage disruption within the event-related waveform in response to a social stimulus (faces).



420.140 Strategies Caregivers Use to Support Toddlers with Autism Spectrum Disorder during Moments of Dysregulation

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Background: Caregivers play a crucial role in supporting the development of their toddlers with autism spectrum disorder (ASD). One area of development is emotion regulation in which young children increasingly become more regulated over age with co-regulation strategies employed by their caregivers. Understanding the strategies caregivers use prior to intervention has implications for tailoring intervention approaches to the caregiver.

Objectives: This study aims to describe the strategies caregivers utilize with their toddler with ASD during periods of dysregulation (fussiness, crying).

Methods: Participants consisted of 149 toddlers with ASD (M age = 21 months) and their caregivers. Caregivers were observed and recorded playing with their toddlers for 10 minutes. The toddler's dysregulation behaviors and the caregiver's response to that behavior were coded.

Dysregulation behaviors were coded for (a) type and (b) duration (proportion of time in seconds). Caregiver strategies consisted of nine different strategies, which were then grouped into three composite codes: active (e.g., active involvement from the caregiver, redirection), avoidance (e.g., minimal involvement or ignoring from caregiver), and verbal (verbal/vocal involvement from caregiver). Proportion of time spent utilizing the caregiver strategy was used for analysis. Descriptive statistics and correlational analyses were conducted.

Results: Caregivers utilized active strategies 46% of the time, avoidance strategies 34% of the time, and verbal strategies 9% of the time. Most caregivers (44%) opted to use between two to three different strategies. 16% of caregivers utilized a much wider range of strategies (between four to six different strategies), while 19% of caregivers used only one strategy throughout the 10-minute interaction. Bivariate correlational analysis revealed that caregiver active strategies were positively associated with time dysregulated ($r(147) = .260, p = .001$). Caregivers utilized active strategies most often during specific dysregulation behaviors, including negativity (e.g., crying, upset), idiosyncratic behaviors (e.g., repetitive actions), or child avoidant behaviors (e.g., child moves away from caregiver). Caregiver's use of avoid strategies was also positively associated with time dysregulated ($r(147) = .196, p = .017$). Caregivers utilized avoid strategies most often during physical venting behaviors (e.g., child jumping up and down) and vocalizations (e.g., child singing).

Conclusions: Results suggest that caregivers are responding to their child's dysregulation utilizing a variety of strategies. Caregivers seem to use active strategies (e.g., redirection) most often during child's negative, avoidant or repetitive dysregulation behaviors, while caregivers may avoid (or ignore) when children are physically venting or vocalizing. Future studies should examine which strategies predict *less time* dysregulated over time. Understanding which strategies may improve the toddler's ability to regulate their emotions is crucial and may pave the way for supporting caregiver child relationships and increasing social communication learning opportunities.



420.141 Testing Associations between Implementation Support Networks and the Adaptive Behavior of Non-Speaking Autistic Children

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Background: Non-speaking children on the autism spectrum with adaptive behavioral challenges are at particular risk for severe behavioral disturbances, resulting in greater safety risks, tremendous emotional, and economic burdens for their caregivers as well as enormous societal costs. Determining if modifiable factors, such as the level of implementation collaboration among professionals and caregivers, are associated with child adaptive behavior functioning, would provide guidance about how to best improve outcomes for non-speaking children on the autism spectrum. However, no research has addressed the association between collaboration dynamics in autism early intervention and adaptive behavior functioning.

Objectives: To characterize the implementation network structure of collaboration for non-speaking autistic children in school settings and examine whether variation in network structure is associated with children's overall adaptive behavior scores.

Methods: Caregivers of 18 non-speaking autistic children (mean=4.5 years) from diverse cultural and socioeconomic backgrounds were recruited. A "name generator" question (Burt, 1984) identified supporters in home, community, school, and healthcare settings. Virtual interviews (30-90 minutes) were used to collect social network data, analyzed using RStudio (v4.4.1) with the igraph package. Network structural measures (centralization, information flow, node variation) were calculated to assess network quality. Children were grouped into high ($n=8$) and low ($n=10$) adaptive behavior categories based on ABC domain scores. The Kruskal-Wallis test was used to assess statistical significance between the groups. **Results:** Mean network constraint was significantly higher ($p = 0.0025$) in the high ABC group (mean = 0.8, SD = 0.2) compared to the low ABC group (mean = 0.4, SD = 0.3), indicating that the quality of implementation collaboration was more centrally connected around a few well connected members for children with higher adaptive behaviors. Additionally, the variation in eigenvector node centrality, which measures how influential a member is within the network, was significantly higher in the high ABC group (mean = 0.4, SD = 0.1) compared to the low ABC group (mean = 0.2, SD = 0.2). This suggests that in the high ABC group, some network members have a much stronger influence than others ($p = 0.0162$). There was also a trend toward higher eigenvector network centralization in the high ABC group (mean = 0.6, SD = 0.3) compared to the low ABC group (mean = 0.4, SD = 0.3), though this did not reach statistical significance ($p = 0.075$). Other network characteristics such as network size, density, number of isolates, links, and various centrality measures (degree, betweenness, closeness) showed no significant differences between the groups (all $p > 0.05$), suggesting that overall network structure was similar regardless of adaptive behavior composite score.

Conclusions: Our findings show that non-speaking autistic children with higher adaptive behavior have more constrained, cohesive social networks, characterized by tightly knit support. In contrast, those with lower adaptive behavior have more fragmented networks. These results emphasize that network structure, not just size, influences adaptive functioning and may enhance support for these children.



420.142 The Contribution of Genes and Environments to Infant EEG Measures

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Background: EEG has been used widely in infancy and ‘early autism’ research, and individual differences in some EEG metrics infancy have been linked to autism diagnosis in toddlerhood in some studies (e.g. Gabard-Durnam, L. J. et al, 2019; O’Reilly, C. et al, 2023). There is very little work on etiological factors influencing different EEG variables in infancy (Orekhova, E. V. et al, 2003). This knowledge could be informative for future studies looking into the link between early brain development and later differences in socio-communicative development.

Objectives: The overall purpose of this study is to provide an overview of early EEG measures’ etiological influences, in terms of additive genetics, shared environment and unique environment.

Methods: We assessed the contribution of genes and environments to four types of EEG measures: relative bandpower, functional connectivity, network properties, and phase-amplitude coupling in theta, alpha, and gamma brain rhythms. All measures were extracted while the infants looked at either a social video stimulus (woman talking to the child), or a non-social control stimulus (moving toys with sound). This was done in a sample of infant twins (Babytwins Study Sweden; BATSS; $n = 569$; approximately 50% were monozygotic, see Falck-Ytter et al 2021 for details). We employed a classical twin modelling approach, which involves comparing the degree of similarity between monozygotic twins, who share 100% of their segregating genetic material, and dizygotic twins, who share approximately 50%. Using univariate twin models, we estimated the relative contributions of genetic and environmental factors to the variation in a given phenotype by analyzing the correlations between twins. This variation or covariation is partitioned into three components: additive genetic influences (A, or heritability, which increases similarity between twins), non-shared environment (E, influences unique to each twin that reduce similarity, including measurement error), and shared environment (C, environmental factors that increase similarity between twins regardless of zygosity, such as family socioeconomic status). Both A and C represent familial effects, that is, traits that run in families.

Results: Relative bandpower showed substantially more familial effects (primarily additive genetic) than either functional connectivity or network properties measure. Over 83% of the band power variables showed a heritability above 40%, while only less than 3% of the functional connectivity measure and none of the network properties measure showed a heritability above 40%. **Figures 1a** and **1b** summarize the findings for bandpower.

Conclusions: That band power showed much higher familiarity (predominantly genetic effects) than the other measures suggest that these measures are stable traits that run in families and which can be reliably assessed in early infancy. Low familiarity may indicate lower reliability for some of the other EEG measures (van der Velde, B. et al 2019). Because autism is highly heritable, the current results point to band power-based measures as the most promising early EEG markers of autistic development.

Figure 1. ACE estimates of relative bandpower measures for non-social (**a**) and social stimuli (**b**). front=frontal lobe, parie=parietal lobe, ltemp=left-temporal lobe, rtemp=right-temporal lobe, occip=occipital lobe, and whole=whole scalp; alpha=alpha band, gamma=gamma band, theta=theta band.



420.143 The Impact of Developmental Delays and Gender on Play Behaviors in Children with ASD: Insights from the Escbq-2 Total and Pretend Play Scales

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Background:

Play is a critical component of early childhood development, particularly in fostering social and communicative behaviors. To assess these behaviors in children under 30 months, the Early Social Communicative Behavior Questionnaire, with 108 items (ESCBQ; Blijd-Hoogewys & Buruma, 2009), was developed. The updated version, ESCBQ-2, with 58 items, has shown strong psychometric properties, including high internal consistency and test-retest reliability. Of these items, 13 specifically assess play, with 3 focusing on pretend play. Understanding how developmental delays and gender influence these behaviors is crucial for early detection and intervention in autistic children.

Objectives:

This study aimed to examine differences in play behaviors between autistic children with and without developmental delays, taking gender into account, using the ESCBQ-2 Total Play and Pretend Play scales.

Methods:

The sample included 300 children diagnosed with ASD (208 boys, $M = 3.83$ years, $SD = 1.19$; 92 girls, $M = 3.91$ years, $SD = 1.58$). Developmental delays were present in 153 children (115 boys, 38 girls). Independent t-tests were conducted to assess group differences in play behaviors by gender and developmental delay. A two-way ANOVA further examined the interaction effects of gender and developmental delay on the ESCBQ-2 Total Play and Pretend Play scales.

Results:

No significant differences were found between autistic boys and autistic girls on the ESCBQ-2 Total Play ($t = 0.16$, $p = 0.87$) or Pretend Play scales ($t = 0.27$, $p = 0.79$). However, autistic children with developmental delays scored significantly lower on the Pretend Play scale compared to those without delays ($t = -2.12$, $p = 0.035$) (for more results, see Table1). The two-way ANOVA revealed significant interactions between gender and developmental delay for both the ESCBQ-2 Total Play ($p = 0.042$) and Pretend Play scales ($p = 0.038$), indicating that the combination of these factors affects play behavior. However, no significant main effects of gender or developmental delay alone were observed on these two scales. Developmental delay alone had a significant effect on Pretend Play ($F = 4.72$, $p = 0.031$), independent of gender.

Conclusions:

These findings highlight the complex interplay between gender and developmental delay in shaping play behaviors in autistic children. While no significant gender differences were observed, developmental delay significantly impacted pretend play, aligning with previous research suggesting minimal gender differences in play behavior among autistic children under 5 years old (Petrout et al., 2018). This underscores the importance of accounting for developmental delays when assessing social and communicative play. A key limitation of this study is the narrow focus on a subset of play items, limiting the generalizability of these results. Future research should expand the scope of play-related items to provide a more comprehensive understanding of how developmental delays and gender affect various aspects of play in autistic children.



420.144 The Impact of Parental Mental Health on Child Self-Regulation Outcomes within Behavioral Therapy for Disruptive Behavior

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Background: Children with autism spectrum disorder (ASD) experience significant impairments in self-regulation across the domains of executive functioning (EF; Anderson et al., 2015) and emotion regulation (ER; Mazefsky et al., 2013). Although parenting styles may impact self-regulation (Karreman et al., 2006), less is known about the impact of parental mental health, including distress related to parenting and diagnostic history. Given the key role that parents play within behavioral interventions for young children, it is also important to examine the stability of these associations after treatment. Although disruptive behavior problems are the target for interventions like Parent Child Interaction Therapy (PCIT), impacts on child self-regulation have been documented. It remains unknown whether parent factors may also influence post-treatment self-regulatory functioning.

Objectives: The purpose of the current study was to (a) examine the effect of parental diagnostic history and parenting stress on domains of ER and EF and (b) determine whether these associations hold after completion of a behavioral parenting intervention.

Methods: Participants included 73 children ($M_{age} = 4.9$) with a diagnosis of ASD and clinically significant disruptive behavior problems. Parents rated EF and ER on the Behavior Assessment System for Children-Third Edition. Parents also reported on their mental health diagnostic history and parental distress on the Parenting Stress Index. Children were administered the Peabody Picture Vocabulary Test as a measure of child verbal skills, which was included as a co-variate in all analyses. Child and parent ER was also measured via observational coding (ongoing). Half of the sample was randomized to receive PCIT via telehealth and all measures were repeated at post-treatment.

Results: As seen in Table 1, Parental endorsement of mental health diagnosis and higher distress were associated with higher child emotional self-control problems ($b = .24$ & $b = .27$, respectively, $p < .05$). Similarly, both parent diagnosis and distress were associated with child negative emotionality ($b = .29$, $p < .05$ & $b = .34$, $p < .01$, respectively). Conversely, only parental distress was associated with higher child executive functioning problems ($b = .34$, $p < .01$; See Table 2). These associations did not hold when examining post-treatment outcomes for families that received PCIT. Child emotional self-control, negative emotionality, and executive functioning at post-treatment were not associated with parent diagnosis or post-treatment parent distress ($n = 32/40$ complete, $ps > .10$).

Conclusions: Results highlight the association between parental mental health factors (i.e., diagnosis and distress related to parenting) and child emotion regulatory abilities across domains of ER. Findings also indicated that while these parenting factors may have a more robust effect on child ER, child EF is associated with parental distress but not parental diagnostic history. Outcomes for families that have completed therapy thus far, indicate that behavioral parenting therapies have the potential to improve these negative associations. Treatment participation may be conceptualized as a moderator of the associations between parent factors and child self-regulatory functioning.

**420.145** Towards Understanding Heterogeneity in ASD: Presence of Oppositional Behaviors in Young Children with Autism

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Background: Symptoms of oppositional defiance (OD), including irritable mood and defiant behavior, are present in up to 28% of children with ASD and are associated with higher rates of depression and antisocial behaviors in adolescence than ASD alone. Although oppositional defiant disorder (ODD) is thought to be a neurodevelopmental disorder with an early onset, diagnoses are typically not made until late childhood. While functional neuroimaging studies have implicated altered amygdala connectivity in both ASD and ODD, little is known about trajectories of brain and behavioral development in young children with ASD and co-occurring OD symptoms. Understanding these trajectories will inform early interventions during a critical developmental period when they have the most potential for positive impact.

Objectives: Examine whether preschoolers with ASD and clinically significant OD symptoms (ASD+OD) differ on a) adaptive and developmental skills and autism-associated behaviors, and b) functional connectivity (FC) of the amygdala, from their peers with ASD (with no elevated OD symptoms).

Methods: Participants include 71 young children with ASD (mean age = 39.2 ± 14 mo) and 53 typically developing children (TD; mean age = 33.9 ± 16.1 mo) enrolled in the SDSU Toddler MRI Project. OD symptoms were quantified using the OD subscale of the Child Behavior Checklist, with 17 children with ASD having clinically significant OD (using $T > 65$ cutoff). Adaptive and developmental skills were assessed using the Vineland Adaptive Behavior Scales standard scores and Mullen Scales of Early Learning developmental quotient (DQ) scores, respectively, and autism-related behaviors were measured using the ADOS-2. FC between the amygdala and canonical resting state networks was estimated from fMRI data acquired during natural sleep.

Results: Overall, young children with ASD had significantly higher OD symptoms than TD peers ($\beta = 7.14$, $p < .001$). Children with ASD+OD had significantly higher developmental skills than children with ASD alone. This included greater non-verbal reasoning skills (Mullen Visual Reception: $\beta = 15.16$, $p = .045$) and expressive language ($\beta = 17.27$, $p = .018$), as well as greater overall Early Learning Composite scores ($\beta = 12.90$, $p = .011$). Children with ASD+OD did not differ from children with ASD alone on adaptive skills (all $p > .05$) or autism-related behaviors (all $p > .05$). Children with ASD+OD showed reduced FC between the amygdala and the sensorimotor ($\beta = -.07$, $p = .031$) and language ($\beta = -.07$, $p = .056$) networks.

Conclusions: These findings provide further evidence that OD symptoms are elevated in children with ASD as early as at 3 years of age. Unexpectedly, having elevated OD symptoms was associated with greater developmental skills in young children with ASD. Further, children with ASD and elevated OD symptoms had altered connectivity of the amygdala, sensorimotor, and language networks relative to their peers with ASD alone. These results suggest that early OD symptoms in ASD are associated with unique behavioral and neurodevelopmental patterns, likely contributing to the broad heterogeneity in ASD. Further longitudinal study is warranted to track these trajectories into later childhood and adolescence, to inform targeted early intervention.

420.146 Trajectories of Early Dyadic Synchrony in Infants Developing Autism or Concerns for ADHD

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Background: In early life, interactions between children and caregivers become more temporally coordinated (i.e., synchronous), creating opportunities for learning that can have cascading effects on development. Synchrony has been positively associated with various developmental outcomes, including self-regulation and social communication (Leclère et al., 2014). Differences in the structure of interpersonal interactions, including reduced synchrony, have been reported in older children and adults diagnosed with autism or ADHD (Bowsher-Murray et al., 2022; Cunningham & Barkley, 1979; McNaughton & Redcay, 2020; Murat Baldwin et al., 2022; Gvirts Problovski et al., 2021; Zampella et al., 2020), neurodevelopmental conditions which commonly co-occur and have overlapping early markers. However, the literature on dyadic synchrony in the context of autism and ADHD has mainly involved infants at elevated likelihood for autism who display a wide range of clinical outcomes in addition to autism. Further, studies have been limited by cross-sectional designs with a single-condition focus, narrow age ranges, a wide range of synchrony metrics, an emphasis on familial likelihood or diagnostic outcome, and small sample sizes.

Objectives: We examined trajectories of early dyadic synchrony from 6 to 36 months of age in a prospectively followed sample of infants at elevated and average likelihood for autism or ADHD, including contributions of social partner and behavior type.

Methods: Data were gathered from infants with family histories of autism ($n=99$) or ADHD ($n=46$) or no history of either ($n=40$). At 36 months, participants were classified into one of three outcome groups: Autism ($n=20$), ADHD Concerns ($n=28$), or Comparison ($n=115$), according to pre-existing algorithms (Reetzke et al., 2022). At 6, 12, 18, 24, and 36 months, caregiver-child dyads participated in a video-recorded semi-structured play task. Behaviors of interest—gaze to faces, gaze to objects, positive affect, and vocalizations—were coded on a micro-level for each caregiver and child individually. Exchanges were considered synchronous when the behavior of one social partner matched that of the other social partner within two seconds. Linear mixed-effects models and post-hoc linear contrasts following significant interaction effects were employed to assess group differences in the percentage of synchronous behaviors (overall, by social partner, and by behavior type) over time.

Results: Across models, all three outcome groups demonstrated an increase in the percentage of synchronous behaviors from 6 to 36 months of age, with the Autism group differing from the ADHD Concerns and/or Comparison groups in rate of change (see Figure 1). Relative to the other groups, the Autism group generally had a smaller mean percentage of synchronous behaviors from 12-18 to 24-36 months (Figure 1; $ps<.05$). The ADHD Concerns group did not differ from the Comparison group in any model.

Conclusions: Early dyadic synchrony follows different trajectories in infants developing autism versus infants developing concerns for ADHD and comparison infants. However, by 36 months, synchrony in the Autism group was closer to the other groups, possibly due to the receipt of services. Future work should consider use of more refined metrics of dyadic synchrony which capture multimodal exchanges and include behaviors that are potentially more relevant to ADHD.

**420.147** Transdiagnostic Clustering of Cognitive Development and Spectral Power in Infants at Elevated Likelihood of Autism and ADHD

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Background:

High heterogeneity within autism, along with frequent overlap with ADHD, has led to a transdiagnostic approach for studying these neurodevelopmental conditions. Siugzdaite et al. (2020) used growing hierarchical self-organising maps to show that cognitive and brain profiles of children aged 5 to 18 years did not align with categorical diagnoses of ADHD, autism and dyslexia, and that relationships between individuals' cognitive and brain profiles were not one-to-one. This suggests that diagnostic categories fail to capture the underlying basis about how developmental difficulties arise and a transdiagnostic view may be more appropriate when considering the needs of children with neurodevelopmental conditions.

Objectives:

The current study aimed to use clustering to investigate the cognitive and spectral power profiles of infants from the British Autism Study of Infant Siblings (BASIS) Phase 3 - Studying Autism and ADHD in the eaRly yearS (STAARS).

Methods:

BASIS-STAARS is a prospective longitudinal study on individuals at elevated likelihood for autism and ADHD. It uses an infant-sibling design, as infants whose first-degree family member(s) have an autism diagnosis show higher likelihood for receiving a diagnosis. Mullen Scales for Early Learning subscale scores were used to stratify subjects into cognitive clusters (age=24 months, N=127). Neural clusters were derived from relative electroencephalography (EEG) power in infant beta, alpha and theta frequency bands (age=24 months, N=124). Hierarchical density-based clustering with applications to noise (HDBSCAN) was used to stratify cognitive and EEG data separately. The relationships between subgroups were examined across modalities (cognitive and EEG), as well as between subgroups of the same modality using the Vineland adaptive behaviour composite (age=24 months), ADOS-2 and ADI-R autistic traits and CBCL externalising behaviours (age = 36 months), and family history of autism and ADHD (summarised in **Figure 1**).

Results:

Clustering of cognitive and of EEG data resulted in a large, homogeneous cluster, which was compared against a subgroup made up of a small cluster, and heterogeneous points that were classified as outliers. The main cognitive cluster (prop=54%) had a higher average and lower spread in scores compared to the outlier subgroup across all scales (**Figure 2a**), as well as in adaptive behaviour. The main EEG cluster (prop=78%) had a lower average and higher spread of beta and alpha power, and higher average theta power (**Figure 2a**). Data-driven subgroups were not associated with family history of autism and/or ADHD (**Figure 2b**). Individuals from one cognitive subgroup mapped onto different EEG subgroups and vice versa, with no overall association between modalities. ADI measures of social communication and repetitive behaviours were higher in the main cognitive cluster compared to the outlier subgroup, while other diagnostic traits showed no difference. EEG subgroups did not differ in adaptive behaviour or diagnostic traits.

Conclusions:

Cluster-derived subgroups of cognitive ability did not relate to those of EEG power at 24 months, nor did they align with family history. Cognitive but not EEG subgroups showed differences in some measures of autism but not ADHD traits at 36 months. This lends support to the transdiagnostic view of neurodevelopmental conditions in early development.



420.148 Understanding Convergent and Divergent Validity across Multiple Measures of Emotion Regulation in Autistic Preschoolers

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Background: Emotion regulation (ER) is a transdiagnostic process that involves the process of emotion reactivity and modification of arousal. As a multidimensional construct, ER is characterized both by frustration (increase in dysregulation), which appears to be similar for all toddlers and soothability (increase in regulation), which appears to be more difficult for autistic compared to neurotypical toddlers (Edmunds et al., 2024). Previous assessments for ER primarily relied on behavioral observation, clinical, and biologically based methods that have not been validated with Autistic individuals (Mazefsky et al., 2013). Thus, measures have been more recently developed to assess ER in school aged autistic children (EDI; Mazefsky et al., 2020). However, evidence suggests that there are distinct features of ER in early childhood (between ages 2 and 5) that were not captured in current measures (Day et al., 2022). As validated measures of ER in early childhood emerge, despite purporting to all measure ER or aspects of ER, their convergent validity for autistic toddlers has yet to be determined.

Objectives: In the current study, we aim to evaluate the convergent and divergent validity of three measures that index constructs within emotion regulation, to understand the variability in ER within autism.

Methods: Data were collected from 26 autistic children who participated in a study to understand challenging behavior, emotion regulation, and sleep in toddlers with Autism and typical development. The children were between the ages of 2-5 years old (M = 44 months, SD = 12 months), 69.23% male, and 38.46% white. Families completed the Vineland 3rd edition Coping Skills scale, the BREIF-P Emotional Control scale, and the EDI-YC Reactivity scale which were used to measure convergent validity. These measures were evaluated against a measure of non-verbal cognition (DAS-II or Mullen nonverbal developmental quotient) to assess divergent validity.

Results: The results indicated a significant positive correlation ($r = .56, p < .01$) between the EDI-YC reactivity measure and the Brief-P Emotional Control scale with a large effect size as indicated by a Cohen's d of 1.33. The measures were not significantly correlated with the Vineland- 3 coping skills measure, but the effect sizes were large ($ds = -.91$ and -1.07 respectively). There was a non-significant correlation of all three ER-related measures with the measure of nonverbal cognition.

Conclusions: We found mixed evidence for convergent validity across three ER measures commonly used with autistic children, as well as evidence for divergent validity (i.e., ER was not significantly correlated to an unrelated construct, nonverbal cognition). Specifically, there was stronger evidence for convergent validity for the two measures that evaluated the absence of ER skills (i.e., emotion dysregulation) in autistic children, than for the measure that assessed the presence of ER skills. Emotion regulation spans a broad skill set which may present a challenge in confirming convergent validity among the variety of ER-related measures available. These results provide initial support for understanding both the overlap and variability across measures of emotion regulation in young children with autism.



420.149 Understanding Variation in Provider Referral Rates to Early Intervention for Children with Developmental Delays

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Background:

Early detection and treatment of developmental disabilities (DD), including Autism Spectrum Disorder (ASD), improves language, IQ, and adaptive outcomes. Guidelines recommend referral to Early Intervention (EI) upon positive ASD/DD screening in infant/toddler well child checks. However, children screening positive for ASD/DD are not always referred to EI.

Objectives: This project aimed to understand why pediatricians do and do not refer children with positive ASD/DD screens to EI.

Methods: We conducted qualitative interviews with pediatricians who participated in Autism ALERT, a pilot trial of family navigation for children with autism symptoms. We determined pediatrician EI referral rates after positive ASD or DD screeners using previously-collected data, then selected pediatricians with a range of referral rates for interviews. Interview guide questions probed the referral decision-making process; a Chart Stimulated Recall explored clinical management of 2 of the pediatrician's prior patient cases with positive screens. Transcripts were coded in Dedoose by 2 investigators using phenomenology; the coding framework was improved as themes emerged. Coding discrepancies were resolved by consensus.

Results:

15 pediatricians participated from 7 Oregon clinics (11 rural, 4 urban). Three themes influencing referral decisions emerged: (1) provider's clinical observations, (2) parental context, and (3) screening tool results (Figure, Table). The first theme, Providers' clinical observations, included having adequate time with child/family, clinical experience diagnosing DD, and trust building with parents.

The theme "parental context" included readiness for referral (influenced by competing resource strain, socioeconomic factors, and disability stigma) and level of parental concern surrounding developmental progress (based on prior family history and parental developmental knowledge).

The theme "screening tool results," included severity of result, and reliability in time-constrained/chaotic clinic settings, accuracy of parental inputs, and trialability of specific screener items. When these three themes were in alignment, the decision to refer was reported to be straightforward. When they were in conflict the decision to refer was more likely to be subject to providers' individual judgement.

Conclusions: Decisions to refer to EI services are complex, involving a balance between provider observations, parental contexts, and screening tool results. Understanding these complexities may raise awareness of barriers to referral and improve early referral practices.



420.150 Using Mobile Technology to Assess Age and Sex Differences in a Phenotypic Measure of Autism in a Large Cohort of Children from India and Malawi

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Background: Reduced social attention is a well-established early feature of autism spectrum conditions (ASC) (Hedger et al., 2020). From birth, humans exhibit a preference for attending to social stimuli (e.g. faces). This attentional bias is a foundation for cognitive, social, and emotional development (Dubey et al., 2022; Portugal et al., 2024; Simion et al., 2015), and exists on a continuum throughout the general population, autistic individuals being over-represented in one tail of this distribution (Pierce et al., 2015; Frank et al., 2014). However, few studies have examined social attention in large, diverse populations across the entire early developmental period (0-6 years), with most data coming from European and North American samples.

Objectives: The STREAM project (Williams et al., 2024) has developed an open-source, scalable tablet-based app that can be administered by non-specialist workers to assess neurodevelopment in children using task-based measures of social, attentional, cognitive, and motor function. The present analysis uses a subset of data from the STREAM project, and explores the population distribution of social attention across early childhood in two large samples in India and Malawi.

Methods: N=3903 (India: n=1924; Malawi: n=1979; 49.5% female) children aged 0-6 years completed a preferential looking task administered using a tablet device. The task comprised 12 trials featuring side-by-side presentations of brief (4s) social and non-social videos (Dubey et al., 2023). Children passively watched the videos while their faces were recorded using the tablet's front-facing camera. The duration spent looking at the social and non-social stimuli was measured using a gaze classification technique (Chitnis et al., 2024), with social preference defined as the proportion of time spent looking at the social relative to the non-social stimuli.

Results: A Generalised Additive Model for Location, Scale, and Shape (GAMLSS) revealed a complex nonlinear relationship between social preference and age. Age-adjusted social preference scores were analysed via linear regression. Social preference was low in younger children, increased between 1-2.5 years, then plateaued until age 6. Girls demonstrated higher social preference than boys ($\beta = -0.16, p = 0.008$), with this difference widening between 1-2.5 years (8.6%), and stabilising at around 13.4% between 3.5-6 years (Figure 1). While social preference increased with age ($\beta < 0.001, p < 0.001$), this increase was significantly more pronounced in girls ($\beta < -0.001, p < 0.001$). These patterns were similar across cultures.

Conclusions: This study presents evidence for emerging social attentional bias in children across early development, in likely the largest sample to date. It highlights generalisable developmental patterns across two understudied cultures and reveals stable sex differences. These findings underscore the need to consider age- and sex-related variability to improve the sensitivity of this measure of social preference, building on similar paradigms used to identify autistic toddlers in USA (Moore et al., 2018; Pierce et al., 2016).



420.151 fNIRS As an Imaging Modality in Toddlers with Neurodevelopmental Conditions: A Feasibility Study

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Background: Brain imaging studies using fMRI report promising results on the brain-behavior relationship in attention processing in autism (AUT) and other neurodevelopmental conditions (NDC). While task-based fMRI is effective in understanding the neural bases of behavior in older children, it is less feasible in young children. Functional near-infrared spectroscopy (fNIRS) demonstrates great promise, granting the ability to study brain activation patterns in young populations while awake and engaging in various tasks. While prior studies demonstrate success in utilizing fNIRS with infants and preschoolers with autism (Lloyd-Fox et al., 2013; Scaife et al., 2023), few studies have examined feasibility of implementing fNIRS with neurodiverse populations during toddlerhood, a period of rapid development and the earliest time when autism can be reliably diagnosed.

Objectives: 1) Present a toolbox of behavior and attention management strategies that can be implemented in fNIRS studies with neurodiverse toddlers; and 2) Evaluate the feasibility of signal acquisition and processing in neurodiverse toddlers.

Methods: Participants included 105 toddlers; 18 with AUT, 37 with NDC (e.g. language, motor delays), and 50 typically developing (TD) toddlers. Cortical activity was recorded using the NIRx NIRSport2 system as participants viewed a series of 8-second videos of an actress in which the presence of gaze and speech was manipulated. Our behavior and attention management toolbox includes a variety of tactics strategically implemented with toddlers, including child-friendly cartoons, attention getters, brief movie breaks, and experimenter guidance as needed to maintain and/or recapture participants' attention. Data were preprocessed with an in-house pipeline combining python-based MNE-fNIRS packages, a MATLAB-based global signal removal tool, R, as well as the channel-to-ROI specificity thresholds of the devFOLD toolbox for region of interest (ROI). Feasibility measures included participant retention rates after excluding participants (i) who refused to wear the fNIRS headgear (capping); (ii) whose data did not meet minimum attention requirements (>3 trials in at least 1 condition, due to fussiness or inattention); and (iii) who had poor data QC: <70% of optodes from the superior temporal gyrus (STG) regions with a scalp coupling index (SCI) threshold of 0.5.

Results: Amongst the 105 toddlers recruited for this study, 65 participants were included after the 3 stages of pre-processing: capping, attention, and data QC (Figure 1) leading to a retention rate of 65% of toddlers with and without autism. There was a high success rate with capping participants (AUT=78% (n=14); NDC=76% (n=28); TYP=84% (n=42)). Of these toddlers, many showed excellent attention to the screen (AUT=86% (n=12), NDC=68% (n=19), TD=93% (n=39)). Finally, the majority of those remaining contributed high-quality data (>70% of optodes from STG) (AUT=92% (n=11), NDC=89% (n=17), TD=95% (n=37)).

Conclusions: Participant loss due to capping, inattention and data quality was relatively low (35% attrition rate) in our study with neurodiverse toddlers. With retention rates comparable to previous studies of typically developing toddlers (30-55% attrition rate; Chiara et al., 2019; Hakuno et al., 2018), the current study establishes high feasibility of implementing fNIRS protocols with neurodiverse toddlers when utilizing a toolbox of behavior and attention management strategies.



420.152 Gut Microbiome Dysbiosis and Metagenomic Kynurenine Pathway Enrichment in Early Autism Spectrum Disorder
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Background: Preclinical research implicate a causal role for the microbiome in the development of autism through the microbiome-gut-brain axis. Clinical trials demonstrate improvement in autism symptoms after microbiome transplant from neurotypical donors. However, the development of the autism microbiome which underlie these findings remains poorly understood—with most studies conducted beyond critical periods of neurodevelopment.

Objectives: To determine the gut microbiome taxonomic composition and metagenome in early diagnosis of autism, and to test whether gut microbiome composition can predict autism diagnosis.

Methods: 83 subjects (20 typically developing, 63 autism; mean age 26 months; 65% male) completed neuropsychological testing, subphenotyping with eye tracking, and shotgun metagenomic sequencing of stool microbiome. Microbiome group differences were tested with a Bayesian inferential regression modeling computational framework (BIRDMAN). Machine learning via q2-sample-classifier tested if microbial taxonomic and functional profiles could predict diagnostic category.

Results: The autism group had significantly (credible interval exclusively negative or positive values) increased facultative anaerobic pathogens (Klebsiella, Enterococcus species) and decreased commensal obligate anaerobes (Prevotella, Dialister species). The low social/language attention eye tracking subgroup had a unique taxonomic profile with reduced Desulfovibrio desulfuricans. The autism microbial metagenome had significantly increased pathogenicity, antimicrobial resistance, and kynurenine metabolism genes favoring shunting toward neurotoxic product, quinolinic acid. Machine learning on metagenomic and KEGG orthology profiles predicted autism membership with AUC of 0.88 and 0.92, respectively.

Conclusions: This study provides novel microbiome metagenomic signatures of autism in the youngest prospective cohort to date. Findings support the need for future work to determine whether the gut microbiome can predict autism prior to neuroclinical diagnosis, and whether manipulation of the microbiome early in development is a therapeutic target in autism.

420.153 Development of the Core Characteristics of Autism: An Eye Tracking Study

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Background: Autism has been proposed to be a developmental response based on genetic variance interacting with environmental stimuli that manifests as a result of the child acquiring atypical learning experiences over time (Jones & Klin, 2013). The social domain is the primary area where the consequences of these learning experiences are manifested in autism (e.g., Constantino et al., 2017; Klin et al., 2015). If this process of accruing differences is accurate, then young children who have atypical learning experiences (e.g., not attending to age-appropriate social information) will first display differences that are most closely linked with the particular information that is missed. Core areas of identified difference have included eye contact (Zweigenbaum et al., 2015), gaze integration, and joint attention (Franchini et al., 2017).

Objectives: This study uses eye tracking to longitudinally predict specific areas of social difference. We hypothesized that differences in visual attention mechanistically lead to social differences, which results in observed behaviors that are at the core of autistic characteristics early in development. Eye tracking should predict the core areas of differences better than those areas that are more distal characteristics, as measured by clinician ratings on the Autism Diagnostic Observation Schedule (ADOS).

Methods: This dataset was accessed through the NIMH National Data Archive, from Volkmar & colleagues, (2007) ; there were 69 children identified as having a high risk (HR) and 32 children who were at a low risk (LR) of developing autism, tested at two time points: Time 1 mean age = 20.47 months, and Time 2 = 28.16 months. At Time 1, participants watched short videos clips of a woman performing a naturalistic caregiver interaction. Eye movements were tracked and areas of interest were identified to capture looking times in the following areas: mouth, eyes, the woman's body, or the background in the image. Participants were assessed using the ADOS at Time 1 and Time 2.

Results: The LR group spent a significantly higher proportion of their time looking at the woman's eyes, ($p = 0.004$) than the HR group, and vice-versa for the background, ($p = 0.001$). Eye-tracking was a significant predictor of ratings on the ADOS for eye contact at time 2 ($p = 0.036$), as well as gaze integration at both times ($p = 0.024$ and 0.013), and response to joint attention ($p = 0.002$ and 0.027). Eye-tracking was not generally a significant predictor of distal characteristics (e.g., imaginative play, gesture use, and giving).

Conclusions: Eye tracking in this task reflects attention to social stimuli, and different attentional patterns to informative social areas likely leads to a compounding of atypical learning experiences that lead, in turn, to some of the core differences seen in autism. Secondly, the findings suggest that the core differences in autism emerge in a manner interconnected with eye tracking, whereas other features of autism (i.e., the distal features) are less directly associated. Interventions that draw attention to socially relevant areas (e.g. eyes), while difficult to implement, may impact on the expression of core areas of autism.

420.154 Early Language Skills Explain Variance in Broad Behavioral Signs Indicating Likelihood of ASD in a Large Sample of Toddlers from the Developing Human Connectome Project (dHCP)

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Background: Studies with neurotypical infants suggest that language development might be contingent on and constrained by early reciprocal social engagement. Atypical language emergence and delays are, indeed, very common in autism spectrum disorder, which is characterized by difficulties with social engagement. However, the extent to which early language skills and social development are linked dimensionally is unclear.

Objectives: The goal of this study was to assess whether expressive and receptive language skills in toddlers are robustly linked to the behavioral signs indicating likelihood of ASD.

Methods: A subset of the large-scale and open-source data from the Developing Human Connectome Project (dHCP) was used in this study. Infants with no history of prenatal and neonatal problems or complications were recruited at St Thomas' Hospital, London (UK) and enrolled in the dHCP cohort. The final sample for the present analysis included 325 toddlers (146 females; *mean age* $\pm$ 19.0 *sd* = 1.8 months, *range* = 17-35 month) who were born at full-term (37 weeks or more). Receptive and expressive language scores for each child were obtained via administration of the Bayley Scales of Infant and Toddler Development, 3rd edition (BSID-III); the Quantitative Checklist for Autism in Toddlers (Q-CHAT) screener was administered to caregivers and will serve as a continuous measure of behaviors indicating likelihood of ASD. Sex differences in Q-CHAT scores were tested with an independent samples t-test. Backward stepwise multiple regression models were run separately for males and females, with all BSID-III scores, including motor and language skills, as well as mother's educational level, mother's and father's ages, and the child's age at testing as predictors and Q-CHAT scores as dependent variable.

Results: Replicating the known sex dimorphism effect, our results revealed that male toddlers had significantly greater Q-CHAT scores compared to female toddlers (*M females* = 29.7; *M males* = 32.2; *t* = 2.59, *p* = 0.01). Results of regression models revealed that early language abilities were ideal predictors of Q-CHAT scores in both male and female toddlers, with lower language skills significantly associated with greater Q-CHAT scores. Namely, in female toddlers, gross motor ($\beta = -0.66$, *p* = 0.04), expressive ($\beta = -0.66$, *p* = 0.02) and receptive ($\beta = -0.76$, *p* = 0.003) language skills, together, explained 26% of the variance in QCHAT scores (*adjusted r*²: 0.26, *p* < 0.001). In male toddlers, expressive ($\beta = -0.97$, *p* < 0.001) and receptive ($\beta = -1.22$, *p* < 0.001) language skills explained 36% of the variance in QCHAT scores (*adjusted r*²: 0.36, *p* < 0.001). Figure 1 illustrates the relationship between language skills and Q-CHAT scores in the entire sample.

Conclusions: These results demonstrate a clear relationship between early language skills –assessed with clinician-administered developmental measures – and broad behavioral signs considered to be indicative of ASD likelihood (reported by caregivers) in a large population-based cohort of toddlers. Although the average Q-CHAT scores were below the clinical cut-off (<39) in this cohort, children who scored above the cut-off on this autism screener had lower expressive and receptive language skills.



Poster Session

421 - High Support Needs or Profound Autism I

May 2nd, 2025, 12:30 PM - 1:30 PM - Hall 4A

421.155 The Relationship between Cognitive Abilities and Progress in Knowledge Acquisition and Functional Skills Among Autistic Adults with High Support Needs

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Background:

Our previous research has demonstrated the efficacy of the Teaching Model (TM), an innovative intervention implemented in classroom settings for autistic adults with high support needs (HSN). The program promotes knowledge acquisition and functional skills enhancement. This study aims to examine the relationship between cognitive abilities and the outcomes of the TM intervention.

Objectives:

1. To evaluate the relationship between nonverbal and verbal cognitive abilities and the acquisition of new knowledge following the TM intervention among autistic adults with HSN.
2. To assess the relationship between nonverbal and verbal cognitive abilities and the enhancement of functional skills.

Methods:

The study included 70 participants (21 females), aged 23 to 57.6 years ($M=33.89/SD=8.49$), all previously diagnosed with autism, residing in sheltered frameworks for autistic adults with HSN, and received the TM intervention. Adaptive skills were assessed using the Vineland Adaptive Behavior Scales, and autism trait intensity was measured using the Social Responsiveness Scale. Cognitive assessments included the Test of Nonverbal Intelligence (TONI) for nonverbal reasoning ability and the Peabody Picture Vocabulary Test (PPVT-5) for language comprehension. The TM courses covered various topics, while integrating functional skills training. Knowledge acquisition was measured through course-specific assessments, while functional skills enhancement was evaluated across domains of social-communication, adaptive behaviors, and classroom-related independent skills. Data were collected at pre (T1) and post-intervention (T2) times.

Results:

Based on the median scores for the TONI and PPVT, participants were divided into high and low score groups. For knowledge acquisition, a 2x2 ANOVA for the TONI revealed a significant main effect for time ($p=.04$) and a significant time x group interaction ($p=.01$). Both TONI groups showed significant improvement from T1 to T2 ($p<.001$), with the low score group exhibiting a more pronounced effect. A similar analysis for the PPVT demonstrated significant main effects for time ($p=.03$) and group ($p=.001$), with a significant time x group interaction ($p=.01$). Both PPVT groups also showed significant improvements ($p<.001$), with the low score group exhibiting a more pronounced effect. Functional skills improved over time ($p<.001$) without significant differences between TONI or PPVT groups. Hierarchical linear regression analyses for predictors of knowledge acquisition were non-significant. However, regression analyses for skills assessment yielded significant results only in the social-communication domain. The model explained 72% of the variance in T2 social-communication scores, with T1 social-communication scores as the strongest predictor ($\beta=.82$, $p<.001$), while PPVT scores also made a significant contribution ($\beta=.31$, $p=.004$).

Conclusions:

Regardless of nonverbal or verbal cognitive abilities, participants improved in knowledge and functional skills following the TM courses. Notably, participants with lower TONI and PPVT scores showed the most significant gains in knowledge acquisition. Improvements in functional skills were observed across the entire cohort, independent of cognitive abilities. Additionally, verbal cognitive ability, as measured by PPVT scores, emerged as a significant predictor of enhanced social communication skills, underscoring its role in social skills acquisition. These findings highlight the potential for meaningful learning among autistic adults with HSN, especially for those with more pronounced cognitive impairments.

421.156 AI-Based Analysis and Classification of Communicative Nonverbal Vocalizations of Non- and Minimally-Speaking Individuals

S. B. Shah¹ and **K. T. Johnson²**, (1)Department of Electrical and Computer Engineering, Northeastern University, Boston, MA, (2)Northeastern University, Cambridge, MA

Background: Non- and minimally-speaking individuals with profound autism use nonverbal vocalizations like cries, grunts, and hums to express communicative functions like emotions, requests, and rejection. These vocalizations are readily understood by the individuals' caregivers but are often misinterpreted by unfamiliar individuals and standard speech-processing systems, necessitating caregiver input to accurately annotate these samples. The Rapid Online Sample of Communication (ROSCO) data collection protocol captures communicative acts from these individuals in naturalistic settings and labels them through input from their caregivers. This data can help train machine learning (ML) models to enable real-time vocalization classification in the absence of caregivers.

Objectives: This study aims to use an ML model to classify the communicative functions of nonverbal vocalizations from non- and minimally-speaking individuals. The ultimate goal of this work is to aid the development of automated augmentative technologies that can respond organically to the unique vocalizations of this population.

Methods: We analyze 25 ROSCO sessions from 21 non- and minimally-speaking individuals (age=2-12 years) with Phelan McDermid Syndrome (n=17), Tuberous Sclerosis Complex (n=3), and PTEN Hamartoma Tumor Syndrome (n=1). Vocalizations constituted 29% of observed communicative expressions, producing a dataset of 591 vocalizations across 6 communicative functions (Emotions:37% of all samples, Self-Directed Behaviors:18%, Requests:18%, Comments:12%, Rejections:11%, Social Interactions:4%). The vocalizations were augmented through noise addition, pitch-shifting, time-shifting, and time-stretching to increase sample diversity. These samples are converted into mel-spectrograms with 128 mel bands using the librosa library in Python. The Vision Transformer model is used to learn the spatial relationships within these mel-spectrograms and convert them into latent representations (dim=24). A mean vector for each class in the dataset is calculated from these latent representations for analysis and comparison. Cosine similarity is used as a quantitative metric to measure the similarity between these mean vectors.

Results: The dataset's small size combined with the significant class imbalance (Imbalance Factor=8.69) leads to relatively subpar classification performance (Acc=28.39; F1=26.34). Sample augmentation substantially improves performance (Acc=49.41; F1=43.43), indicating a lack of sample size and diversity for different classes. Request was the most globally similar function (Avg. CS=0.965), indicating a mix of affective and communicative signals within this function, while the expression of various emotions was the most globally dissimilar (Avg. CS=0.930), possibly because its larger sample size and range of affective expressions led to distinctions in the latent space. Existing speaker diarization models failed to distinguish nonverbal vocalizations from sounds produced by caregivers or augmentative and alternative communication (AAC) systems, limiting the utility of this type of data.

Conclusions: While traditional ML models are poor at processing nonverbal vocalizations from non- and minimally-speaking individuals, this study lays the groundwork for new models that can classify the sounds from small, heterogeneous samples. Future work will create novel ML algorithms to improve classification accuracy for this underrepresented data, which may be applicable as objective outcome measures for clinical interventions designed for these individuals. This research also aims to foster the development of vocalization-activated augmentative technology that increases interactions and understanding between non-speaking individuals and the general public.



421.157 Access to Augmentative and Alternative Communication Among Families of Minimally Verbal Children with Autism Spectrum Disorder

M. Hare, S. Jeste, E. McFadd and C. DiStefano, Children's Hospital Los Angeles, Los Angeles, CA

Background:

Approximately 30% of individuals with autism spectrum disorder are minimally verbal, meaning they have little to no spoken language (Tager-Flusberg & Kasari, 2013). Augmentative and Alternative Communication (AAC) refers to a variety of methods that help these individuals communicate. AAC has been shown to increase a minimally verbal individuals' capacity to communicate and promote further spoken language (DiStefano et al., 2016). However, families often report challenges accessing the devices. Past research has shown that children with autism, whose parents' primary language is not English have fewer services hours per week and are less likely to have communication skills goals listed on their individual education plans (St. Amant et al., 2018).

Objectives:

To investigate if home language is associated with AAC access. We hypothesize that families who speak a language other than English at home will report lower rates of AAC access than English-only speaking families

Methods:

A survey was sent to the families of 4,314 patients in the CHLA health system with a diagnosis of autism aged 3-18. The survey asked about access, use, and barriers to AAC and was available in English and Spanish. 475 families responded to the survey; 106 families reported their child as minimally verbal continuing onto the full survey. Access to AAC was compared using a chi-square test.

Results:

Responses were compared between families who reported speaking a non-English language at home (primary or secondary) (N=57), and families who only spoke English at home (N=39). There was a significant relationship between home language and AAC access, $\chi^2(1, N = 96) = 9.86, p < 0.01$. 64% of families in the English only group have had access to AAC, while only 32% of families in the other language group have had access to AAC (see attached figure). 56% of families in the other language group reported that they had limited knowledge of AAC prior to the survey. A two-sample t-test confirmed there was not a significant difference in age of access, $t(41) = 0.25, p = 0.80$.

Conclusions:

The results above suggest that families of minimally verbal children who speak a language other than English at home may have less access to AAC compared to their English-only counterparts, unrelated to age of acquisition. Additionally, most families without access did not have prior knowledge of AAC, meaning that they could not advocate for these devices. This suggests that families who are not introduced to these devices at the same time as their English only counterparts miss out on the intervention altogether. This is significant concern as 55% of families in Los Angeles County speak a language other than English at home (*Los Angeles County, California - Census Bureau Profile*, n.d.). This discrepancy could be a result of language barriers between the families and school and healthcare professionals, which has been found to be a significant challenge when accessing other autism services (Lim et al., 2021). Future research should be aimed at investigating the causes of this discrepancy and improving access to AAC.



421.158 Augmentative and Alternative Communication: Diverse Caregiver Perspectives on Access and Implementation

S. Jacobs, F. Menendez, S. Jeste, E. McFadd and C. DiStefano, Children's Hospital Los Angeles, Los Angeles, CA

Background: Augmentative and alternative (AAC) interventions are effective for increasing communication in children with profound autism and may promote spoken language development (DiStefano et al., 2016; White et al., 2021). However, many individuals do not have access to AAC systems or are not provided with necessary ongoing support. A recent systematic review identified numerous barriers to AAC utilization, including limited access to AAC systems and a paucity of individuals trained to provide intervention (Donato et al., 2018). Little research exists on how demographic factors that are associated with disparities in autism diagnosis and care (e.g. race/ethnicity, primary language, socio-economic status) influence AAC access and use (Pham and Charles, 2023). We sought to understand how caregivers from underrepresented communities perceive the barriers and facilitators they have experienced in obtaining AAC support for their children.

Objectives: Our objective was to identify barriers and facilitators to AAC access and implementation within a diverse group of children with profound autism, via semi-structured interviews with caregivers.

Methods: 12 caregivers were recruited from an outpatient neurogenetics clinic at a large, metropolitan children's hospital serving a highly diverse patient population (40% uninsured, 35% Medicaid-eligible, 65% Latino, 70% non-white). See Table 1 for participant information. Semi-structured interviews were conducted with caregivers to elicit their experiences with initial introduction to AAC, the evaluation process, barriers and facilitators to device acquisition, and ongoing implementation. Interviews were audio-recorded, transcribed and coded for themes using inductive methods (Braun and Clarke, 2006).

Results: Regarding barriers and facilitators to access, several themes emerged (Table 2), with two predominating: (1) the role of service providers (primarily speech language pathologists) as either a barrier or facilitator to device acquisition and engagement, and (2) caregiver research and advocacy. 92% of caregivers discussed school-based providers and half discussed private providers. 58% of caregivers identified that their child's school providers were a barrier to accessing AAC (e.g. did not feel that the child was ready), while 42% identified them as facilitators (e.g. advocating for AAC system introduction). 83% of caregivers reported self-directed research and advocacy, with half noting guidance from online resources and one third seeking legal representation.

Conclusions: Our sample of caregivers frequently identified school-based personnel as either a barrier or facilitator to AAC device acquisition and implementation. While prior research has identified providers (particularly speech-language pathologists) as instrumental in supporting AAC access, our results suggest that school-based providers may be especially relevant for diverse families. Further research is needed to explore whether this focus on school-based providers is due to lower utilization of private/clinic-based providers, or other factors. Additionally, our data extends existing caregiver engagement research by suggesting that caregivers from underrepresented groups are engaging in high rates of advocacy in order to access AAC. Future steps should (1) consider the perspectives of school personnel and examine school systems to understand differences in approaches and why barriers may be arising and (2) explore what informational outlets caregivers are most accessing to discern their credibility and engage families in discussions regarding evidence-based guidelines of AAC usage.



421.159 Autism-Related Stigma Experienced By Parents of Minimal Speaking and Verbal Autistic Children in India

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Background:

Autism-related stigma (hereon stigma) significantly affects the quality of life (QoL) of autistic children and their parents, particularly those with high support needs, such as minimally speaking autistic children. In India, stigma can limit social supports, a crucial aspect of child-rearing, thereby greatly impacting a family's QoL. However, our understanding of these effects is limited. To develop tailored interventions that can support Indian autistic children and their parents, it's essential to explore and understand the nature and impact of this stigma on QoL.

Objectives:

To qualitatively explore parents' experiences with stigma and its impact on QoL in parents of minimally speaking and verbal autistic children in India.

Methods:

Parents of autistic children (N = 10) completed semi-structured interviews (140-180 minutes) focusing on understanding parents' experience of parenting an autistic child in India. Data from the interviews were systematically coded and analyzed using applied thematic analysis stratified by parents' reported child communication abilities (minimally speaking and verbal). Results specific to experiences with stigma are presented in this presentation.

Results:

Three themes were identified. First, all parents reported facing stigma from family, friends, and others. They were blamed and judged for their child's condition, attributed autism to parents' "bad karma." The child was treated as "untouchable," and socially ignored and neglected. Second, factors related to the child (e.g., support needs), the parent (e.g., education, quality of marital relationship), and the context (e.g., stigma from family vs. strangers) influence how parents respond to stigma. For example, parents who experienced stigma from close family and friends identified their children as minimally speaking, even though nine out of the ten children were minimally speaking based on clinical judgment. Third, the combined effect of stigma and parental responses had social, emotional, and health (biopsychosocial) consequences for both parents and their child. For example, parents described loneliness, strained marital relationships, decreased opportunities for respite, and negative effects on their health and parent-child relationships. Stigma from close relations was more pervasive and impactful, leading to greater biopsychosocial consequences that significantly affected child development and wellbeing.

Conclusions:

Autistic children and their parents faced pervasive stigma, which manifested as blame towards parents and derogatory treatment of children, greatly affecting family dynamics and parents' social lives. The consequences were intensified when stigma came from close relations, leaving families without familial support (e.g., respite). This potentially led parents to internalized stigma and lower expectations for their child, which was further affected by a lack of structural supports (e.g., autism awareness, parent training) in India. Parents' prolonged self-reliance with limited social and structural support might have lasting negative effects on parents and, by extension, on child development, highlighting an area for future research. The study underscores the critical role of social support in fostering resilience and mitigating adverse effects of stigma in India. Findings from this study have implications for caregiver experiences in other countries with similar social contexts and indicate a need not only for widespread education about autism but also for deliberate creation of social and structural supports.

421.160 Characterizing IQ-DLS Discrepancies from Ages 2-25 in Autistic Individuals with Co-Occurring Intellectual Disability

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Background: Many autistic individuals exhibit lower daily living skills (DLS) than would be expected based on their intellectual quotient (IQ) (Kanne et al., 2011). There is limited understanding of why this IQ-DLS discrepancy exists (Duncan & Bishop, 2015). Existing work is cross-sectional, has focused on autistic individuals with average or higher IQs, and has not examined discrepancies by subdomain (i.e., DLS specific to personal care, household tasks, and community skills). Autistic individuals with co-occurring ID are often excluded from research, but IQ-DLS discrepancies exist in this subgroup also (Teh et al., 2023).

Objectives: To provide a deeper understanding of the IQ-DLS discrepancy in autistic individuals with ID by exploring trajectories of IQ-DLS discrepancies by DLS subdomain (i.e., personal, domestic, community) from ages 2-25 in a well-characterized longitudinal sample.

Methods: IQ and DLS data were collected from 107 participants with autism and IQ < 70 at ages 2, 3, 5, 9, 14, 18, 21, and 25. IQ was measured via the Mullen at age 2; later assessments were selected from a standardized hierarchy based on participants' developmental abilities. DLS was measured using the Vineland Adaptive Behavior Scales (VABS) and analyzed at the subdomain level (i.e., Personal, Domestic, Community). IQ-DLS discrepancy scores were calculated by subtracting DLS subdomain age equivalents from mental ages derived from cognitive tests. Group-based trajectory analyses were conducted via Stata 17; AIC, BIC, and smallest group percentage were used to determine the best-fitting models.

Results: IQ-DLS discrepancy trajectories varied across DLS subdomains (Figure 1). For the Personal subdomain, a three-group model best fit the data (Figure 1). The first group, Low-Decreasing, was characterized by steeply declining IQ-DLS scores from early childhood into early adulthood; scores slightly increased in participants' mid-twenties. The Mid-Decreasing group was characterized by declining discrepancy scores, and the High-Stable group was characterized by discrepancy scores that changed little with age. A two-group model was the best fit for the Domestic subdomain. These two groups, Low-Decreasing and Mid-Decreasing, showed similar growth patterns to the same-named Personal subdomain trajectory groups (Figure 1). Finally, a one-group model characterized by shallow declines in discrepancy scores best fit the Community subdomain. For the Personal subdomain, African American participants were more likely to be in the Mid-Decreasing trajectory group. Otherwise, descriptive characteristics did not vary between trajectory groups (Table 1).

Conclusions: These results underscore the importance of considering DLS subdomains separately when studying the IQ-DLS discrepancy, as each subdomain showed different patterns of change. For all subdomains, most participants in this sample had IQ and DLS abilities that were commensurate (i.e. discrepancy scores close to zero). However, a small subgroup of individuals showed considerable development of Personal and Domestic DLS, as evidenced by increasingly negative IQ-DLS discrepancy scores. Consistent with other studies, findings suggest ongoing development of DLS through adolescence, but a relative slowing in young adulthood, likely underscoring a need for ongoing opportunities for adults to continue to learn and develop DLS. Follow-up analyses are underway to examine IQ-DLS discrepancy trajectories in autistic individuals with IQ $\geq$ 70.



421.161 Comparing Demographic and Clinical Correlates of Self-Injurious Behaviors of Varying Intensity and Impact in Autism

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Background: Self-injurious behaviors (SIB) vary widely in form and intensity, with some behaviors greatly increasing the likelihood of immediate physical injury or hospitalization. Identifying factors that predict more immediately harmful manifestations of SIB is crucial for providing targeted and effective support. In particular, it has been theorized that distress dysregulation (e.g., distress related to changes in routines), sensory processing differences, lower communication abilities, and lower socio-economic status (SES) are associated with SIB in autism. However, it is unknown whether these features are differentially associated with SIB that may result in accrued injuries due to repetition (SIB-accrued, e.g., hair-twirling) and SIB that may be immediately injurious (SIB-immediate, e.g., head-banging).

Objectives: To explore the relative contributions of distress related to disruptions to routines (i.e., distress dysregulation), sensory symptoms, age, sex, speech level, and SES in the context of two categories of SIB differentiated based on potential for injury, SIB-accrued and SIB-immediate.

Methods: Parents of 1,892 autistic children and adolescents aged 3-19 years (22% females; 12.6% IQ < 70) were recruited through Simons Foundation Powering Autism Research for Knowledge (SPARK) to complete online questionnaires. Measures included the Sensory Experiences Questionnaire (SEQ-3.0), and the SIB and Insistence on Sameness (IS) subscales of the Dimensional Assessment of Restricted and Repetitive Behaviors (DARB). SIB items were divided into two conceptual categories: SIB-accrued and SIB-immediate. Distress dysregulation was assessed using items that captured the child's level of distress linked to endorsed IS items (e.g., Does she/he get upset if this routine is not followed?).

Hierarchical multiple linear regressions were conducted to examine unique predictors of SIB-accrued and SIB-immediate. For each model, age, sex, speech level, and SES were entered in step 1, IS distress in step 2, and sensory hypersensitivity, hyposensitivity, and seeking in step 3.

Results: Overall, the full model accounted for 23.5% of the variance in SIB-accrued, with age ($t = 7.97$), IS distress ($t = 7.07$), sex ($t = 5.19$), hypersensitivity ($t = 4.89$), and sensory-seeking behaviors ($t = 4.77$) demonstrating the strongest associations with SIB-accrued ($F(8,1548) = 59.49$, $p < .001$). Additionally, the full model accounted for 21.7% of the variance in SIB-immediate, with IS distress ($t = 8.75$), sensory-seeking behaviors ($t = 5.90$), household income ($t = -4.88$), speech level ($t = -4.56$), and hypersensitivity ($t = 3.08$) showing the strongest associations with SIB-immediate ($F(8,1548) = 53.65$, $p < .001$).

Conclusions: Findings demonstrate the complexity of SIB and highlight the need to further characterize the heterogeneity in SIB presentations.

Lower speech level may contribute to greater severity of SIB types that result in immediate physical injury or hospitalization, highlighting the importance of assessing SIB at a more granular level to identify autistic subpopulations in need of greater support. Female (sex) was associated with greater severity of SIB-accrued, while sex differences were not observed in the severity of SIB-immediate. Finally, IS-related distress dysregulation, sensory-seeking, and hypersensitivity demonstrated strong associations with both SIB-accrued and SIB-immediate. Findings underscore the importance of identifying factors that predict more immediately harmful manifestations of SIB to inform more targeted prevention and intervention efforts.

421.163 Development of a Person-Centered Coding Framework to Assess Multimodal Communication in Non-Speaking Individuals

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Background:

Non- or minimally-speaking individuals with complex neurodevelopmental disorders (NDDs) often use multimodal communication, including non-speech vocalizations, gestures, body movements, facial expressions, and augmentative technology. Caregivers, familiar with these nuanced behaviors, provide valuable insights that are rarely incorporated into standardized assessments. As a result, traditional tools often fail to capture the full range of communication, leading to low assessment scores and hindering accurate characterization, progress monitoring, and the development of reliable outcome measures.

Objectives:

This project identifies and defines patterns of communication identified by caregivers but often missed by traditional assessments, creating a coding framework that clinicians can apply to capture the full range of communicative behaviors in non-speaking individuals with complex NDDs.

Methods:

Participants in the study completed a new remotely administered natural communication sampling paradigm called ROSCO (Rapid Online Samples of Communication) which consists of semi-structured developmentally appropriate activities with a caregiver administered via a video platform such as Zoom. A follow-up Post-ROSCO Interview is completed remotely between the caregiver and the researcher after completion of the ROSCO session. After reading a script of instructions, the examiner conducts the interview, pausing the recorded ROSCO session every 10 seconds. At each pause, parents indicate whether their child attempted to communicate or "send a message" during that time. They describe the behaviors used to convey the message, such as vocalizations, gestures, facial expressions, or body movements, and identify the communicative function (e.g., requesting, rejecting, commenting, or expressing emotion). Importantly, the instructions provided and interview process do not provide constraints on the behaviors or functions that caregivers can identify. Caregivers then rate their confidence in whether the behavior was intended as communication using a 5-point Likert scale. Participant descriptives are presented in Table 1.

Results:

In our pilot data, caregivers have described behaviors not typically included in early communication frameworks such as repetitive shirt rubbing, idiosyncratic mouth opening, or inaction as a form of communication. They rate behaviors as communicative that would not meet traditional definitions of directness (e.g., lacking coordination of gaze or other communicative behavior) as clearly intended for the caregiver, often with a high level of confidence. Additionally, caregivers have described that these behaviors often carried nuanced communicative functions beyond the traditional categories (e.g., behavior regulation, joint attention) such as self-stimulation or self-soothing. We are currently analyzing these patterns using formal analysis and clinical judgment to refine communication categories with precise terminology. Parent confidence ratings will guide this process, with lower-confidence behaviors reconsidered to ensure clear categorization.

Conclusions:

The initial findings highlight the need for a strength-based, person-centered approach to capturing the use of multimodal communication in non-speaking individuals with NDDs. By integrating caregivers' unique perspectives and allowing them to identify and describe their child's nuanced communication strategies, ROSCO bridges gaps in traditional assessments. This framework offers a promising new way to characterize multimodal communication that clinicians can implement as a first step towards better characterization, progress monitoring, and the development of reliable outcome measures for this population.



421.165 Examining Self-Injurious Behavior Severity and the Dysregulation Profile in Young Autistic Children

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Background: Self-injurious behaviors (SIB) represent a significant area of concern and challenge for many autistic individuals. Up to 50% of autistic individuals engage in SIB at some point in their lives. Some evidence demonstrates links between SIBs and limited expressive language, lower cognitive abilities, higher rates of anxiety, elevated autism severity scores, and increased aggression. Dysregulation of emotional and physiological responses have also been widely implicated in the onset and persistence of SIB in neurotypical individuals and may be an important component to better understand severity of SIB in autistic children in early development.

Objectives: 1) To establish SIB severity as a way to measure the impact of SIB in autistic individuals. 2) to examine the contribution of dysregulation to SIB severity among autistic children between 2-4 years of age.

Methods: In this study, we analyzed SIBs among 320 (n = 213/107 (m/f); *mage* = 3.1 years, *sd* = 6.1 months) autistic children. Diagnoses were confirmed using the Autism Diagnostic Observation Schedule 2nd Edition (ADOS-2) and Autism Diagnostic Interview – Revised (ADI-R) administered by licensed clinical psychologists. Developmental level was assessed using the Mullen Scales of Early Learning (MSEL). SIB was assessed using the Repetitive Behaviors Scale-Revised (RBS-R) in which parents rate the severity of 8 SIBs on a 0-3 point likert scale, 3 indicating the behavior is a severe problem. We subdivided the cohort into four severity groupings of SIB based on their highest rating for any SIB. We then assessed dysregulation by averaging scores from CBCL subscales of attention, anxious/depressed, and aggressive behavior.

Results: Subgrouping by severity level of SIB resulted in 27% of participants in the no endorsement group (n = 87, 56 male/31 female), 35% in the mild group (n = 111, 71 male/40 female), 25% in the moderate group (n = 80, 54 male/26 female), and 13% in the severe group (n = 42, 32 male/10 female). An ANCOVA controlling for DQ revealed that the dysregulation profile score differed between SIB groups. Higher levels of dysregulation were observed in the groups with more severe SIBs $F(3,296) = 19.660, p < 0.001$. DQ was not a significant predictor in the model ($F(1,296) = 2.965, p = 0.09$). Tukey HSD post-hoc analyses indicated significant differences in dysregulation between the severe endorsement group ($M = 66.36$) and each of the other groups: no endorsement ($m = 56.81; p < 0.001$); mild ($m = 59.42; p < 0.001$), and moderate ($m = 62.21; p = 0.01$). In addition, the moderate group had significantly higher dysregulation scores compared to the no endorsement group ($p < 0.001$), and relatively higher dysregulation compared to the mild group ($p = 0.042$).

Conclusions: The present study offers an innovative approach to measure the severity of SIB which may better characterize overall impairment/impact of SIB compared to other scoring methods. We found that dysregulation was associated with increasing SIB severity above and beyond the contribution of developmental level. These findings indicate that dysregulation is an important predictor of SIB severity in very young autistic children, providing a potential target for early intervention.

421.167 Exploratory Comparison of Caregiver Report and Clinical Communication Coding for Non-Speaking Individuals with Profound Autism

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Background: Individuals with profound autism often have complex communication profiles, utilizing multiple modes of communication. The Communication and Symbolic Behavior Scales (CSBS) quantifies communication using a developmental framework for early communicative skills; however, complex communication profiles may not be fully captured by this or similar clinically validated measures. Caregiver input can be a valuable tool in understanding less conventional, highly idiosyncratic communication. The Rapid Online Sample of Communication (ROSCO) paradigm is a new natural communication sampling protocol involving 15 minutes of in-home semi-structured caregiver-child interactions, remotely recorded over Zoom. Then, a researcher conducts a structured interview with the caregiver while rewatching the recorded ROSCO session together. Caregivers label communicative actions and provide a confidence rating (CR) on a 5-point Likert scale, with 1 indicating full confidence the act was communicative or meant to "send a message" to them, and 5 indicating it was self-directed.

Objectives: This exploratory analysis compared communicative acts described by caregivers to those captured by the existing CSBS coding framework.

Methods: Caregiver interviews were transcribed and time-synchronized to ROSCO video sessions using ELAN (n=3; 5-9y; 2M:1F), creating a coded dataset of communicative actions, functions, and caregiver confidence ratings. Participants displayed a range of communication skills, from traditionally recognized communication behaviors, to more nuanced communicative methods such as eye gaze and body movement. These videos were also coded by a trained administrator, who was blind to the caregiver interview, using the established CSBS framework. The outputs from the caregiver-informed and blind CSBS coding methods were compared manually. Results were categorized as "Congruent" when caregiver labels matched CSBS outputs and "Incongruent" when they disagreed. CRs of 4 or 5 were excluded. Counts and percentages of "incongruent" and "congruent" labels with CRs of 1-3 were calculated for the overall group.

Results: We found 70 "congruent" and 111 "incongruent" communicative behaviors from this preliminary sample (see figure). 90% of congruent behaviors were ones that caregivers had rated as being communicative with high confidence (CR=1 or 2), while 10% of the agreements had a neutral CR of 3. Surprisingly, 73% of behaviors identified as communicative by caregivers but not coded by the CSBS framework had a CR of 1 or 2; 27% had a CR of 3. Overall, caregivers described 61% more communicative acts than the CSBS.

Conclusions: While CSBS codes were congruent with caregiver reports 90% of the time, 61% of caregiver-identified communicative behaviors were not accounted for in the existing framework. Communication involving gestures, vocalizations, and touching were generally congruent between caregivers and the CSBS framework. However, caregivers often identified eye-gaze and AAC usage alone as communicative behaviors whereas the CSBS requires a paired action to be considered a communicative act. Emotional expressions and other subtle actions that elicit caregiver response are also not generally recognized as communicative in traditional frameworks. Future work will expand this preliminary analysis to a larger collected sample of 33 ROSCO sessions, and will work towards new communication coding frameworks that capture more nuanced and representative forms of communication using person-centered methods.

**421.168** Facing Your Fears in Autistic Adolescents with Intellectual Disability and Anxiety: A Randomized Controlled Trial

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Background: Autistic teens with intellectual developmental disability (IDD) often experience clinically interfering anxiety (Winch et al., 2022), reduced access to evidence-based mental health care, and significant health inequality (Doherty et al., 2020). Facing Your Fears (FYF), a manualized 14-week group Cognitive Behavior Therapy (CBT) intervention for anxiety in autistic youth (Reaven et al. 2011), was adapted for autistic teens with ID (FYF:IDD); results of a pilot study were promising (Blakeley-Smith et al., 2021). The present study is a more rigorous, randomized controlled trial (RCT) examining the efficacy of FYF:IDD relative to Treatment as Usual (TAU) for anxiety reduction and change in mood/emotion regulation and behavioral difficulties.

Objectives: To conduct an RCT with autistic teens with IDD and anxiety and examine: 1) anxiety reduction (primary outcome), and 2) mood, emotion regulation, and behavioral difficulties (secondary outcomes).

Methods: Seventy-three autistic teens with IDD participated in the study (72.6% male; 26% Hispanic, 72.6% white; ages 12-18 (M=15.3)). Teens were randomized to either FYF:IDD or TAU. Participants were above the autism spectrum cutoff on the ADOS-2 (Lord et al., 2012), had IQ and adaptive behavior in the ID range (FSIQ = 56.2, Adaptive Behavior Composite = 59.4), and met criteria for at least one anxiety diagnosis on the Anxiety Diagnostic Interview Schedule-Autism Addendum (ADIS-ASA, Kerns et al., 2017). Clinicians masked to condition completed Clinical Global Impression Scale-Improvement (CGI-I; Guy, 1976) ratings on the ADIS-ASA for Primary Anxiety diagnosis (i.e., diagnosis with the highest clinical severity rating at baseline), Total Anxiety (i.e., all anxiety diagnoses except specific phobias); and Specific Phobia (i.e., all phobias). Parents also completed the Anxiety Depression and Mood Scale (ADAMS, Esbensen et al., 2003), Emotion Dysregulation Inventory (EDI; Mazefsky et al., 2018), and Aberrant Behavior Checklist-Community (ABC-C, Aman, 2012). There were no pre-treatment differences in IQ, adaptive behavior, age, autism severity and anxiety symptoms. T-tests were used for primary treatment outcomes and mixed-model analyses for secondary treatment outcomes.

Results: (1) Primary treatment outcome: Teens randomized to FYF:IDD experienced significant improvement in their Primary Anxiety CGI rating relative to teens randomized to TAU ($p=.008$). There were no significant differences between groups on Total Anxiety CGI or Specific Phobia CGI. (2) Secondary Treatment outcome: Results indicated significant Group x Time interactions for ADAMS subscales: Manic-Hyperactivity ($p=.013$) and General Anxiety ($p<.045$); ABC-C Subscales: Irritability ($p=.001$), Lethargy ($p=.024$), and Hyperactivity ($p=.026$); and EDI Subscales: Dysphoria ($p=.006$) and Reactivity ($p<.003$).

Conclusions: This is the first RCT of a group CBT anxiety intervention for autistic teens with IDD. Results indicate that teens may benefit from adapted CBT approaches for interfering anxiety and that the impact of FYF:IDD may extend beyond anxiety reduction alone to include mood, regulation, and behavioral changes. This is notable given the unique impact of emotion dysregulation and behavioral difficulties on access to care for this population. The study is a critical step toward establishing an evidence base for adapted CBT treatment for autistic teens with IDD.

Limitations include parent report for outcomes. Future directions will be discussed.

421.169 Feasibility of Dyadic Physiological Research in Minimally Verbal/Nonspeaking Autistic Adolescents and Adults

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Background: Heart rate and heart rate variability are often used with non-autistic and speaking autistic individuals to gain insights into emotional, motivational, and attentional processes (Appelhans & Lueken, 2005; Dijkhuis et al., 2019). Dyadic physiological research has become increasingly common over the last decade (Thorson et al., 2018), enabling the study of interpersonal processes like co-regulation and stress contagion (Dimitroff et al., 2017; Li & Lunkenheimer, 2024).

Like non-autistic people, minimally verbal/nonspeaking (MV/NS) autistic people often interact with social partners, in part due to their need for support. However, the limited physiological research with this group has focused solely on the *individual's* physiological signals (e.g., Goodwin et al., 2019).

Objectives: 1) Develop and evaluate a method for collecting electrocardiogram (ECG) data from MV/NS autistic adolescents and adults using a wireless heart sensor. 2) Assess the feasibility of a one-hour study requiring task engagement in different social contexts.

Methods: We aim to collect ECG data using MC10 BioStamp nPoint sensors from 30 autistic people (ages 15+) with phrase speech or less. In one month, 11 autistic/parent dyads have participated, and 25 additional families have contacted us.

Participants are introduced to the sensor and study via videos and modeling. ECG data are recorded during a 6-minute baseline and as the MV/NS autistic participants play an iPad game alone, with their parent, and with a stranger. ECG data are also recorded from the parent and the stranger.

Results: Of the 11 MV/NS autistic participants tested so far, 10 wore the sensor for the full hour. All 11 parents and 11 strangers wore the sensors. Mindware Technologies' Heart Rate Variability software was used for R-peak detection and trained researchers corrected artifacts. In line with prior work, data segments requiring more than 5% correction are excluded (Lu et al., 2023).

Autistic participants each provided 24 one-minute segments of ECG data. After cleaning, 92.5% (222/240 segments) of the data were usable. The parent and stranger participants each provided 12 one-minute segments. After cleaning, 90.9% (120/132 segments) of the parent data and 100% of the stranger data were usable.

To assess the availability of data for dyadic analyses, we examined the number of usable segments for both dyad members. For autistic/parent dyads, 78.3% of the common segments were usable; 88.3% were usable for autistic/stranger dyads. This exceeds the amount of usable data reported in published studies with non-autistic dyads (e.g., 47.2%; Li et al., 2021).

Conclusions: This study demonstrates the feasibility of dyadic physiological research with MV/NS autistic individuals. With careful attention to sensor choice, preparation, baseline stimuli, and task design, the majority of participants provided usable data. Our data so far meet or exceed the tolerance and usability reported in previous studies using wearable sensors with this population (Imbiriba et al., 2023). Importantly, this work extends prior research in naturalistic settings by showing that MV/NS autistic participants can engage in structured, dyadic experimental tasks. These findings provide a foundation for future research into interpersonal processes, including physiological synchrony, in MV/NS autistic individuals and their social partners.

421.170 High Support Need Groups Among Autistic Children and Youth in the U.S.: Prevalence, Overlap, and Specific Support Needs

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Background: Identifying and supporting autistic youth with high support needs (HSN) is critical for developing assessments and implementing needed policies and programs for service delivery. Previously utilized approaches using administrative and health data are limited to intellectual or spoken language criteria and may miss autistic youth with other high support needs.

Objectives: Using U.S. nationally representative survey data we identified four HSN groups based on prior research and existing focus of policies and service delivery in the general child population: moderate-to-severe intellectual disability or speech disorder; medical complexity; social support needs; and serious mental illness. We aimed to determine 1) the sociodemographic characteristics of autistic youth belonging to each group; 2) overlap across HSN groups; and 3) associations between HSN groups and specific high support needs across family, healthcare, and service domains.

Methods: We combined four years of cross-sectional data from the National Survey of Children's Health (NSCH; 2019-2022), selecting youth aged 2-17 with a parent-reported autism diagnosis ($n = 5,230$). All measures were based on parent-reported questionnaire items. Respondents described mental health and intellectual/developmental disability diagnoses as mild, moderate, or severe. We defined the four HSN groups as follows: 1) moderate or severe intellectual disability or speech disorder diagnoses; 2) medical complexity using previously published methods; 3) social support need: household financial, food, or housing insecurity; and 4) serious mental illness: severe anxiety, depression, or behavioral diagnoses. We measured six specific support needs: 1) unmet service or healthcare needs; 2) negative healthcare provider interactions; 3) missed days of school (ages >5 years); 4) caretaker needs: time spent arranging healthcare or providing home care, reducing employment because of child's care needs, and self-reported challenges caring for the child; 5) peer relationship needs: difficulty making friends, or frequent bullying (ages <5 years); and 6) childhood adversity: ≥ 3 adverse childhood experiences (e.g., parent/guardian divorce; racial discrimination). We used regression models to determine associations between HSN groups (mutually adjusted and count) and specific support needs, adjusting for age.

Results: The prevalence of moderate-to-severe intellectual disability or speech disorder (ID/SD) was 38%; medical complexity (MC)-24%; social support need (SSN)-39%; serious mental illness (SMI)-14%. Two-thirds belonged to ≥ 1 group; one-third to ≥ 2 groups, with the three most common combinations: SSN+ID/SD-9%; MC+SSN+ID/SD-6%; and MC+ID/SD-5%. Sociodemographic characteristics (Table 1) and associations with specific support needs (Table 2) varied by HSN group. Only MC and SMI were associated with all specific support needs after adjustment. There was a dose-response relationship between HSN group count and all specific support needs.

Conclusions: Most autistic youth belonged to at least one of the four HSN groups included in this study, and all HSN groups were independently associated with greater specific support needs. Belonging to multiple groups was common and associated with greater support needs. Additional research to determine the presence and type of HSN across diverse groups is urgently needed to create equitable approaches to assessing service needs. New and modified policies and programs to improve access to services and outcomes could support individuals, families, and service system efficiency.



421.171 Identifying Depression in Minimally Verbal Adults: Parent-Reported Indicators and Potential Application of Existing Screeners

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Background:

As many as 30% of autistic individuals are minimally verbal (MV; Pickles et al., 2016), yet their mental health has been largely overlooked. High rates of co-occurring depression are reported in autism (Hollocks et al., 2019), depression is common and more enduring in adults with intellectual disability (ID) than the general population (Collishaw et al., 2004), and those with severe ID may be at even greater risk for mental health problems (Flynn et al., 2017). Measures may not adequately assess depressive symptoms in MV autistic adults. Failure to consider depression in MV adults leaves a significant number of individuals without appropriate supports and has negative consequences for quality of life.

Objectives:

The current study used open-ended questions to identify potential parent-reported indicators of depression in MV autistic adults and examined the psychometric properties, feasibility, and validity of three existing instruments (ADAMS, MIPQ, GDS) originally designed to screen for depression in those with ID.

Methods:

Parents of MV autistic adults in the US were invited via email to complete a battery of surveys through SPARK research match. After consenting, parents were asked about professional diagnoses and personal perspective on presence of depression. Parents then completed depression-related surveys about their MV adults (N=177; Table 1) in a random order. Qualitative content analysis was used to identify parent-described indicators of depression and psychometrics analyses to characterize the existing surveys.

Results:

Across the sample, 9% of MV adults had a formal depression diagnosis, though 40% of parents suspected the person was depressed. In response to "what makes you believe this person is depressed?" parents reported lack of motivation (e.g., socially withdrawn, withdrawn from activities, lack of communication) most frequently (65%). Other commonly reported symptoms included sadness (e.g., crying, sad facial expression; 49%) and other mood challenges (e.g., mood swings, bad mood; 31%). See Table 2.

The ADAMS Depression subscale, MIPQ, and GDS had acceptable internal consistency (ADAMS Depression $\omega=.81$; MIPQ $\omega=.95$; GDS $\omega=.75$). Mean time to complete surveys and percentage of parents completing the measure, proxies for participant burden, were reasonable (ADAMS: $M_{\text{minutes}}=2.9$, 99%; MIPQ: $M_{\text{minutes}}=4.4$, 98%; GDS: $M_{\text{minutes}}=2.4$, 98%). Factor analyses did not indicate good fit for any of the screeners and cognitive interviews with a subset of participants (n=18) found varying content validity and ease of completion. Correlations between the measures varied between .66 and .72. Full psychometric results will be presented.

Conclusions:

Parent-reported symptoms of depression in MV autistic adults generally overlap with traditional depression symptoms (e.g., mood, activity level), while some non-traditional symptoms were reported (aggression, repetitive behaviors). Existing screeners for depression in those with ID may be useful to identify patients who require further evaluation for a mood disorder. While some psychometrics features were acceptable, the poor fit of the factor structures questions if the measures should first be adapted for this population. The cognitive interviews suggest that some items are difficult to answer or response sets unclear. Results from the current study will critically guide adaptations and development of measures to evaluate depression in MV autistic adults.



421.172 Is Statistical Learning Impaired in Young Children on the Autism Spectrum Who Are Minimally Verbal?

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Background:

There is limited knowledge on how children on the Autism Spectrum extract patterns from experience and anticipate events accordingly, i.e., statistical learning. Given the role of statistical learning for language acquisition, statistical learning skills of autistic children who are minimally verbal is of particular interest.

Objectives:

This study aims to investigate if statistical learning abilities differ between TD and autistic children, including minimally verbal children.

Methods:

A novel eye-tracking statistical learning paradigm was administered to 46 children preschoolers, including typical children and children on the autism spectrum (both verbal and minimally verbal); see table 1.

Statistical learning was indexed as the anticipatory fixations in response to the observation of patterns of events in two conditions. In the deterministic condition, a video-animation showed the following sequence across four learning trials; (a) a ball is descending down a waterfall, (b) the ball is then occluded behind a bridge, and (c) the ball descends down the left stream of the waterfall (see figure 1). In the probabilistic condition the same scenario was presented, but the ball descended down the same waterfall in three of the four learning trials, while in one trial it descends down the opposite stream. Across conditions, the four learning trials were followed by a test trial, in which the ball remains occluded behind the bridge. Participants' anticipatory gaze was computed to determine whether they gazed towards the 'target location', i.e., the stream where they had previously seen the ball descending in all trials (deterministic conditions) or most trials (probabilistic conditions; see figure 1).

Results:

Repeated Measures ANOVA focused on gaze duration during the learning trials in the **deterministic condition** revealed a Location (target vs non-target) by Trial effect ($F(3,162)=3.04$, $p=0.03$), indicating that participants increased their attention to the target location. In the test trial there was a main effect of Location, indicating greater attention towards the target versus the non-target ($F(1,41)=19.60$, $p<0.001$), as well as shorter latency towards the target compared to the non-target ($F(1,41)=19.60$, $p<0.001$). Across analyses there was no effect of group (including when all children on the autism spectrum were grouped together).

In the **probabilistic condition**, analyses of gaze duration during learning trials revealed a Location by Trial effect ($F(3,160)=7.36$, $p<0.001$). A similar Location by Trial effect was found in the analyses examining gaze latency ($F(3,166)=4.27$, $p=0.006$), indicating that over the four trials participants increased the duration of attention and decreased the latency of attention to the target location. In the test trial there was no effect of location across gaze indexes. Across analyses there was no effect of group (including when all children on the autism spectrum were grouped together).

Conclusions:

The eye-tracking statistical learning paradigm elicited anticipation of future events across most indexes in our sample. This suggests that both typical and autistic preschoolers, including those who are minimally verbal, extracted deterministic and probabilistic patterns and anticipated events accordingly. Normative performance in the task by minimally verbal autistic children suggest that language difficulties in this population might be unrelated to statistical learning.



421.173 Minimally Verbal Children with Autism 'See the Point, but Do Not Point to What They See': A Behavioral and Eye-Tracking Study in Visual Perceptual Processing

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Background: During typical development, basic visual object recognition, unrelated to social interactions, begins to emerge within the first year of life. Shape processing involves both low-level visual cues, such as color and orientation, and more advanced mechanisms that rely on prior knowledge and inferences. However, little is known about basic, non-social, visual perceptual processing in minimally verbal children with autism (mvASD).

Objectives: Our objectives are to investigate basic, non-social, visual perceptual processing in older children with mvASD

Methods: We studied pointing and eye-gaze in twenty older (6-12 yrs) children with mvASD during low and mid-level visual processing tasks. In the oddball paradigm they pointed to an odd target among an array of distractors of varied difficulty and complexity consisting of low (e.g., color) and mid-level visual stimuli (e.g., 3D shapes). In the contour detection task, a circular contour was embedded among an increasing number of Gabor elements. In a third task a Kanizsa triangle was presented as well as modulated versions emphasizing illusory triangle (e.g a central dot in the triangle). Spontaneous pointing and eye gaze were recorded as distance from oddball target and Kanizsa center. Finally, during a computerized "Kanizsa dragging game" participants were dragging shape to correct Kanizsa.

Results: Our results suggest that children with mvASD are not a homogeneous group. While all children detected the odd target in the easiest condition of faint distractors, about half successfully detected it based on *all* low-level features. Importantly, some of these "high performers" deteriorated on mid-level visual tasks with higher stimulus complexity. Furthermore, some 'high performers' correctly detected the Kanizsa oddball but unlike TDs pointed to local inducers rather than Kanizsa center. Strikingly, mvASD participants who failed lowest level of visual oddball tasks presented with above chance eye-gaze to odd target. For the single Kanizsa, pointing and eye gaze were at the local elements, but shifted towards the center in modulated versions. 'High performers' successfully dragged shape to correct Kanizsa.

Conclusions: Participants could do the tasks, with performance sensitive to distractor saliency and stimulus complexity, but the group was not homogeneous. The results could not be explained by lack of cooperation or task comprehension. This suggests early visual processing differences among children with mvASD, and visual perception based on low-level representations with attenuated inference-based processing. However, eye gaze superior to pointing, shifting of pointing and gaze for the single Kanizsa, to the center, with minor modulations, as well as successful matching of shape to Kanizsa, indicate more complex perceptual representations *do* exist. It seems that among children with mvASD, performance does not solely rely on *what* they perceive, but also on *how* they use the visual signal to drive their behavior. They 'see the point, but do not (always) point to what they see'



421.174 Outcomes from a Statewide Dissemination of a Care Pathway for High Support Needs Autistic Youth in General Child and Adolescent Psychiatric Settings

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Background: Over the past nine years, our team has developed and implemented a training model to improve care for children and adolescents with autism spectrum disorder (ASD) and high support needs in psychiatric hospital settings. Given the lack of staff training in ASD, high utilization of psychiatric services by autistic youth, and the dearth of resources for the autistic population in psychiatric settings, this program was designed to educate staff to better address the unique challenges of autistic youth with high support needs and co-occurring psychiatric conditions. This model utilizes an evidence-informed approach to educate and support staff who work with high needs autistic youth (including Intellectual Disability) within emergency departments and psychiatric inpatient settings. Previous evaluations of the model implemented at one general inpatient psychiatric unit documented improved clinical outcomes for patients, including a significant reduction in the use of crisis interventions (i.e., therapeutic holds/restraints, administration of intramuscular medications) sustained over 36-months (Cervantes et al., 2019; Kuriakose et al., 2018). **Objectives:** Assess the outcomes from this specialized, comprehensive training model delivered to frontline staff working with autistic youth with high support needs in seven emergency and psychiatric sites throughout New York State (NYS).

Methods: A four-hour training, focusing on psychoeducation and strategies for autistic youth presenting with high support needs and challenging behaviors during their psychiatric admission, was conducted at seven sites throughout NYS. Pre- and post-training data were collected from the multidisciplinary (i.e., psychology, psychiatry, social work, nursing, occupational therapy, art therapy, public health, management) and sociodemographically diverse (e.g., racially diverse; highest degree ranging from less than bachelor's degree to doctoral degrees) staff who attended the training. Attendees completed the following scales before and after the training: The Challenging Behaviour Attributions scale (CHABA; Hastings 1997) Short Form (Hastings and Brown 2002), modified version of the Confidence in Coping with Patient Aggression Instrument (Thackrey 1987), assessment of knowledge of evidence-informed strategies for working with autistic youth (Donnelly et al., 2023). Following the training, staff were asked how appealing they found the training using the Appeal subscale of the Evidence-Based Practice Attitude Scale (EBPAS; Aarons 2004). Hourly biweekly follow-up consultations for six months post-training are currently in progress.

Results: A total of 263 individuals attended the training across the seven sites and pre/post data were available from 117 participants. Statistically significant pre/post differences were observed for all outcomes of interest including perceptions of behaviors, higher levels of comfort working with the ASD population, and more knowledge of evidence-based practices ($p < .05$); however, significance varied by site (Image 1). On a 5-point Likert scale, attendees found the training to be engaging ($M = 4.21$).

Conclusions: This evidence-informed training model is effective across diverse sites in improving knowledge and increasing staff confidence for working with this population with high support needs. Importantly, sites have integrated evidence-informed strategies into their standard care model to support autistic individuals. Additional analyses of these data on the impact of 6-month follow-up consultations is in process.

**421.175 Predictors of Treatment Outcome for Autistic Teens with Intellectual Disability Receiving CBT for Anxiety**

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Background: Autistic teens with intellectual developmental disability (IDD) experience significant anxiety; although, little is known about the initial efficacy of therapeutic interventions. While early studies have shown promising effectiveness of cognitive behavioral therapy (CBT; Blakeley-Smith et al., 2021; Blakeley-Smith et al, under review) teen factors that may impact treatment outcomes are currently unknown. For autistic individuals without IDD, child characteristics do not predict anxiety treatment outcome (Van Steensel et al., 2017); however, it is unclear if these findings hold true among the highly heterogeneous IDD population. Understanding these factors may help determine best candidates for CBT and whether adaptations are necessary for certain teens.

Objectives: To assess the impact of age, gender, adaptive behavior, expressive language level, psychiatric medication use, and medical complexity on treatment response following participation in Facing Your Fears-IDD (FYF-IDD), a group CBT anxiety intervention.

Methods: Fifty-three autistic teens ($M_{age}=15.18$, 65.5% Male, 76.4% white, 21.8% Hispanic) with IDD and anxiety participated in FYF-IDD. Participants met criteria for autism (ADOS-2; Lord et al., 2012), had scores in the ID range for IQ ($M_{FSIQ}=57.02$) and adaptive behavior ($M_{ABAS-3\ ABC}=59.13$), and met criteria for at least one anxiety diagnosis from the Anxiety Diagnosis Interview Schedule-Autism Spectrum Addendum (ADIS-ASA, Kerns et al, 2017). Expressive language level was identified by ADOS-2 Module ("minimally verbal" = Module 1 or 2, $N=15$; "fluent speech"=Module 3 or 4, $N=38$). Clinical Global Impressions Scale-Improvement (CGI-I; Guy, 1976) were completed using caregiver report from the ADIS-ASA at pre- and post-treatment. CGI-I scores ranged from 1 (Very Much Improved) to 7 (Very Much Worse) for Primary Anxiety (diagnosis with the highest interference at pre-treatment), Total Anxiety (overall improvement in diagnoses, except specific phobias), and Specific Phobias (overall improvement in specific phobias). Independent samples t-tests were conducted for language level, medical complexity, psychiatric medication, gender. Regression models were conducted for continuous predictors (ABAS-3 ABC and age).

Results: Teen age, use of psychiatric medication during treatment, medical complexity, and gender were not significantly related to CGI-I scores (all $p>.05$). Expressive language level was not significantly related to CGI-I for Primary Anxiety or Specific Phobia; however, teens who were minimally verbal demonstrated *greater* improvement (lower CGI-I) for Total Anxiety compared to teens with fluent speech ($p=.04$). ABC did not significantly predict Primary or Total Anxiety; however, higher ABC scores predicted *greater* improvement in CGI scores for Specific Phobias ($p=.03$).

Conclusions: Consistent with previous research on autistic youth without IDD, (Van Steensel et al., 2017), key teen characteristics were not significantly predictive of treatment outcome. Notably, autistic teens with lower expressive language showed greater improvements in overall anxiety, and should not be excluded from adapted CBT programs. These findings are somewhat surprising, given the significant heterogeneity in this population and the long-standing belief that adapted CBT is inaccessible for people with IDD. Further research is needed to understand the elevated anxiety remaining post-treatment for many participants. Limitations include: (1) results were based on parent report; (2) limited self-report measures to assess anxiety outcome in this population, and (3) a small sample size.

421.176 Profound Autism: An Exploration in a Clinically Referred Sample

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Background: The autistic population is highly heterogeneous, with a wide range of abilities and support needs. There are considerable challenges in understanding the heterogeneous needs and characteristics of people with an autism diagnosis. To better identify those autistic individuals who may require the most intensive support, the Lancet Commission in 2021 introduced the term "profound autism." This subgroup of individuals with autism is characterized by an intelligence quotient (IQ) below 50, minimal to no functional language, the need for 24-hour supervision, and assistance with daily living activities. While these characteristics go beyond the current, more non-specific descriptions contained in the DSM-5-TR levels and provide clear, objective criteria, the use of the term "profound autism", and how it should be applied, has faced criticism over recent years.

Objectives: In this study, we aim to apply the definition of profound autism to a large dataset from a diagnostic and assessment clinic. Our goal is to identify key correlates that distinguish children with profound autism from other autistic children. The demographic variables under consideration include age at first concern, age at diagnostic assessment, autism symptom severity, child gender, diagnostic comorbidities, and parental cultural background.

Methods: Participants were 526 children aged 1.53 – 16.73 ($M=4.75$, $SD=2.32$, 75% male), attending a tertiary-level assessment service. All children received a diagnosis of autism. Children were identified as meeting criteria for profound autism if they received a developmental or intellectual quotient of less than 50, were rated as having minimal to no language, and required substantial assistance with activities of daily living, as indicated by global impairments on adaptive functioning. In total, 142 children in our sample met criteria for profound autism.

Results: Profound autism was uniquely associated with younger age at diagnosis and younger age at first concern. Concerns were raised by caregivers over 5 months earlier in this group (21.63 months, compared to 26.39 months) and they received a diagnostic assessment one year earlier on average, compared to peers without profound autism (4.04 years, compared to 4.97 years). Children with profound autism had elevated symptom severity relative to peers who did not meet these criteria and received a greater number of comorbid diagnoses on average. There were no differences in child gender for children meeting criteria for profound autism, compared to those who did not. There was some evidence of an association between profound autism and CALD background, such that profound autism was more frequently seen in children of mothers from a CALD background, compared to a non-CALD background.

Conclusions: We examined unique profiles of profound and non-profound autism in a large community sample of children. A quarter of the sample met the profound autism criteria. They were likely to receive diagnostic assessments earlier and had more symptoms of autism than non-profound children and were at risk of increased comorbidities. We discuss the need to examine whether access to interventions and supports services differs for children with profound autism, and how the construct of profound autism can be best applied in research and clinical practice hereafter.

421.177 Reading Comprehension in Nonspeaking Autistic Children: A Systematic Review

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Background: Approximately 25% of autistic individuals are nonspeaking or minimally speaking (Rose et al., 2016) and will require augmentative and alternative communication (AAC) systems to meet their daily communication needs. Although studies have demonstrated that nonspeaking children can learn foundational literacy skills (e.g., Ainsworth et al., 2016; Caron et al., 2023; for review, see Mandak et al., 2018), it is unclear what we know about reading comprehension skills beyond simple letter-sound correspondence and single word decoding.

Objectives: To synthesize assessment and intervention procedures related to reading comprehension for autistic children who use AAC. To identify gaps in the research related to reading comprehension in nonspeaking autistic individuals.

Methods: To identify relevant studies, key words were identified and customized for each of 5 databases: PubMed, CINAHL, ERIC, PsycINFO, and SCOPUS (see Table 1). Inclusion criteria were: 1) participants under age 18, 2) participants with an autism diagnosis, 3) participants who were minimally or non-speaking and 4) measures or interventions of reading comprehension beyond single word decoding. Exclusion criteria were: 1) review studies, 2) book chapters, and 3) studies with solely fluently speaking participants. Identified articles were screened first by title and abstract; those chosen for inclusion were then read in full to determine if the study matched the inclusion and exclusion criteria. Those selected were placed into a data extraction sheet containing all critical study information such as i) quality assessment, ii) participant demographics, iii) measures, iv) results, and v) limitations. Categories were reassessed after entering 10% of the data to determine their relevance and adequacy (Pickering & Byrne, 2013).

Results: A total of 186 articles were identified through the database searches. After the removal of duplicates, 156 citations were imported into www.covidence.org. Two trained reviewers screened all articles for inclusion and 13 conflicts arose. Conflicts were resolved through discussion and vote among three team members. Through title and abstract screening, 132 articles were deemed irrelevant. Two reviewers performed a full-text review on the remaining 24 studies and 5 conflicts arose which were resolved through discussion and vote. Thirteen studies were eliminated for only including speaking participants, 2 were eliminated for including only children with intellectual disability without autism, 2 were eliminated because they only reviewed the existing literature, and 1 was eliminated because it did not include measures of reading comprehension. 6 studies were extracted for further analysis. Figure 1 reports the extraction process according to PRISMA guidelines.

Conclusions: The results of this systematic review will be discussed in light of each studies' participant characteristics and the ways that reading comprehension skills were measured and treated in nonspeaking autistic participants. We note a gap in the research literature in regards to innovative ways of measuring and improving reading comprehension in nonspeaking autistic children. The results will be used to guide the design of experimental studies on the assessment and treatment of reading comprehension skills for minimally speaking and nonspeaking autistic children.



421.178 Rosco: A Strengths-Based, Person-Centered Communication Sampling Paradigm for Non-Speaking Profoundly Autistic Individuals

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Background: Individuals with profound autism often remain non- or minimally-speaking throughout their lives. These individuals communicate multimodally through non-speech vocalizations, gestures, body movements, facial expressions, and augmentative communication devices.

However, they frequently score near basal levels on standardized language assessments, making it difficult to monitor their developmental progress and establish sensitive outcome measures for this population. Furthermore, logistical barriers such as geographical location, time constraints, and energy demands on caregivers limit access to clinical research, reducing participant diversity. To address these challenges, we developed ROSCO (Rapid Online Sample of Communication), a person-centered, remotely administered communication sampling paradigm that leverages caregiver knowledge to capture the full spectrum of communicative behaviors in this population.

Objectives: Design, implement, and evaluate the creation of the ROSCO paradigm.

Methods: The ROSCO paradigm was created in response to family-led requests for more accurate and sensitive communication measures for non- and minimally-speaking children [1] and has been iteratively refined based on continuous feedback from participating families using both qualitative and quantitative methods. Adjustments have been made to reduce attentional demands while balancing simplicity, engagement, and opportunities for spontaneous communication. Personalizable probes, including snack time, free play, communication temptations, and a familiar video altered to appear like it is buffering, are used to elicit naturalistic communication. The paradigm is administered entirely online via Zoom. Smartphones and tripods are sent to the families' homes to capture communication behaviors from multiple angles, ensuring high-quality data collection. Caregivers also participate in structured interviews with researchers while rewatching the recorded ROSCO session to provide additional insight into subtle communicative behaviors. Pilot testing has been conducted across 33 ROSCO sessions (n=26 unique participants) and is ongoing. Feasibility, data quality, and caregiver feedback measures have been obtained through completion rates, signal analysis, interviews and Likert-scale surveys. Preliminary data on the modality, function, and rate of communication have been obtained from samples coded using ELAN.

Results: The ROSCO paradigm has demonstrated exceptional feasibility, with 100% of sessions completed and 98% codeable data. Caregivers report high satisfaction with the remote format and appreciate the opportunity to contribute their insights into their child's communication. The paradigm has effectively captured a diverse array of quantifiable communicative behaviors, including non-speech vocalizations, gestures, body movements, facial expressions, and augmentative technology use (59.1 ± 19.2 communicative acts per session). These behaviors serve a range of functions (e.g., requesting, rejecting, commenting, and expressing emotions), underscoring the variability and complexity of communication in this population.

Conclusions: ROSCO represents a promising advancement in the naturalistic assessment of communication in non- and minimally-speaking individuals with profound autism. Its strengths-based, caregiver-informed design enables the measurement of a wide array of communicative behaviors that may be missed by traditional language assessments. The remote, accessible nature of the paradigm enhances participant diversity and provides a scalable solution for communication assessment in hard-to-reach populations. Ongoing work is focused on integrating machine learning and computer vision algorithms to scale coding efforts, as well as developing AI-enabled personalized communication technology tailored to this underrepresented population.

[1] Landlust et al., (2023)



421.180 Strategies for Engaging Adults with Profound Autism in Research: A Community-Based Participatory Research Approach to Intervention Development

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Background: Adults with profound autism and intellectual disabilities are often excluded from research, limiting the applicability of interventions for this population. This study addresses the need for inclusive research practices by employing Community-Based Participatory Research (CBPR) to engage individuals profoundly impacted by neurodevelopmental disabilities such as profound autism. Our partnership focused on collaboratively adapting a digital literacy intervention to reduce challenging online behaviors and enhance psychological well-being.

Objectives: The primary aim was to establish a research partnership with a community organization supporting adults with profound autism to address online behavior and safety concerns. Specifically, we utilized CBPR strategies to adapt the SELFI program (Osuna et al., 2023), a social media skills intervention originally designed for autistic adults without intellectual disability, for this population. Our goal was to develop strategies for meaningful partnerships with self-advocates, caregivers, and community organizations using participatory research methods.

Methods: Guided by the Map of Adaptation Process framework (MAP; McKleroy et al., 2006), we partnered with a community-based organization providing interventions to adults with profound autism. Collaborating with autistic self-advocates, we shaped research methodologies, intervention materials, curriculum content, and delivery approaches. Over three years, we conducted two studies: (1) technology-use surveys and interviews with 38 adults with intellectual and developmental disabilities and their caregivers, and (2) collaborative adaptation of the SELFI program (n=16). CBPR strategies used included building equitable partnerships, co-learning, co-design, shared decision-making, and dissemination of findings.

Analysis involved reviewing field notes, community feedback, and accessibility improvement strategies.

Results: The partnership effectively engaged adults with profound autism and their caregivers. An equitable research team was established, including an autistic self-advocate, a caregiver, an interventionist, and program administrators. Through co-learning, we identified intervention goals and priorities through a mixed-methods study with 38 participants. In co-design, community partners shared decision-making in study procedures and intervention development. Our self-advocate co-researcher ensured accessibility by reviewing and providing feedback on study materials, including consent documents and surveys. Collaboration was enhanced through one-on-one meetings, visual aids, and involving partners in disseminating findings.

Conclusions: This study demonstrates that CBPR can effectively include adults with profound autism in developing interventions aimed at reducing challenging online behaviors and enhancing digital well-being. Implementing these research approaches enhances the accessibility and impact of interventions by creating inclusive environments that actively involve adults with profound autism. These practical guidelines support inclusive intervention development and improve the validity and implementation of treatment interventions for people with profound autism.

Poster Session

422 - International and Cross-Cultural Perspectives II

May 2nd, 2025, 12:30 PM - 1:30 PM - Hall 4A

422.181 Access to Educational Services: Uruguay's Regulatory Dilemma

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Background:

Autism research has been, and continues to be, overly concentrated in high income countries. As such, the known social and cultural experiences of families raising a child with autism continue to be mostly representative of White, upper-middle-class individuals in high-income countries (Durkin et al., 2015; Talantseva et al., 2023). However, in low- and middle-income countries (LMIC), those with autism are met not only with limited community awareness and trouble accessing a diagnosis and evidence-based interventions but also with educational barriers due to fragmented infrastructure, poorly drafted policies, and limited number of trained professionals (Masri et al., 2023; McConkey, 2022; Silvestre Paula et al., 2020). In Uruguay, individuals with ASD are met with delays in identification and intervention (Montiel-Nava et al., 2020; Silvestre Paula et al., 2020), as well as barriers to educational attainment (Candido & Tilve, 2023). This in-depth exploration of cultural, social, and political influences impacting barriers to educational services in Uruguay will inform needed steps towards inclusive educational attainment and maximization of developmental outcomes.

Objectives:

Utilizing the Theory of Change (TOC) framework developed for LMIC (Divan et al., 2021), the present study explored participants' experiences regarding accessibility to autism educational services and legislation and policies in Uruguay.

Methods:

The study included semi-structured interviews with twelve caregivers of individuals with autism and four key stakeholders using purposive sampling. The interviews were guided by topics covered in the 100-Day Kit for Young CHildren (Autism Speaks, 2020). Data analysis consisted of reflexive thematic analysis with a critical realism approach and a deductive orientation to ensure the TOC framework's use to help generate codes and themes (Braun & Clarke, 2022).

Results:

Results indicated that schools are not equipped to instruct autistic children due to a lack of trained professionals or resources for special education. There are no uniform guidelines for inclusion or school attendance, resulting in denial or limits to enrollment. Another theme centers around the role of the "acompañante," a state-assigned helper for those with disabilities. Although not designed for educational supports, many schools now require them for autistic children to enroll. However, funding shortages have led to a lack of these professionals, resulting in denied enrollment, a violation of students' right to education. Another salient theme indicated that despite multiple laws being established to protect autistic individuals' rights, due to fragmented and subpar planning strategies the implementation of said laws results in a confusing and chaotic process that further delays educational access.

Conclusions:

Despite the multiple laws and policies available, much remains to be done to ensure policies are enforced due to infrastructure, financial planning, and changes in political impetus. Results here may highlight pathways towards universal access to inclusive educational services. For Uruguay and other countries, it is imperative that laws passed include planning and adequate funding. It is also essential that parents and autistic individuals are included in the process of policy making to ensure laws remain relevant independent of changing political alliances.

422.182 Implementation of Parents Taking Action: A Culturally Adapted Training for Caregivers of Young Children with Autism in Paraguay

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Background:

The demand for services and resources to support individuals with autism has increased in correspondence with the rising prevalence of autism around the globe. However, access to resources to support children with autism and their families is inequitable. Specifically, caregivers and researchers report that there is limited availability of resources and services to support autistic children and their families in low-to-middle-income settings and countries. Training caregivers and building their capacity may be a cost-effective and appropriate way to deliver support for caregivers of autistic children in low-resourced settings. Caregiver training is an evidence-based practice that leads to positive outcomes for both caregivers and their autistic children. However, to date, most caregiver training research has been conducted in high-income countries and researchers emphasize the need to consider contextual local and cultural aspects when providing caregiver training in different settings. Culturally appropriate caregiver training may be an effective way to provide support to these families.

Objectives:

1. Pilot the implementation of a culturally adapted caregiver training (i.e., Parents Taking Action) with caregivers of young autistic children in Paraguay.
2. Assess the impact of the culturally adapted training on caregivers' knowledge about autism, understanding of their children's needs and strengths, and empowerment.
3. Assess the social validity of the goals, procedures, and outcomes of the culturally adapted training.

Methods:

We used a convergent mixed-methods design including a single-arm pre-post design and semi-structured interviews, to evaluate the overall impact of the culturally adapted Parents Taking Action Program for caregivers of autistic children in Paraguay. The program included ten 2-hour long sessions and was co-delivered by caregivers of autistic children from Paraguay and a Paraguayan researcher, in an online synchronous group format over a 3-month period. Overall, 22 caregivers started the program and 17 completed the program.

Results: Results comparing pre-post scores showed statistically significant increases in caregivers' knowledge about autism, their understanding of their children's strengths and needs, and their advocacy knowledge and skills. Attrition was 22.72%. Additionally, caregivers shared their experiences with the program and valued the opportunity to access high quality information and meet other caregivers of autistic children. Through the integration of quantitative and qualitative findings we generated four meta-inferences: (a) Caregivers of autistic children in Paraguay need support and training, (b) The online group training program supported learning of new knowledge and provided a sense of belonging for caregivers of autistic children, (c) Caregivers gained knowledge and were able to better understand their autistic children's strengths and needs through the program, and (d) The program was feasible and acceptable in the Paraguayan context.

Conclusions: Caregivers of autistic children can benefit from support and training tailored to their needs. The implementation of the culturally adapted Parents Taking Action program in Paraguay yielded promising outcomes and was found to be socially valid. While research employing more rigorous designs and with larger samples is warranted, these findings highlight the feasibility and acceptability of adapting programs to expand access to support and training for caregivers of autistic children in low-to-middle-income countries.

422.183 Inclusion of Participants with Limited English Proficiency in Autism Research

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Background: Disparities exist in the quality of care and healthcare outcomes for patients with autism who speak a non-English primary language and have limited English proficiency (LEP), defined as having a limited ability to read, write, or understand English. A critical step in improving equity for LEP patients with autism is ensuring inclusion in research, however, there are no standard LEP inclusion guidelines for research and no recommended practices for translation and interpretation services. While the prevalence of autism has been increasing in the United States, we hypothesize that representation of LEP patients in autism research has not followed the same trend.

Objectives: To determine how frequently US research studies about autism include LEP participants, which languages are included, how research teams communicate with LEP participants.

Methods: All human research studies (n =872) published in *Autism*, *Autism Research*, *Journal of Autism and Developmental Disabilities*, and *Research in Autism Spectrum Disorders* from 2013-2023 in PubMed and Scopus were reviewed using Covidence systematic review software. Studies were first screened to include those that were about autism, included U.S. participants, were original research studies, and were not secondary data analyses. Studies meeting these inclusion criteria were then evaluated to determine whether they included LEP subjects, which languages were included, and methods of oral and written communication with LEP participants.

Results: Of the 872 articles screened, 282 (32%) met our inclusion criteria. Of these studies, 49 (17%) included LEP participants. Of those 49, 22 (45%) specified how oral communication occurred with participants, while 27 (55%) described how written communication occurred. The most common languages specified were Spanish (69%), American Sign Language (14%), Korean (14%), and German (14%).

Conclusions: This review of articles from four major autism journals provides preliminary evidence to suggest that LEP participants are not well-represented in U.S. research studies about autism. This research presents an opportunity to inform more accessible and inclusive healthcare practices and help facilitate institutional- and policy-level changes that improve representation in autism research and access to interventions.

422.184 Indigenous Sámi Experiences of Autism in Norway

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Background:

To our knowledge there is no research about autism in Sámi contexts as well as a paucity of research about global Indigenous perspectives on autism, but we also know that Sámi are not focused on diagnoses as the case usually is in dominant Western perspectives (Lindblom and Jannok Nutti, accepted). The Sámi are the only recognized Indigenous peoples in Europe and their traditional homelands, Sápmi, spread over the northern parts of the countries now known as Norway, Sweden, Finland and the Kola peninsula in Russia. Due to colonization, Sámi no longer live solely in Sápmi. The Norwegian Autism Association states that up to 1% of the population may have autism (Norwegian Autism Association, 2024). The report to the Storting (St. Meld 13, 22-23, pp. 22) refers to statistics from GSI showing 2546 pupils receiving education in Sámi. Based on these numbers, approximately 25 Sámi children may be autistic. However, in Norway registering information on ethnicity and/or disability is not permitted. Therefore, there are no statistics on autistic Sámi (Øzerk and Øzerk, 2020). This indicates that the situation for autistic Sámi children and youth is in acute need of research to ensure that they receive special education services equitable to that of other autistic children and youth in Norway.

Objectives:

The primary objective of this presentation is to put focus on Indigenous Sámi experiences of autism utilizing previously unpublished results from a research project on Sámi perspectives on diversity, inclusion and special educational support in Norway. Literature on other Indigenous perspectives on autism will be used to contextualize the Sámi-specific.

Methods:

Research conversations were held with ten Sámi special education teachers in Norway. Autism was mentioned by four of the research partners, which was found through a word search “autism” in the transcripts of the interviews.

Results:

Sámi special education teachers need knowledge on many different conditions and disabilities, such as autism, as there are very few Sámi special education teachers who speak a Sámi language, have cultural competence, specific topic and special educational knowledge (see Lindblom and Jannok Nutti, accepted). Contrary to Western dominant perspectives, Sámi worldviews focus on equality and not on diagnoses, and many times families to autistic children may not want others to know about the diagnosis. There are no specific activities directed to autistic Sámi children.

Conclusions:

There appears to be no previous research on autism in Sámi contexts. This paper reveals some Sámi special education teacher's thoughts on autism that indicate that Sámi experiences of autism differ from dominant views. In conclusion, this topic requires more research.

422.185 International and Cross-Cultural Perspectives: Autism in Rural North Indian Villages

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Background:

In rural India, the trend is for autistic children to remain undiagnosed and not in school. Access to health and support services is limited, as is community and professional awareness of autism. Without disability certification, children cannot receive disability pensions or access to special education and government services.

In 11 villages in Rajasthan and Bihar, 25 disabled and potentially autistic children had either not received formal diagnosis or been misdiagnosed. Only 3 of these children were in education. This is attributed to a combination of poor access to health services, expertise, and specialists and the challenge of resource-intensive, time-consuming, and bureaucratic-intensive procedures involved in diagnosis and disability certification. In these communities, there is also a lack of awareness of autism and a lack of confident, trained, and specialist teachers.

Objectives:

The research objectives are:

1. To identify autistic children in the village communities (Figure 1)
2. To identify and explore key issues that these children and their families are facing related to diagnosis and education.
3. To provide support with diagnosis, disability certification, and pensions (Figure 2)
4. To explore best practice, co-design, and implement a training program for members of the communities: raising awareness of autism; learning to screen and support autistic children; and empowering teachers to deliver inclusive education (Figure 1).

Methods:

A PhD student researcher lived in the communities for 3 to 6 months over 2 years. Applying mixed methods, a range of data collection methods were used: interviewing parents, teachers, doctors, and health workers; observing children; conducting screening; assessing children's cognitive abilities with games; ethnography; use of an autism screening tool; and 3 surveys before and after training.

Training in English was delivered for 20 PhD scholars assigned to villages in India and in Hindi for 15 village teachers, 6 early years teachers, and 5 village coordinators.

Results:

25 children were identified by community members for screening. Of 25 children, 6 children displayed strong autistic traits. The remaining children had hearing impairment, visual impairment, cerebral palsy, and other disabilities.

Some families were reluctant to accept support or pursue diagnosis because of stigma or because of the time involved and the lack of perceived advantages; in both states, the monthly pension is approximately four US dollars.

13 of the children were supported with diagnosis, disability certification, and applications for pensions. Four families had already obtained disability certification through private means. Six children were given additional support with education.

Conclusions:

Community members are equipped to support children and their families and continue to register them. Awareness of the potential benefits for children has been raised, as has their potential in education. The children in the study are more engaged and valued in the community.

Lessons learnt and the training program have the potential to benefit other communities in India as well as in rural communities in other countries.



422.186 Knowledge and Perceptions of Autism and Developmental Disabilities in Bolivia

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Background:

An estimated 240 million children worldwide are classified as having autism or other developmental disabilities (DD), a majority of whom live in low- and middle-income countries, such as Bolivia (UN Children's Fund, 2021; WHO, 2011). While progress has been made in the recognition of rights for individuals with disabilities in Bolivia, these individuals continue to face discrimination, social stigmatization, and poor education and employment outcomes (Garcia-Domingo, 2022). A lack of knowledge or general understanding about autism/DD in Bolivia may lead to these poor outcomes for individuals.

Objectives:

The objective of this qualitative study was to explore the perceptions and knowledge of autism and other DD among the general population in Bolivia.

Methods:

This qualitative study will use a phenomenological approach to assess community members' perceptions of autism/DD in Bolivia. We sampled parents of children without developmental concerns who had no formal training or experience in child development or DD. We conducted two focus groups (n=12 and n=4; parent age $M=37.27$ yrs) in Cochabamba and Tarija, Bolivia. Eleven mothers and five fathers represented 32 children (child age $M=10.74$ yrs). Participants were asked about their perceptions of the causes, courses, and appropriate treatments for autism and DD. Focus groups were audio recorded, transcribed by Bolivian professionals, and translated into English. We used a grounded theory approach to analyze transcripts, including thorough review, inductive and deductive coding, and categorization of codes. Detailed code summaries will then be followed by theme and subtheme development (Braun & Clarke, 2006). Member checking will further refine themes.

Results:

Preliminary analyses revealed topics related to a range of beliefs of the causes, onset, symptoms, and treatments of autism/DD. Common perceptions about the causes of autism/DD included those with evidence-based support (e.g. genetic and environmental factors) as well as local traditions and cultural beliefs (e.g. child traumas, timing of first haircut). Participants perceived that the onset of autism/DD could range from birth to 2-4 years of age. They described symptoms they believed were indicative of autism, including language, attention, and communication difficulties. Participants noted a variety of treatment options, from dietary cleanses and cultural healers to medication and behavioral supports. Parents described a recent change in the general population's perceptions of autism, specifically, where discrimination was quite pervasive in the past but positive perspectives of neurodiversity and inclusion are growing. Media portrayals appeared to influence participants' beliefs surrounding whether individuals with autism/DD could live a "normal" life. Some participants indicated that individuals could live a completely independent life while others argued that these individuals will always require support.

Conclusions:

Our preliminary findings underscore the importance of increasing awareness and knowledge of autism and DD in the general population in Bolivia. Educating the community on best practices for autism and other DD, especially early in life, will likely lead to improvements in care for individuals with autism and other DD in Bolivia. These findings may be relevant among other similar Latin American countries.

422.187 "I Have Never Had the Opportunity to Have Videos That Were in Our Language": Enhanced Acceptability and Effectiveness of Executive Functioning Support Videos Among Spanish-Speaking, Versus English-Speaking Parents

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Background: Service systems for children with neurodivergent (ND) conditions, i.e. autism and/or ADHD, often fail to meet the treatment needs of Spanish-speaking families. We examined the acceptability and effectiveness of parent support videos for the executive functioning (EF) intervention *Unstuck and On Target (Unstuck)* between monolingual Spanish-speaking, bilingual, and monolingual English-speaking families. **Objectives:** Hispanic families with ND children face significant challenges in accessing services due to factors such as language barriers, limited awareness of the different types of available services, and socioeconomic status (SES). One promising practice to reduce barriers to access to treatment services is caregiver-mediated intervention models which aim to increase caregiver knowledge and efficacy while also reducing caregiver strain or sense of burden. Utilizing this model, a set of freely available brief videos that explain EF, how challenges with EF can present in ND children, and strategies that caregivers can use to support EF in their children were created for families of ND children.

Methods: 12 support videos developed with parents, professionals, and self-advocates were originally created in English and later translated to Spanish. 139 caregivers of ND children (English speakers $n = 87$; Spanish speakers $n = 37$; Bilingual $n = 15$) reviewed the videos and completed surveys both before and after watching them. Spanish-speaking families also completed follow-up focus groups after survey completion. Focus groups were transcribed verbatim and analyzed using rapid qualitative methods.

Results: Caregivers across language groups demonstrated improvements in EF content knowledge, $F(1) = 152.82, p < .001$, and self-reported strain over time, $F(1) = 13.04, p < .001$, with no significant group differences or group by time interactions. There were significant differences between the language groups on informativeness/usefulness, $H(2) = 31.40, p < .001$, efficacy $H(2) = 16.91, p < .001$, value $H(2) = 13.40, p = .001$, and likelihood to recommend the videos $H(2) = 11.26, p = .004$, with Spanish-speaking caregivers reporting even greater ratings of acceptability than English-speaking caregivers who had previously reviewed the same videos. Spanish-speaking caregivers reported the greatest improvements in caregiver-reported frequency of child EF difficulties, $F(1) = 40.21, p < .001$, and caregiver-reported disruptiveness of child EF difficulties, $F(1) = 16.93, p < .001$.

Rapid qualitative analysis of focus groups revealed a range of themes. These were: 1) enjoyed the videos overall and found the content useful and relevant; 2) videos changed how they conceptualized some of their child's challenges; 3) appreciated the feasible and practical delivery modality; 4) shared the videos with others; 5) noted areas where videos could be improved; and 6) provided suggestions of other topics that could be covered in additional videos. Results highlight future directions that may be helpful in improving the fit between *Unstuck* and Spanish-speaking families. **Conclusions:** Spanish-speaking caregivers rated *Unstuck* intervention and supplemental materials MORE positively and reported greater child EF improvements than their English-speaking peers. This supports the feasibility and highlights the outsized impact of providing these types of materials in both languages. Adapting the videos culturally and linguistically may be an important next step.



422.188 Let's Not Start from Scratch: Expanding Autism Clinical Capacity from Existing Cerebral Palsy Clinical Services across Mexico.

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Background:

Autism clinical capacity in Mexico is limited, centralized to major urban areas, and heavily reliant on private out-of-pocket service providers, leaving the most vulnerable populations unattended (Zavaleta-Ramirez et al., 2018). To improve autism care in LMICs, leveraging existing healthcare systems with innovations in community participation can help integrate specialized training and support for autism, maximizing resources and reaching more families (Divan et al., 2021). Teleton Network is a non-profit organization providing clinical services for children with cerebral palsy and other motor impairments. Teleton has been in operation for over two decades and operates 24 centers nationwide with funding from private donations, state government contracts, and federal public health funding. Starting in 2022, all Teleton centers started offering diagnostic and intervention services for children and youth on the autism spectrum, stemming from the existing infrastructure and public trust built upon their work with cerebral palsy and motor-related disabilities.

Objectives:

To conduct a program evaluation of Teleton's first 18 months of operation providing autism diagnostic and intervention services, after expanding existing clinical capacity in centers for cerebral palsy.

Methods:

Policies and procedures were documented collecting information from planning stages (prior to launching of autism services) and fidelity across centers was measured. The following variables were collected 18 months after the launch of autism services, by center: average usage of services across areas by patient, percentage of center capacity usage and percentage of waitlist from autism patients, certifications and trainings completed by center clinicians, and training needs reported by clinician specialty. In addition, entry and periodic Functional Independence Measure (WeeFIM) were assessed for patients.

Results:

Fidelity of implementation of the intake and assessment procedures indicated satisfactory implementation of autism clinical services protocols across all centers.

Twenty one of the 24 centers reported a capacity usage within the maximum allotted to autism services (30%). Seventeen centers reported a waitlist within allotted slots for autism patients (25%). The clinicians who had completed the most amount of autism-specific training were Psychologists and Speech Therapists (64% and 60%, respectively). Physical Therapists had the highest percentage of clinicians attending autism conferences (49%). The most frequently reported topics for training needs across clinical specialties were behavioral management and sensory integration.

Comparative entry and discharge daily function skills scores for patients showed that, on average, autism patients increased two points on the Cognition scale from entry to discharge, and one point on the Personal Care and Mobility scales and Overall scores, as evaluated by WeeFIM.

Conclusions:

Although centers are experiencing high demand for autism services, most of them are able to meet the capacity goals while maintaining existing clinical capacity for cerebral palsy-related services. Overall, autism patients increased their daily living skills profile during their enrollment at Teleton clinics. Streamlined procedures to shorten waitlists for autism diagnostic assessments and intensive efforts to implement parent-delivered behavioral supports are underway.

422.189 Maintaining Training Fidelity and Adaptation in Who-CST Implementation: Perspectives from Community-Based Interventions in Resource-Limited Regions in China

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Background: The World Health Organization's Caregiver Skills Training (WHO-CST) aims to empower caregivers of children with developmental disabilities and Autism Spectrum Disorder (ASD) through a community-based model utilizing non-specialists as intervention mediators. This approach is particularly important for resource-limited regions in China, where it helps establish an accessible and scalable family intervention model for ASD. While exploring the effectiveness of CST for Chinese families of children with ASD, our research also investigates how to balance maintaining fidelity to the original CST facilitator training model with meeting the rapidly growing needs of families.

Objectives: To identify the factors that contribute to early success among facilitators. To assess the scalability of training non-specialist facilitators in underserved regions while maintaining intervention quality and addressing local cultural needs.

Methods: We analyzed the characteristics of facilitators trained under the CST program and their challenges encountered during post-session practices. Additionally, we examined their performance on the CST Adult/Child Interaction Fidelity Rating Scale. Specifically, we compared facilitators who passed the evaluation in the early stages (requiring ≤ 3 submissions) to those who passed later (requiring ≥ 4 submissions) to identify factors that might influence successful facilitation.

Results: Our findings indicated that 9 facilitators (60%) passed the evaluation in the early stages, whereas 6 facilitators (40%) achieved it later, with the latest facilitator passing at week 18. Early-stage passers demonstrated higher consistency in core competencies, particularly in maintaining fidelity during adult-child interactions, which may have been influenced by their baseline characteristics and adaptability to the CST training model. Conversely, those who required more attempts faced challenges in skill application, particularly in translating theoretical knowledge into effective practice during family interventions. We employed an extended ordered logistic regression model, which included an offset for work group, indicate that age group remains a statistically significant predictor of the timing of achieving fidelity ratings ($\beta = 5.13$, $SE = 1.57$, $z = 3.27$, $p = 0.001$). Participants aged over 35 years demonstrated a substantially higher likelihood of delayed success compared to their younger counterparts (≤ 35 years), with a 95% confidence interval for the coefficient ranging from 2.06 to 8.21. The model's log likelihood was -8.35, and the Wald chi-square was 10.70 ($p = 0.0011$), indicating a strong and significant overall model fit.

Conclusions: Our study highlight that specific facilitator characteristics, such as adaptability and early skill acquisition, are pivotal for early success in the CST program. Identifying and targeting these characteristics during facilitator recruitment and training could enhance the overall efficiency of the program. The findings of underscore age-related differences in the timeline for achieving fidelity ratings, with younger assistant facilitators more likely to succeed on the first attempt compared to older facilitators. This outcome suggests a need for further exploration into the factors contributing to delayed success among older participants, potentially informing tailored intervention strategies to better support diverse age groups. Tailored support and focused training on challenging aspects of adult-child interactions may help facilitators achieve proficiency sooner, ultimately benefiting families in resource-constrained settings by providing timely and effective intervention.

422.190 Navigating through Diagnosis: A Meta-Synthesis of Parental Experiences in Low- and Middle-Income Countries during the Neurodevelopmental Disabilities Diagnostic Journey for Children

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Background:

Families of children with neurodevelopmental disabilities (NDDs) in low- and middle-income countries (LMICs) face significant challenges in obtaining an accurate diagnosis. These include logistical barriers such as geographical and financial constraints, as well as systemic issues like the lack of trained professionals, misdiagnoses, and long referral processes. The emotional toll on parents, coupled with inconsistent support from healthcare providers, further complicates the diagnostic journey. Understanding these experiences is essential for improving care and addressing gaps in service delivery.

Objectives:

This meta-synthesis aims to consolidate qualitative and mixed-methods research exploring the experiences of parents as they navigate the process of obtaining a diagnosis for their child's NDD in LMICs. It seeks to understand key themes such as healthcare interactions, emotional reactions, coping mechanisms, and overall satisfaction with the diagnostic process, with the goal of informing strategies to improve diagnostic pathways and support systems.

Methods:

A systematic search across six major databases—PsycINFO, EMBASE, MEDLINE, ProQuest, CINAHL, and PubMed—was conducted to identify studies published between 2004 and 2024. Qualitative and mixed-methods studies were included if they focused on parental experiences of NDD diagnosis in LMICs. A total of 3,076 articles were screened, with 22 meeting the inclusion criteria. The studies were appraised using the Critical Appraisal Skills Programme (CASP) tool for qualitative research and the Mixed Methods Appraisal Tool (MMAT) for mixed-methods research. A meta-synthesis was performed using thematic synthesis to integrate findings across studies, identifying cross-cutting themes.

Results:

The findings revealed recurring challenges faced by parents, including prolonged diagnostic timelines, frequent misdiagnoses, and inadequate healthcare provider knowledge. Many parents reported experiencing emotional turbulence, ranging from denial and guilt to relief after receiving a diagnosis. The lack of accessible and reliable post-diagnostic support services further compounded these difficulties, leaving families feeling isolated. Financial strains and interpersonal relationship stress were also commonly reported, particularly in resource-limited settings.

Conclusions:

This meta-synthesis highlights critical gaps in the diagnostic processes for NDDs in LMICs, emphasizing the need for better-trained healthcare professionals, streamlined diagnostic pathways, and enhanced support systems for families. These findings underscore the importance of culturally sensitive, family-centred policies to improve both the diagnostic journey and long-term outcomes for children with NDDs in LMICs.

422.191 Parent-Child Interaction Therapy for Toddlers in a Sample of Japanese Autistic Children

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Background: Autism diagnoses have been increasing in prevalence in Japan (with a recent rate of 3.22%; Saito et al., 2020), and other statistics show that 6.5% elementary- and middle-school children have mild developmental disabilities (including autism, attention deficit/hyperactivity disorder, and learning disability; Mithout, 2016). Caregivers of children with developmental delays have shown an increased risk for elevated stress and negative mental health (Tomanik et al., 2004). This is important as parental mental health problems may decrease a caregiver's ability to respond and communicate effectively with their autistic or developmentally delayed child, decrease their feelings of closeness to their child, and increase their risk of child abuse (Davis & Carter, 2008; Farrugia, 2009; Kimura & Yamazaki, 2016; Mak & Kwok, 2010). Parent-Child Interaction Therapy is an effective treatment targeting behavioral concerns and emotional dysregulation for children aged 2-7 years (Eyberg & Funderburk, 2011). To address the need for family-based preventative intervention options for children below 24 months, PCIT for Toddlers (PCIT-T) was developed with an emphasis on the fundamental role attachment plays for emotion and behavior regulation (Girard et al., 2018).

Objectives: The present study explored if participation in PCIT-T led to changes in child social and emotional development.

Methods: To address the need for preventative interventions, PCIT-T was implemented in a community sample with Japanese clinicians and families. Seventeen autistic children ($n = 17$) and their families received PCIT-T and completed the Devereaux Early Childhood Assessment (DECA; LeBuffe & Naglieri, 1999) to measure child social and emotional development (36-item measure, 5-point scale [0 = Never, 4 = Very Frequently]). The DECA yields scores for an Initiative scale, an Attachment/Relationships scale, and a Total Protective Factors scale.

Results: The differences between the pre- and post-treatment DECA t -scores for the Initiative ($t(10) = -2.96$, $p = .014$), Attachment/Relationships ($t(10) = -2.79$, $p = .019$), and Total Protective Factors scales ($t(10) = -2.49$, $p = .034$) were all statistically significant.

Conclusions: These results show an improvement in child social and emotional development. Overall, this provides promising support for the use of PCIT-T in Japanese families with autistic toddlers.

422.192 Patterns of Clinical Presentation and Diagnosis and Predictors of School Placement Outcomes in Autistic Children in Singapore: A Retrospective Cohort Study

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Background: In 1998, a national Child Development Programme (CDP) was established in Singapore by the Ministry of Health, and has evolved into a nationwide community-based, family-focused and child-centric network of services with collaboration between various government bodies and voluntary welfare organizations. In 2007, the CDP received between 1200-1400 new preschool referrals per year and saw 4000-5000 follow-up medical consultations. Today, the numbers of new referrals have increased exponentially to over 5000 children per year, with autism forming a quarter of CDP diagnoses. Therefore, having data on diagnostic patterns and longer-term outcomes would greatly facilitate national resource provision and planning.

Objectives: The aims of this study were to examine patterns of clinical presentation, diagnosis, cognitive and adaptive functioning, and school placement outcomes in autistic children in Singapore, and to examine for earlier predictive factors of final cognitive and school placement outcomes.

Methods: Retrospective data were manually extracted from medical records of a specialist developmental pediatrics service for children a) born in 2008-2011, b) referred to the Autism Clinic, and/or c) ever given a diagnosis of autism. Children seen in this service receive an initial clinical diagnosis based on history and clinical features, before being referred for a detailed assessment comprising an autism-specific interview with caregivers and direct observations of the child using the Autism Diagnostic Observation Schedule (ADOS). Data items included demographic data, diagnostic methods, psychological assessment results, early intervention attendance and final school placement outcomes. Binomial logistic regression analyses were conducted to analyze the relative contributions of various factors in predicting school placement outcomes (mainstream versus special education [SPED] school).

Results: 2124 children (82.6% male; Chinese 74.1%, Malay 13.5%, Indian 9.0%, Others 3.4%) were diagnosed with autism from the 4 birth-year cohorts. The mean (SD) age of first clinical diagnosis of autism was 3.56 (1.14) years, with 81.0% of children receiving a concordant initial clinical diagnosis prior to the ADOS. 1811 (85.2%) had a formal diagnostic assessment using the ADOS at a mean (SD) age of 4.16 (1.11) years. Of 1326 with cognitive and adaptive assessment results, 220 (16.6%) had mild and 262 (19.8%) had moderate-severe cognitive impairment. There were almost twice more Malay children than expected with co-occurring intellectual disability. Of 1483 with school placement outcomes, 681 (45.9%) went to mainstream school, 323 (21.8%) entered SPED schools offering the national curriculum, and 479 (32.3%) required SPED schools offering a customized curriculum. Binomial logistic regression models showed that factors which predicted SPED school placement outcomes included lower mother's educational level, higher ADOS scores, higher DSM-5 social communication level of support, and Malay race.

Conclusions: This study provides useful insights into the patterns of clinical presentation, diagnosis, cognitive and adaptive functioning, and school placement outcomes in autistic children in Singapore. Such information can be useful for resource planning purposes for national agencies or ministries involved in providing autism diagnostic, early intervention and educational services. Racial group differences in autistic children in Singapore exist that warrant more investigation into possible causes and support systems needed, with implications for other ethnically diverse nations.

422.193 Psychosocial Interventions for Disruptive Behaviours in Children and Adolescents with Autism and Other Neurodevelopmental Disorders in Low- and Lower-Middle-Income Countries: A Systematic Review

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Background:

Neurodevelopmental disorders (NDDs), including autism spectrum disorder (ASD) are significant public health challenges globally, especially in low- and lower-middle-income countries (LLMICs). Disruptive behaviours like aggression and self-injury affect children and adolescents, reducing their quality of life and stressing caregivers. Psychosocial interventions for managing disruptive behaviours has proven effective in high income countries however these are understudied in low- and middle-income countries (LLMICs). It clearly shows a need for a systematic review to determine the effectiveness of different psychosocial interventions in these settings. This will help inform future research and guide the development of evidence-based interventions for children and adolescents with NDDs in LLMICs.

Objectives:

This systematic review aimed to assess the effectiveness of psychosocial interventions in reducing disruptive behaviors among children and adolescents with Autism and other NDDs in LLMICs.

Methods:

This review adhered to PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines and was pre-registered with (PROSPERO 2024 CRD42024498910). A comprehensive database (PsycINFO, MEDLINE, Embase, Cochrane, CINAHL) search was run for both published and grey literature between 1946 and February 16th, 2024. We included randomized controlled trials (RCTs) that evaluated psychosocial interventions for children and adolescents (aged ≤ 19 years) with neurodevelopmental disorders, such as autism, intellectual disability, ADHD, and communication or motor disorders. Psycho-pharmacological interventions were excluded. Data screening extraction and risk of bias was done by two independent reviewers.

Results:

We included 9 studies 8 published and one grey literature study with a total number of $N = 325$ participants. Most of the studies ($k=6$) were randomized controlled trials (RCTs), ($k=2$) cluster randomized controlled trials (Cluster RCTs), and ($k=1$) mixed-methods randomized controlled trial. The included studies were from India ($k=1$), Iran ($k=5$), Pakistan ($k=2$), and Tunisia ($k=1$), highlighting six psychosocial interventions tailored to local contexts. Parent skills training programs were among the most frequently evaluated showing reduction in disruptive behaviors and improving caregiver-child interactions. Yoga and music therapy also improved behavioral outcomes and emotional regulation in children with NDDs. Neuro-feedback training and reality therapy demonstrated varying levels of effectiveness, depending on the cultural adaptation of the intervention and the context in which it was implemented.

Conclusions:

This systematic review highlights the potential of culturally adapted evidence-based psychosocial interventions to reduce disruptive behaviors in children and adolescents with NDDs in LLMICs. Future research should prioritize larger trials, sustainability, and the integration of interventions into existing healthcare systems.

422.194 Root Causes of Autism Disproportionality in Special Education: Insights from Two Mixed-Methods Studies in California **P. Luelmo, Special Education, San Diego State University, San Diego, CA**

Background:

Autism disproportionality in special education remains a significant concern, particularly in California, where White students are often overidentified, and Latinx and Indigenous (Zapotec/Mixtec) students are underidentified. These disparities arise from systemic issues, such as cultural misunderstandings, language barriers, and inequitable access to diagnostic services. The underidentification of Latinx and Indigenous students leads to delayed diagnoses and limited access to essential early interventions, which are critical for improving educational outcomes for students on the autism spectrum.

Objectives:

This research aims to investigate the root causes of autism disproportionality by analyzing both systemic and cultural barriers that affect the identification and service provision of students from diverse backgrounds.

Methods:

Two mixed-methods studies were conducted in a California high school district with a history of autism disproportionality. **Study 1 (2021)** involved quantitative analysis through online caregiver surveys ($N=135$), focusing on barriers to autism identification and service access. Participants were asked about their experiences with autism diagnosis, IEP knowledge, and challenges encountered during the identification process. **Study 2 (2023-2024)** utilized qualitative focus groups and interviews with Latinx and Indigenous (Zapotec/Mixtec) caregivers to explore the cultural and linguistic challenges faced by non-English-speaking families. Thematic analysis was employed to identify patterns related to language barriers, cultural stigma, and access to resources.

Results:

Study 1 revealed that White students were slightly overidentified with autism, with some likely needing 504 plans instead of IEPs. In contrast, an estimated 187 Latinx students were underidentified, suggesting that cultural and linguistic barriers played a significant role in delaying diagnosis. These students were often misidentified with other disabilities, potentially due to the absence of early autism screening. The analysis showed that non-English-speaking parents, particularly those from Indigenous backgrounds, faced the greatest challenges, with 68% reporting language as a major barrier to accessing services.

Study 2 provided deeper insights into these barriers. Indigenous families, particularly those who speak Mixtec, scored significantly lower on the IEP Rights Knowledge Scale ($M=3.5$) compared to English-speaking families ($M=7.5$). This gap in knowledge and understanding of the IEP process contributed to the delayed identification of autism. Only 38% of non-English-speaking families received an autism diagnosis for their children before school intervention, compared to 73% of English-speaking families. The qualitative data highlighted that Indigenous families were often unaware of autism or attributed developmental delays to other factors due to a lack of accessible information and cultural stigma surrounding disabilities.

Conclusions:

The findings from both studies emphasize the urgent need for systemic interventions to address autism disproportionality. Early autism screenings, especially in high-risk populations, enhanced translation services, and culturally sensitive training for educators and caregivers are critical to reducing these disparities. Without targeted efforts to support Latinx and Indigenous families, disproportionality in autism identification will continue to disadvantage these communities. Implementing these changes will help ensure equitable access to special education services for all students, particularly those from underserved backgrounds.

422.195 Subjective Wellbeing in Vietnamese Migrant Parents of Autistic Children

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Background:

There are strong evidence of poorer mental health in both migrant parents and parents of autistic children. However, little is known about intersection of these two groups. The wellbeing of migrant parents with autistic children is often overlooked due to lack of culturally and linguistically sensitive studies or instruments.

Objectives:

This study explored the wellbeing of Vietnamese migrant (VM) parents, one of the most vulnerable migrant groups, who were also parents of autistic children. It was hypothesised that VM parents of autistic children would report lower wellbeing than VM parents without autistic children and general population (GP) parents with or without autistic children. The possible contributing factors to VM parents' lower wellbeing will also be explored.

Methods:

The Personal Wellbeing Index (PWI) was translated into Vietnamese and validated for use in a VM sample. We recruited 142 GP and 142 VM parents of autistic or non-autistic children to respond to an anonymous, 15-minute online survey in either Vietnamese or English at their discretion. The participants' wellbeing (PWI), mental health (Depression, Anxiety, and Stress Scale 21), demographic data, years since migration, and English proficiency were recorded.

Results:

Our baseline results indicated that VMs had lower wellbeing than the GP, $t(69,498)=2.25, p=0.02, d=0.02$. Unexpectedly, VM females showed significantly lower wellbeing than their GP counterparts, $t(992)=2.90, p=.004, d=0.18$. Our next phase, to be completed in November and December, will assess the wellbeing of VM parents of autistic children, which is anticipated to be lower than that of their GP counterparts. Their mental health status and demographic data will be used to interpret the results.

Conclusions:

This study is anticipated to provide knowledge about the mental health and wellbeing of VM parents of autistic children and highlight their unmet needs. Key findings may facilitate future support and identify intervention points. This study will encourage future research to uncover further the experiences of migrant parents in Western societies, especially those with neurodivergent children.

422.196 Title: A Cross-Cultural Examination of the Comprehensive Autistic Trait Inventory (CATI) in Two General Population Samples

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Background: The Comprehensive Autistic Trait Inventory (CATI) is a self-report measure of autistic traits in the general population (English et al., 2021). It comprises six subscales: Social Interactions (SOC), Communication (COM), Social Camouflage (CAM), Repetitive Behaviours (REP), Cognitive Rigidity (RIG), and Sensory Sensitivity (SEN). Previous research has indicated cultural differences in the expression and interpretation of autistic traits (Freeth et al., 2013). Additionally, sex differences in autistic traits have been widely reported, with males generally showing higher levels of autistic characteristics (See for example, Greenberg et al., 2018). However, recent research suggests that these may vary across different domains of autistic traits (Mahendiran et al., 2019; Siracusano et al., 2021).

Objectives: This study aimed to compare CATI scores between an English-speaking sample (mostly from Australia and the UK), and a Hebrew speaking Israeli sample, to examine associations between subscales across cultural groups, and to investigate sex differences and age effects on CATI scores.

Methods: 1997 individuals (995 English-speakers, 1002 Israeli) completed the CATI. Correlational analyses and a mixed-design ANOVA were conducted, with subscale as a within-subjects factor, cultural background and sex as between-subjects factors, and age as a covariate.

Results: Correlational analyses revealed varying subscale correlation strength across culture ($r = .29$ to $.44$, all $p < .001$), whereas Total CATI scores were strongly correlated cross-culturally ($r = .73, p < .001$), supporting the need for further analysis. The ANOVA revealed significant main effects for subscale ($F(5,1988)=167.24, p < .001$), with RIG showing the highest mean score ($M = 22.24, SD=7.76$) and COM the lowest ($M=13.90, SD=4.87$); for cultural background ($F(1,1992) = 61.208, p < .001$) with English-speakers scoring higher than Israeli participants; and for sex ($F(1, 1992)=6.34, p=.012$) with males ($M=18.52, SE=.14$) scoring higher than females ($M=18.04, SE=.14$).

In addition, significant interactions were found between subscale and cultural background ($F(5,1988)=39.23, p < .001$) and between subscale and sex ($F(5,1988)=37.76, p < .001$) (Figure 1). These interactions suggest that the pattern of scores across subscales differed by cultural background and by sex. Post-hoc analyses revealed that English-speaking participants scored significantly higher than Israeli participants on SOC (Mean Difference (MD) = 4.47, $SE=.34, p < .001$), COM (MD=1.35, $SE=.22, p < .001$), REP (MD=1.21, $SE=.29, p < .001$), and RIG (MD=1.34, $SE=.27, p < .001$) subscales. Regarding sex differences, males scored higher on COM (MD=1.94, $SE=.21, p < .001$), CAM (MD=0.75, $SE=.27, p=.005$), REP (MD=1.36, $SE=.28, p < .001$), and RIG (MD=.54, $SE=.26, p=.034$), while females scored higher on SEN (MD=1.72, $SE=.29, p < .001$).

Age significantly effected CATI scores ($F(1,1992)=77.49, p < .001$), with a general trend of increasing scores with age across most subscales, particularly the REP, CAM and RIG subscales.

Conclusions: The CATI demonstrates cross-cultural differences in autistic trait profiles, with English-speaking participants generally scoring higher than Hebrew speakers. Sex differences were observed across subscales, highlighting the importance of considering sex in autistic trait assessment.

Age influences CATI scores, suggesting a need for age-specific norms. The CATI shows promise as a cross-cultural measure, though culture-specific cutoffs may be required for screening purposes. These findings contribute to our understanding of the broader autism phenotype across cultures and emphasize the importance of cultural considerations in autistic trait assessment.



422.197 Developing a Globally-Relevant Family Support Programme for Young Autistic Children: Stakeholder Perspectives from South Africa and Russia

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Background:

Recent progress in a range of caregiver education programmes and caregiver-mediated interventions have led to improved outcomes for autistic children and families. However, most of these programmes have come from high-income countries and were not designed from the outset with a focus on global relevance and participatory stakeholder involvement. To address this gap, this international research collaboration set out to develop a new family support programme for families of young autistic children, called "Bloom".

Objectives:

The objective of this study was to investigate the stakeholders' views on the relevance of the proposed programme, the clarity and appropriateness of language used in programme description, and the gaps not addressed in the programme that were important to stakeholders.

Methods:

This study adopted qualitative methodology and used purposive sampling to invite stakeholders from South Africa (SA) and Russia (Rus) to take part in facilitated workshops. The sample ($N_{SA}=14$, $N_{Rus}=17$) comprised of family members of autistic children and adults, self-advocates, professionals and autism non-profit representatives. After providing informed consent, participants attended a presentation explaining Bloom's Theory of Change (Schlebusch et al., 2024) and background, and were divided into groups of 3-5 for facilitated discussions. Using a detailed guide, facilitators guided participants through discussions about language, relevance, needs and gaps. Data were collected using Post-it notes and flipchart paper at the in-person event (SA) and whiteboard feature of the Zoom platform for the online workshop (Rus). Once collated, all data were digitised and uploaded into Miro software, where it was stored and analysed using a six-phase reflexive thematic analysis approach.

Results:

The stakeholder workshops generated large volumes of relevant data with high information power. Unanimously, both stakeholder groups felt that the proposed programme was highly relevant and both groups agreed with the proposed goals and methods. Participants identified a wide range of needs for families new to an autism diagnosis, including autism-specific (knowledge, practical skills, effective tools, positive child development, specialist support), social (social support, inclusion of all family, community) and psychological (self-care skills, hope for brighter future, safe space for practice) needs. Scalability, cost implications, and capacity-building for service provision were amongst some of the themes unique to SA stakeholders. Facilitator needs, such as time for training, local tips and additional materials were unique to Russian stakeholders, reflecting the sample composition of this group where 70% of participants were working directly with autistic children and their families.

Conclusions:

The participatory approach to programme development and continuous engagement with stakeholders from local autism communities are at the core of Bloom programme philosophy. The findings from stakeholder workshops across two different cultural contexts highlighted the need for multi-level support for families post-diagnosis and the high demand for culturally-adaptable evidence-based programmes for families of young autistic children. The implications of this study extend beyond the development of the Bloom family support programme, by offering a detailed account of the methods and procedures used in stakeholder engagement activities that can inform future participatory research in this area.

422.198 Translation and Adaptation of the Executive Functioning Intervention "Unstuck and on Target" for Latin America

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Background: Families of autistic children struggle to access high quality, evidence-based, interventions in Latin America.¹ Through an international partnership between researchers in the U.S. and the Neurodesarrollo Quito (NQ) clinic in Ecuador, we sought to translate, adapt, and collect initial acceptability data from Ecuadorian clinicians and families about the manualized, evidence-based, executive functioning intervention *Unstuck and On Target* (*Unstuck*).² *Unstuck* is a well-suited program for use in low-and-middle income countries because it is cost-effective, easy-to-use, and designed to be run by anyone, including providers that do not have specialized training.

Objectives: To describe the process for translating *Unstuck* and present initial feasibility/ acceptability data on its international use.

Methods: An initial translation of the *Unstuck* manual from English to Spanish was completed by DeepL, an AI program specifically designed for translation. Our team then decided on the best translation of key *Unstuck* scripts/vocabulary to be understood across Latin America. This was done in a collaborative meeting with clinicians interested *Unstuck* from Argentina, Ecuador, Mexico, and Puerto Rico. Currently, the AI translation is being revised by the NQ clinic director and the *Unstuck* research team, making changes both for language clarity and cultural acceptability to create an adapted manual of comparable quality to the version in English (rather than just a direct translation). Even before the intervention was formally translated, NQ clinicians delivered *Unstuck* using informal translations of the lessons to children either individually or in small groups, with separate individual parent training. To date, seven NQ clinicians have used all or part of the program with 11 neurodivergent children and their parents. We collected initial data around feasibility/acceptability from both clinicians (using the AIM/IAM/FIM³) and families (using child and parent satisfaction surveys created by our research team).

Results: On three-point-Likert scales, children rated *Unstuck* highly on how much they enjoyed it ($M = 2.83$, $SD = 0.41$), with slightly lower ratings on how much they felt it helped them at school ($M = 2.67$, $SD = 0.52$), and at home ($M = 2.50$, $SD = 0.55$). Open-ended responses revealed the most helpful parts of the program were *Unstuck* vocabulary and calming strategies, and the biggest suggestion to improve it was to include more games. Across six 5-point Likert scales, parent acceptability ratings ranged from an average of 4.00 (ability to practice skills at home) to 4.71 (overall satisfaction). Open-ended responses similarly identified *Unstuck* scripts and emotion regulation to be the most helpful aspects, while the biggest suggestion was for more resources for parental learning outside of sessions. Finally, implementer ratings were high, with means ranging from 18.40 to 18.80 out of 20 on the acceptability, appropriateness, and feasibility subscales respectively. Implementers identified the clear lesson structure and easy-to-understand concepts as strengths, and greater consideration of local culture/ context to be an area for improvement.

Conclusions: Easy-to-use, manualized, interventions such as *Unstuck* may be feasible/acceptable for use in low-and-middle income countries with relatively minor adaptations. The core content appears relatable across culture, despite needing some smaller modifications to improve contextual fit.

422.199 Well-Being of Parents of Children with Autism: A Cross-Cultural Comparative Study

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Background: Supporting parents of children with autism spectrum disorder (ASD) and helping them adjust to their child's condition is a core clinical and scientific necessity, as emphasized by the French National Strategy for Autism (2023). The literature highlights that ASD significantly influences parental well-being, and this impact can vary depending on cultural context. Although ASD is a priority in public health policies in various countries, few cross-cultural studies have compared the experiences of parents of children with ASD. Studies highlighted that in order to effectively design and tailor early interventions for all families of children with ASD, it is essential to study and compare the experiences of parents from both individualistic and collectivistic cultures.

Objectives: This cross-cultural comparative study aims to investigate the well-being of French, Canadian and Lebanese parents of children with ASD including parental anxiety, depression, and the quality of life in parents of children with autism, as well as the explicit individual, psychosocial and cultural factors of parental well-being.

Methods: Participants included 59 French, 39 Canadian, and 38 Lebanese parents of children with ASD. They completed completed self-evaluation measures assessing parental anxiety and depressive symptoms, quality of life, coping strategies, emotional regulation strategies, internalized stigma, perceived stress and social support, the severity of the child's problem and emotional behaviors, as well as motor coordination deficits in children with ASD. A sociodemographic questionnaire provided additional information about the participants and their children.

Results: Lebanese parents in our sample exhibited higher scores of anxiety and depression in comparison with Canadian and French parents of children with ASD. However, Lebanese parents also reported better physical health and environmental scores than their Canadian and French counterparts. Cognitive reappraisal predicted higher anxiety in French and Canadian parents, while Lebanese parents showed no significant predictors for anxiety. Depression was linked to lower cognitive reframing for Canadian and French parents, and to decreased distraction coping in Lebanese parents. Quality of life also varied by culture, with Canadian parents benefiting from cognitive reframing and Lebanese parents showing better outcomes with distraction coping. Additionally, lower child behavioral issues improved environmental quality of life for Lebanese parents.

Conclusions: This study underlined both similar and distinct factors of anxiety, depression, and quality of life across French, Lebanese, and Canadian parents of children with ASD, suggesting clear cross-cultural differences. Clinicians should implement culturally tailored interventions that enhance coping strategies. Additionally, providing training in emotional regulation, fostering community support, and addressing child behavioral issues through parent training programs will promote parental well-being associated with raising children with ASD. Further qualitative research is important, as it can provide deeper insights into the experiences and challenges faced by parents across different cultural contexts.

**422.200 Why We Must Act: Barriers to Autism Care**

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Background:

Barriers to autism care are well-documented, but understanding the specific obstacles faced by professionals in different regions is crucial for developing effective solutions. To gain insight into these challenges, we conducted research focusing on the barriers encountered by participants in our autism care programs across North, Central, and South America. In 2023, we introduced a standardized metric for evaluating programs to more systematically assess and address these barriers.

Objectives:

- To identify and compare the key barriers to autism care faced by professionals across the Americas.
- To assess the severity of these barriers between regions.
- To compare barriers across regions

Methods:

Data were collected from participants in the ECHO Autism programs between 2023 and 2024, utilizing a newly implemented standardized metric. Surveys gathered demographic information, levels of self-efficacy, perceived barriers to care, and changes in clinical practice. The data were then aggregated and compared across regions, specifically focusing on the differences between Latin America (LATAM, n=108) and the United States (US, n=116). Comparative analysis was conducted to assess the top barriers and the reported severity of these obstacles.

Results:

The top barriers identified by LATAM participants were: lack of public policy supporting autism care, high cost of training opportunities, and insufficient or no financial reimbursement for professional services. In contrast, U.S. participants reported inadequate access to autism supports and services outside of their profession, limited ability to connect with autism specialists, and lack of training as the primary barriers. Overall, LATAM participants indicated that all barriers were more severe than those reported by U.S. participants. Additionally, U.S. participants experienced a more significant decrease in the severity of barriers over time compared to LATAM participants, indicating regional differences in both the nature and the persistence of these obstacles.

Conclusions:

This research highlights the significant disparities in the barriers faced by professionals across different regions. In Latin America, systemic challenges such as insufficient public policy and financial constraints are more pronounced, whereas in the U.S., the focus is on improving access to specialized services and training. Addressing these regional differences is critical for developing targeted interventions to reduce barriers and improve access to autism care globally. Our findings emphasize the need for continued efforts to create more equitable care systems and support professionals through policy reform, accessible training, and financial reimbursement strategies.

422.201 Latino Voices in Autism Research: A Community-Based Approach to Cultural and Linguistic Inclusion

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Background: Despite an increased prevalence within the U.S., Black, Indigenous, and other people of color (BIPOC) and those of lower socioeconomic status (SES) they have been historically underrepresented in autism research. Specifically, Latino autistic individuals and their families are significantly underrepresented, limiting the capacity for researchers to generate findings that benefit this community. In addition, Latino parents of autistic children report higher distrust towards healthcare systems and needing twice the amount of physician visits to receive an ASD diagnosis than White non-Latino parents. As a result, the partnerships between researchers and the community of Latino parents of autistic children are scarce, influencing their participation in research studies

Objectives: Our project aimed to (1) establish a partnership between researchers and the Latino autism community in the Rio Grande Valley, Texas, and (2) identify and integrate cultural considerations to adapt the entirety of participants' research experience, from participant recruitment to the development of measurement tools.

Methods: Using a phenomenological framework grounded in Community-Based Participatory Research (CBPR) and principles from the social model of disability, this study conducted five focus groups between March and May 2023. Three focus groups included parents of autistic children (n=25), while two involved autistic adults (n=8). A script, informed by previous studies, guided the discussions, focusing on recruitment materials (e.g., flyers, emails, phone scripts) and procedures (e.g., number of sessions, locations, transportation). Applied thematic analysis was used to evaluate the cultural and linguistic appropriateness of the research materials and recruitment strategies. This work served as a foundation for a broader study examining the impact of bilingualism on language development in autistic children.

Results: Four main themes emerged from the data, reflecting research involvement, symbols as representations of autistic identity, distrust toward the research team, and the importance of cultural and linguistic alignment. One recurrent theme among parents was the preference for identity-first versus person-first language, while this was not as prominent for autistic adults. Additionally, the participants highlighted the use of symbols to represent different community groups. They provided valuable feedback on logistical aspects, such as the ideal length of assessment sessions, appropriate locations, types of prizes for children, and how to navigate the assessment process. Importantly, participants emphasized that knowing their involvement would contribute to scientific advancement was a primary motivation for participation

Conclusions: This study highlights the critical need to include historically marginalized populations in autism research as a step toward reducing health disparities. The results show that the Latino autism community is willing to participate in research, provided that recruitment efforts and study designs are culturally and linguistically sensitive, identify the responsible parties (principal investigators and institutions), and offer benefits beyond monetary compensation. By employing a CBPR framework and incorporating an intersectionality lens, researchers can build trust with the Latino autism community, amplifying their historically unheard voices. This approach moves us closer to achieving more equitable representation in autism research and to developing methods that address the needs of a diverse autistic population in culturally informed ways.

422.202 Transborder Solutions: Empowering Latino Caregivers of Autistic Children Along the US-Mexico Border

C. Montiel-Nava¹, M. Ortiz², A. C. Ramirez¹, M. Montenegro³, G. Matheus⁴, B. Villalobos⁵, R. Calderon⁶, S. Perez⁷ and M. Mares⁸, (1)Department of Psychological Science, University of Texas Rio Grande Valley, Edinburg, TX, (2)Psychology, University of Texas Rio Grande Valley, Edinburg, TX, (3)University of Texas Rio Grande Valley, Edinburg, TX, (4)The University of Texas Rio Grande Valley, Edinburg, TX, (5)California State University, Northridge, Northridge, CA, (6)Department of Human Development and School Services (HDSS), University of Texas Rio Grande Valley, Edinburg, TX, (7)Autismo en mi Vida Rio Grande Valley, Edinburg, TX, (8)United Way of South Texas, McAllen, TX

Background: Autistic children living near the US-Mexico border face significant challenges in accessing autism-related health services. Barriers such as language, costs, late diagnosis, long waiting lists, and lack of providers exacerbate negative outcomes. Many border residents seek healthcare across the border due to lower costs, accessibility, and perceived effectiveness. Culturally and linguistically sensitive interventions are critical in addressing health disparities within the Latino community and in facilitating transnational healthcare for this vulnerable population.

Objectives: This study examined the acceptability and feasibility of the World Health Organization's Caregiver Skills Training (CST) program for Spanish-speaking caregivers of autistic children along the US-Mexico Border.

Methods: Caregivers of 10 Spanish-speaking autistic children aged 3-5 years (mean age = 3.85, SD = 0.88) from the Rio Grande Valley completed the WHO-CST program. All caregivers identified as Latino; most were mothers (90%, n=9) and bilingual in Spanish and English (90%, n=9).

Twenty percent (n=2) were Mexican residents who crossed the border to attend sessions. Eighty percent (n=8) of the children were male, and 60% (n=6) primarily spoke Spanish.

Data were collected at two points: program onset and 12 weeks post-completion after the final home visit. Measures included the Autism Treatment and Evaluation Checklist (ATEC), Parental Stress Scale, Parental Sense of Competency Scale, and Caregiver Knowledge and Skills Test.

Feasibility and acceptability data were gathered via post-session feedback.

Results: ATEC scores showed a decrease from 72.70 (SD = 11.53) to 69.70 (SD = 10.95), indicating a reduction in autism-related characteristics, though the change was not statistically significant. However, health/physical subdomain scores showed a significant reduction from 23.40 (SD = 7.95) to 20.30 (SD = 9.14) ($t = 2.96$, $p = .02$). Other domains—communication, sociability, sensory/cognitive—also showed decreased symptomatology but without statistical significance. Caregiver knowledge improved significantly ($t = 9.13$, $p = .003$). Parental stress and sense of competence both decreased, though not significantly.

Caregivers overwhelmingly found the sessions easy to understand (100%), relevant to their families' needs (99%), and helpful in achieving goals (97%). Most felt the session duration was appropriate (96%) and that they were prepared to implement the CST strategies at home (89%).

Conclusions: ATEC scores showed a decrease from 72.70 (SD = 11.53) to 69.70 (SD = 10.95), indicating a reduction in autism-related characteristics, though the change was not statistically significant. However, health/physical subdomain scores showed a significant reduction from 23.40 (SD = 7.95) to 20.30 (SD = 9.14) ($t = 2.96$, $p = .02$). Other domains—communication, sociability, sensory/cognitive—also showed decreased symptomatology but without statistical significance. Caregiver knowledge improved significantly ($t = 9.13$, $p = .003$). Parental stress and sense of competence both decreased, though not significantly.

Caregivers overwhelmingly found the sessions easy to understand (100%), relevant to their families' needs (99%), and helpful in achieving goals (97%). Most felt the session duration was appropriate (96%) and that they were prepared to implement the CST strategies at home (89%).

Poster Session

423 - Interventions - Biomedical I

May 2nd, 2025, 12:30 PM - 1:30 PM - Hall 4A

423.203 A Novel Synbiotic Formula for Anxiety and Sensory Hyper-Responsiveness Symptoms in Young Autistic Children: An Open-Labelled Pilot Study

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Background: Recent advancements in understanding the microbiota-gut-brain axis (MGB) have posited microbial modulation as a novel intervention strategy in autism. However, prior trials of probiotics were not informed by the complex interactions between the MBG axis and clinical phenotypes, leading to a lack of targeted treatment outcomes. Our upstream research revealed the correlations between depleted gut microbial production of GABA and elevated sensory hyperresponsiveness and anxiety symptoms in autism. A novel synbiotic formula, SCM06, with a combination of prebiotics and probiotic species that upregulate GABA production and immune function, was developed as a specific treatment of anxiety and sensory symptoms in young autistic children.

Objectives: This study aimed to assess the safety, tolerability, and preliminary efficacy of the SCM06 formula in alleviating anxiety and sensory hyperresponsiveness symptoms in young autistic children.

Methods: Young autistic children with significant anxiety and sensory hyperresponsiveness symptoms were recruited in this open-label pilot study from a Child and Adolescent Psychiatric Center affiliated with a University Teaching Hospital in Hong Kong (ClinicalTrials.gov ID: NCT06126185). Participants consumed one sachet of the SCM06 formula daily for 12 weeks. Anxiety, sensory hyper-responsiveness, core autistic symptoms, attention deficit and hyperactivity disorder (ADHD) and externalizing behavioural symptoms, and presence of functional gastrointestinal disorders (FGID) were evaluated at Weeks 0, 6, and 12 using the following parent-rated questionnaires: Anxiety Scale for Children-Autism Spectrum Disorder scale (ASC-ASD), the Sensory Experience Questionnaire (SEQ), Social Responsiveness Scale 2nd edition, Child Behavioural Checklist and Rome IV Diagnostic Questionnaires for Pediatric FGID.

Results: A group of thirty prepubertal ASD children with normal IQ, aged 4 to 11 (22 males and 4 females) were recruited and completed the study. SCM06 was safe and tolerable, with only 3.33% and 6.67% of participants reporting self-limiting loose stool and reduced appetite. Significant improvements from Week 0 to Week 12 were observed in both anxiety ($F = 7.47$, $df = 2,58$, $p = 0.001$, $\eta_p^2 = 0.205$) and sensory hyperresponsiveness ($F = 3.87$, $df = 2,58$, $p = 0.026$, $\eta_p^2 = 0.118$) (Figure 1). The prevalence of functional abdominal pain disorders decreased from 26.7% at Week 0 to 10.0% at Week 12 ($\chi^2 = 5.00$, $df = 1$, $p = 0.025$). Other symptoms such as ADHD and core ASD features, which were not associated with depleted gut microbial GABA production, did not change significantly. This suggested a specific effect of SCM06 on the two targeted symptom domains.

Conclusions: The concurrent relief of gastrointestinal, sensory, and anxiety symptoms corroborated with our upstream observational studies, alluding to the specific therapeutic action of SCM06 on the MBG axis. Nevertheless, an adequately powered RCT is needed to evaluate SCM06's efficacy properly.



423.206 Predictors of Placebo Response in the Study of Oxytocin in Autism to Improve Reciprocal Social Behaviors (SOARS-B)

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Background: Although randomized clinical trials (RCTs) have sought to identify treatments for social communication difficulties and repetitive behaviors in autism, none has yet shown consistent superiority over placebo. In part this may be because the substantial placebo response reported in many autism RCTs impedes the ability to detect meaningful treatment effects. Meta-analyses have identified trial-level factors that predict an increased placebo response rate in autism, including longer trial duration and larger sample size, but only two studies of individual-level factors have been conducted to date. These studies found that lower baseline symptom severity and enrollment at a commercial rather than academic study site may make a particular autistic individual more likely to respond to placebo. However, little is known about what other factors might be influential in predicting individual-level placebo response.

Objectives: We sought to identify individual-level predictors of placebo response in data from SOARS-B, a 24-week RCT of intranasal oxytocin for social impairment in autistic youth. In our primary analysis, we examined predictors of change in Aberrant Behavioral Checklist-modified Social Withdrawal (ABC-mSW) score, a caregiver-rated index of social impairment, at 24 weeks in SOARS-B participants taking placebo. In secondary analyses, we examined predictors of ABC-mSW change at 12 weeks and predictors of Clinical Global Impression – Improvement (CGI-I), a clinician-rated index of clinical improvement or its lack relative to baseline, at 24 and 12 weeks. For comparison, we also examined predictors of ABC-mSW change and CGI-I at 24 and 12 weeks among SOARS-B participants taking oxytocin.

Methods: For each analysis, we first used lasso regression to identify potentially influential predictors from among a large group that included demographic factors, rating scale data, study site, and prescribed medications. We then estimated an unpenalized linear regression model for the outcome of interest that included only those variables retained by the optimal lasso. We considered any variables with statistically significant coefficients to be influential predictors.

Results: We found that a higher baseline ABC-mSW score was the only influential predictor of ABC-mSW change in the placebo group at 24 and at 12 weeks. Regarding CGI-I, we found no influential predictors at 24 weeks, but at 12 weeks found that age, IQ and study site were influential. In our comparative analysis, we found that ABC-mSW was also an influential predictor of ABC-mSW change at 24 and 12 weeks in the oxytocin group. Predictors of CGI-I, however, were inconsistent with those in the placebo group, suggesting that random variability explained the observed effects.

Conclusions: In this analysis of SOARS-B data, higher baseline severity on an index of social impairment (the ABC-mSW) predicted greater placebo response. This contrasts with a prior analysis of data from a trial of citalopram for repetitive behaviors in autism, in which lower baseline severity of a composite measure that included core autism features and mood symptoms predicted greater placebo response. This may indicate that different factors contribute to placebo response in different symptom domains. Further analyses of individual-level RCT data are necessary to better understand predictors of placebo response in autism.

423.207 Psychoactive Medication Use and Polypharmacy Among Children with Autism Spectrum Disorder in New Jersey: A Population-Based Study

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Background: While there are no pharmacological treatments for the core symptoms of Autism Spectrum Disorder (ASD), psychoactive drugs are commonly used to manage associated symptoms or comorbid conditions. Two antipsychotic medications, risperidone and aripiprazole, are FDA-approved to treat maladaptive behaviors such as irritability and aggression in individuals with ASD. Other psychoactive drugs are frequently used to address additional psychiatric comorbidities. However, most previous studies on psychoactive medication use in children with ASD have relied on convenience samples or administrative data, which may introduce bias or limit generalizability.

Objectives: This study aims to estimate the proportion of children with ASD who are prescribed psychoactive drugs, assess polypharmacy rates, and examine whether psychoactive drug use varies by sex, race/ethnicity, and socioeconomic status (SES) in a large, diverse population.

Methods: Data were obtained from the New Jersey Autism Study (NJAS), part of the Autism and Developmental Disabilities Monitoring (ADDM) Network, which conducts population-based ASD surveillance. The findings represent children (age 8-years) born in 2012 and identified with ASD in study year 2020, residing in Essex and Union Counties. ASD cases were identified through active, multi-source review and analysis of health and education data. Information on prescribed psychoactive medications was collected from these records, along with demographic and case-specific data. The Social Vulnerability Index (SVI) was used as an additional measure of socioeconomic status (SES). Chi-square tests were used to test associations.

Results: The study identified 544 children with ASD, yielding an estimated prevalence of 28.7 per 1,000 (95% CI: 26.4-31.2) for the 2020 surveillance cycle. Among these, 137 (25%) had indication of receipt of psychoactive drugs and 91 (17%) had indication of multiple psychoactive drugs (polypharmacy). Medications targeting ADHD symptoms, including both stimulants and non-stimulants, were the most commonly prescribed (91%), with non-stimulants used most frequently (67%) followed by stimulants (55%). Antipsychotics (26%) and anti-seizure medications (13%) were the next most frequently used categories. Psychoactive medication use differed significantly by race/ethnicity, with 43% of children receiving pharmacotherapy being Hispanic, 30% Black, 18% White, and 9% from other racial/ethnic groups ($p=.01$). This variation was driven largely by ADHD medications, where 44% of children prescribed these medications were Hispanic, compared to 27% Black, 19% White, and 10% from other racial/ethnic groups ($p=.01$). Antipsychotic use was significantly associated with higher social vulnerability, with 83% of children prescribed antipsychotics falling into the high-vulnerability category ($p=.04$). There were no significant differences by sex. In cases of polypharmacy, the number of medications used ranged from 2 to 9, spanning 1 to 6 different drug categories.

Conclusions: Approximately 1 in 4 8-year-old children with ASD in metropolitan New Jersey are prescribed psychoactive medications, with two-thirds of these children receiving multiple medications. These findings align with other studies showing an increase in psychoactive drug prescriptions for children with ASD. The high rate of polypharmacy may indicate a greater prevalence of comorbid conditions among children with ASD. Further research is necessary to understand the long-term effects of psychoactive medications on individuals with ASD.

**423.208 Randomized Placebo-Controlled Crossover Trial of Diphenhydramine for Sleep in Youth with Autism**

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Background: Disrupted sleep is one of the most burdensome symptoms reported by parents of children and adolescents with autism spectrum disorder (ASD). Pharmacological treatments targeting specific neurotransmitters and/or hormones are available to better regulate sleep, but there is a lack of investigations assessing the biological effects of these agents in ASD. Diphenhydramine is an over the counter, FDA approved treatment of insomnia for children aged 12 years and older. It is an ethanolamine and first-generation H1 antagonist that acts as a reversible, competitive inhibitor of histamine binding to the H1 receptor. H1 antagonists, especially ethanolamine, have significant antihistaminic and antimuscarinic activities and concurrent sedative properties. The efficacy of diphenhydramine on sleep has been investigated in several studies of children and adults with a wide range of psychopathology, but is yet to be systematically investigated in individuals with ASD.

Objectives: The aim of this study was to examine the efficacy of diphenhydramine for improving sleep difficulties in children and adolescents (age 8-17 years) with ASD and examine target engagement as measured by standardized questionnaires, polysomnography (PSG) and actigraphy.

Methods: In an ongoing randomized double-blind crossover placebo-controlled 8-week trial (Autism Centre of Excellence for sleep), seven male children with ASD (8-17 years) have completed all assessments so far. Diagnosis of ASD was confirmed using the Autism Diagnostic Observation Schedule and the Autism Diagnostic Interview-Revised. Children were included if they had a baseline Children's Sleep Habits Questionnaire (CSHQ) score of ≥ 41 and had completed at least one night of PSG. Participants had a starting dose of 25mg which was titrated to 50mg in week 2 of each arm if there were no significant improvements in sleep and no adverse events. The CSHQ and one night of PSG were collected at week 4 (end of treatment arm 1) and week 8 (end of treatment arm 2). Actigraphy (at least one week) was recorded at baseline, week 4, and week 8.

Results: Linear mixed effect modeling was used to estimate mean differences between study groups (placebo versus active) utilizing all repeated measures (baseline, week 4 and week 8). For CSHQ variables, statistically significant intervention effects were found for both the sleep onset delay (Placebo mean = 1.87 [95% CI 1.43, 2.31]; Active mean = 1.13 [95% CI 0.69, 1.57]) and sleep duration (Placebo mean = 5.59 [95% CI 4.52, 6.65]; Active mean = 3.42 [95% CI 2.35, 4.48]) subscales. No other statistically significant intervention effects were found on other CSHQ subscales. In contrast, no statistically significant effects were detected for sleep efficiency and sleep onset latency assessed via PSG ($p > .05$). Analysis of actigraphy data is ongoing.

Conclusions: While anti-histamines are common over-the-counter medications for treating sleep problems in youth, their effectiveness for treating sleep problems in children and young people with ASD is unknown. Our preliminary results from this ongoing trial are promising, suggesting positive results for diphenhydramine on parent-reported sleep parameters. Further analyses with a larger sample size of participants who complete the trial will confirm these preliminary findings.

423.209 Role of Gluten-Free-Casein-Free (GFCF) Diet in Children with Autism Spectrum Disorder: A Randomized Controlled Trial
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Background: Gluten-free casein-free (GFCF) diet is believed to work through the gut-brain axis by reducing the impact of peptides on neurochemical pathways. Although several studies suggest that GFCF diet may improve behavior in children with Autism Spectrum Disorder (ASD), conclusive evidence remains insufficient.

Objectives:

To evaluate the efficacy of add on GFCF diet compared to standard treatment in improving the core symptoms of ASD.

Methods:

In this single-blinded (assessor), randomized controlled trial, children aged 3-12 years fulfilling Diagnostic and Statistical Manual of Mental Disorders-5th edition, for ASD were screened and those on standard treatment for atleast 12 weeks were included. Children on standard treatment for ≥ 12 weeks, those who received alternate therapy, with chronic systemic illness and allergic to dietary components were excluded. Control group included children with a similar profile on standard treatment. GFCF diet was given for 24 weeks. Childhood autism rating scale (CARS-2), Applied Behaviour Checklist (ABC), Child Behaviour Checklist (CBCL), Children's Sleep Habits Questionnaire (CSHQ), Development Quotient (DQ) were assessed on baseline and 24-weeks. Resting state functional MRI (fMRI) and structural imaging data were acquired in 15 children in each group at baseline and at 24 $\pm$ 2 weeks on a 3T scanner (Ingenia 3.0T M/s. Philips Medical Systems, Netherlands) with a 32-channel head coil.

Results:

Total of 104 children were enrolled [54-Diet group (83% males); 50-control group (86% males)]. Five children were lost to follow-up in diet group. Mean ($\pm$ SD) age was 68.2 $\pm$ 29.6 and 67.1 $\pm$ 29.7 months in diet and control group respectively. The baseline average CARS-2, ABC and CSHQ score in the diet group was 35.66 $\pm$ 3.62, 74.75 $\pm$ 13.0 and 21(8-33) whereas in the control group was 35.25 $\pm$ 3.5, 77.12 $\pm$ 11.67 and 26(10-35) [P $\geq$ 0.05]. On CBCL at baseline, hyperactivity, attention problems and sleep issues in diet group vs control group were seen in 17/54 (31.5%) [32/54(59.2%), 5/54(9%) and 19/50(38%),27/50(54%) ,7/50(14%)[P>0.05] respectively. Intellectual disability (DQ<70) was seen in 47/54(87%) in diet and 43/50(86%) in control group.

At 24 weeks, per protocol analysis showed average CARS-2, ABC, and CSHQ scores of 32.72 $\pm$ 2.76, 66.38 $\pm$ 11.92, and 10(5-25) in the diet group, and 34.33 $\pm$ 3.3, 71.26 $\pm$ 9.9, and 25(7-31) in the control group (P=0.009, 0.029, 0.012) respectively. Additionally, 7/49 (14.2%) in the diet group and 2/50 (4%) in the control group achieved remission (CARS<30) [P=0.04]. In diet group, 9/49(18.3%) children in comparison with 2/50 (4%) in control group showed clinically meaningful change in CARS (defined as ≥ 4.5 point change) at follow-up [P=0.023]. At 24 weeks, hyperactivity, attention problems, and sleep issues in the diet group versus the control group were observed in 13/49 (26.5%), 12/49 (24.4%), 0/49, and 20/50 (40%), 20/50 (40%), 7/50 (14%) respectively [P=0.08, P=0.05, P<0.01].

On Intention-To-Treat Analysis, average CARS-2, ABC, and CSHQ scores of 32.99 $\pm$ 3.2, 67.2 $\pm$ 12.53, and 13.5(5-25) in the diet group were seen (P=0.03, 0.07, 0.04) respectively. No adverse events were reported. The data for fMRI is under process and the results will be analysed shortly.

Conclusions:

The study shows promising results of gluten and casein elimination from diet in children with ASD showing significant improvement in behavioural profile and sleep issues.

423.210 Risperidone for the Treatment of Autism Spectrum Disorder: A Systematic Review and Meta-Analysis of Efficacy and Safety

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Background:

Autism Spectrum Disorder (ASD) is a complex neurodevelopmental condition characterized by difficulties in communication, social interaction, and behavior. Risperidone, an atypical antipsychotic, is one of the few FDA-approved medications for managing irritability and challenging behaviors in individuals with ASD. This systematic review and meta-analysis aim to evaluate the efficacy and safety of risperidone in the treatment of ASD

Objectives:

To systematically analyze the current evidence on the effectiveness and safety of risperidone in managing core and associated symptoms of ASD

Methods:

A comprehensive literature search was conducted in PubMed, Cochrane Library, Scopus, and Web of Science, up to September 2024. Randomized controlled trials (RCTs) comparing risperidone with placebo or other interventions for treating ASD were included. The primary outcomes assessed were irritability and behavioral improvement, measured by scales such as the Aberrant Behavior Checklist-Irritability Subscale (ABC-I) and Clinical Global Impressions (CGI). Secondary outcomes included changes in social functioning, repetitive behaviors, and adverse events. A random-effects model was used to pool data, and the results were expressed as mean differences (MD) and risk ratios (RR) with 95% confidence intervals (CI).

Results:

A total of 8 RCTs involving 1,032 participants were included. Risperidone demonstrated a significant reduction in irritability scores compared to placebo (MD = -8.95, 95% CI: -10.30 to -7.60, p < 0.001). Behavioral improvement, as measured by CGI, was also significantly greater in the risperidone group (RR = 2.10, 95% CI: 1.50 to 2.80, p < 0.001). However, risperidone use was associated with increased risks of weight gain and sedation (RR = 3.85, 95% CI: 2.10 to 5.60, p < 0.001).

Conclusions: Risperidone is effective in reducing irritability and improving behavior in individuals with ASD. However, clinicians should carefully weigh its benefits against potential side effects such as weight gain and sedation. Further long-term studies are warranted to assess its prolonged safety profile.

423.211 Aripiprazole in the Treatment of Autism Spectrum Disorder: A Systematic Review and Meta-Analysis of Efficacy and Safety**I. Serag**, Faculty Of Medicine Mansoura University, Mansoura, Dakahlia, Egypt

Background: Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder characterized by persistent deficits in social communication and restricted, repetitive behaviors. Pharmacological treatment options are limited, and antipsychotics such as aripiprazole are commonly used to manage associated symptoms like irritability, hyperactivity, and repetitive behaviors. This systematic review and meta-analysis aimed to evaluate the efficacy and safety of aripiprazole in the treatment of ASD.

Objectives: To systematically review and quantitatively synthesize evidence from randomized controlled trials (RCTs) assessing the effects of aripiprazole on core and associated symptoms of ASD in children and adolescents.

Methods: We conducted a comprehensive search of PubMed, Cochrane Library, Scopus, and Web of Science databases up to September 2024. Eligible studies included RCTs comparing aripiprazole with placebo in participants diagnosed with ASD. The primary outcome was the reduction in irritability, measured by the Aberrant Behavior Checklist (ABC-I). Secondary outcomes included changes in hyperactivity, stereotypic behavior, and overall clinical improvement. Safety outcomes, including adverse events, were also analyzed. A random-effects model was used to calculate pooled effect sizes, expressed as mean differences (MD) for continuous outcomes and risk ratios (RR) for dichotomous outcomes.

Results: A total of 8 RCTs involving 1,247 participants were included. Aripiprazole was significantly more effective than placebo in reducing irritability (MD = -8.34, 95% CI: -9.12 to -7.56, $p < 0.001$) and hyperactivity (MD = -4.75, 95% CI: -5.32 to -4.18, $p < 0.001$). However, adverse events such as weight gain and sedation were significantly more common in the aripiprazole group (RR = 1.84, 95% CI: 1.56 to 2.11, $p < 0.001$).

Conclusions: Aripiprazole is effective in reducing irritability and hyperactivity in children with ASD, but its use is associated with increased risk of adverse events. Clinicians should weigh the benefits against potential side effects when prescribing aripiprazole for ASD.

Poster Session**424 - Interventions - Social, Cognitive, Behavioral and Educational - School-Age, Adolescent, Adult II**

May 2nd, 2025, 12:30 PM - 1:30 PM - Hall 4A

424.212 Impact of a Culturally Adapted and Translated Intervention Program on the Mental Health of Autistic Latino Young Adults

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Background: The transition to adulthood for autistic young adults can be complex and challenging, as it often involves navigating changes in education, employment, independent living, and social relationships. This transition is even more complex for autistic Latinos, as they may encounter additional barriers related to cultural differences, socioeconomic challenges, and a lack of culturally and linguistically appropriate therapy to manage co-occurring mental health difficulties. The neurodiversity-affirming, culturally and linguistically adapted *¡Iniciando! la Aduldez* therapy program is tailored for Latino autistic individuals. *¡Iniciando! la Aduldez* not only helps develop skills in social cognition and executive functioning but also provides key skills to manage mental health.

Objectives: The purpose of the present study was to evaluate changes in the mental health of autistic Latino young adults participating in the *¡Iniciando! la Aduldez* program.

Methods: A total of 26 autistic Latino young adults (ages 18-25) and their parents ($n=38$) participated in *¡Iniciando! la Aduldez*, a 12-week intervention program which consists of telehealth-group therapy sessions for both parents and young adults, weekly coaching therapy sessions to work on goals and family therapy sessions. The mental health of autistic young adults was assessed by the Adult Self Report (ASR) questionnaire and the Adult Behavior Checklist (ABCL) at baseline and post-treatment. A paired sample t-test was conducted to examine changes in both measures.

Results: Findings revealed significant improvements in several areas on the ASR. Notably, participants reported reduced anxiety and depression symptoms and thought problems with large effect sizes ($d = 0.77-0.99$). Significant reductions were also observed in attention problems ($d = 0.49$) and sluggish cognitive tempo problems ($d = 0.69$). There were significant decreases in overall internalizing problems ($d = 0.48$) and total problems ($d = 0.52$). On the ABCL, parents reported significant reductions in anxiety and depression problems ($d = 0.58$), somatic complaints ($d = 0.53$), thought problems ($d = 0.77$), and attention problems ($d = 0.60$). Similarly to young adults, parents reported significant decreases in depression problems ($d = 0.70$), anxiety problems ($d = 0.51$), avoidant behavior ($d = 0.65$), ADHD symptoms ($d = 0.53$), and hyperactivity impulsivity symptoms ($d = 0.91$). Additionally, parents reported significant decreases in sluggish cognitive tempo ($d = 0.65$) and obsessive-compulsive problems ($d = 0.67$).

Conclusions: Culturally sensitive and affirming interventions that support a successful transition to adulthood and independence for autistic individuals not only address immediate needs but also have the potential to significantly enhance overall well-being in important areas of co-occurring mental health. By aligning interventions with the individual's cultural values and neurodivergent identity, these programs foster a sense of belonging, self-confidence, and empowerment, which are deeply connected to improved mental health and life satisfaction.

424.213 Impact of a Supportive STEM-Focused Pre-College Internship on Autistic Adolescents and Their Mentors

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Background: [Program blinded], a multi-institution collaboration between [blinded], was developed to provide a pathway to STEM employment for autistic learners. [Program] provides authentic experiences to neurodiverse youth, including a high school internship program wherein select students from across the US are paired with Subject Matter Experts (SMEs) based on their skills and interests. Key components of this program to ensure success include a neurodiversity-affirming approach to mentor training and onboarding, consistent ongoing support for intern/mentor pairs, and individualized check-ins.

Objectives: To assess the success of our program model and prepare for iteration, we investigated interns' STEM Identity, STEM, research, socioemotional, and executive functioning skills, and SME mentor feedback on program structure and support through external evaluation.

Methods: A mixed-methods survey was administered and completed by all 21 interns and mentors from the 2024 cohort. Surveys included a single-item pictorial measure for assessing STEM identity, the STEM Professional Identity Overlap (STEM PIO) and a series of Likert scale questions to retrospectively assess skill gains in key areas.

Results: Analysis of STEM PIO responses indicate that interns' STEM identity after the internship ($M = 4.8$, $SD = 1.4$) was significantly greater than before ($M = 3.3$, $SD = 1.3$), $t(19) = 8.8$, $p < .01$ with a Cohen's d effect size of 0.68.

Retrospective responses measuring growth in research, socioemotional, and executive functioning skills showed that interns reported a statistically significant increase in their confidence on all assessed STEM research skills and all eight assessed executive functioning and socioemotional skills (Table 1). Interns felt more confident in their ability to be polite and kind to peers, use their time effectively, organize information, track progress towards goals, and communicate information clearly, concisely, and logically.

SMEs were asked how satisfied they were with the initial welcome meeting with mentees, their family, and staff. Almost all were very or extremely satisfied with the ongoing support from the staff (94%) and the internship matching process (95%). Similarly, all SMEs were very or extremely satisfied with the program onboarding process and 94% with the training webinar. Almost all mentors felt the program prepared them for their role as a mentor moderately (33%) or greatly (56%) (Figure 1a).

Similarly, most SMEs felt the program moderately or greatly changed how they engaged with neurodiverse individuals (61%) and increased their capacity to work with neurodiverse individuals (78%, Figure 1b).

Conclusions: These findings demonstrate how a pre-college internship program rooted in allowing autistic students to deepen their existing interests and knowledge helps interns to achieve both STEM and executive functioning skills, that are key components of success in post-secondary and workplace settings. Programmatic effects on SMEs also illustrate how neurodiversity-affirming training and support led to a more intentional and inclusive mentorship experience for our autistic youth.



424.214 Implementation of Classroom Pivotal Response Teaching (CPRT) for Autistic Students in India

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Background: India, home to 430 million children, has an autism prevalence of 1 in every 68 children aged 2 to 9 years. The school, where children spend between 800 to 1000 hours annually, is an accessible setting for sustained autism intervention delivery at scale. However, autistic students in India often lack access to evidence-based practices in school. Classroom Pivotal Response Teaching (CPRT) is an evidence-based teaching framework for autistic students. Research has demonstrated that teachers can be trained to implement CPRT with high fidelity, producing greater gains on students' focal IEP goals in comparison to students not receiving CPRT. Specifically, CPRT has been shown to help students learn new language, social, play, and academic skills. Additionally, CPRT training for teachers has predicted improved student engagement and decreased withdrawal behaviors.

Objectives: the goals of this study were to evaluate the acceptability, feasibility, and implementation fidelity of CPRT in a special education school in Bangalore, India. The study sought to answer the following research questions:

1. Can teachers in India achieve and maintain CPRT fidelity?
2. What are the barriers to CPRT implementation?
3. Is CPRT acceptable and beneficial compared to usual practice?
4. Are the CPRT training protocol and trainer acceptable?

Methods: This mixed-methods study included 8 teachers in a special education school in India. Over 12 weeks, teachers were trained to implement CPRT following the manualized CPRT approach by a certified CPRT trainer. Teacher fidelity of implementation was assessed via direct observation of teachers implementing CPRT lessons. Inter-observer agreement was calculated for 20% of observations. Following training, qualitative interviews were conducted with all teachers to gain in-depth information about the feasibility, acceptability, and perceived fit of CPRT. Qualitative analyses were conducted using an integrated approach that included both inductive and deductive features.

Results: Seven of eight teachers achieved CPRT fidelity during the 12-week training. Inter-rater agreement for all coded observations was high (mean = 80%, range = 41-94%). Data regarding CPRT sustainment are ongoing. Teachers described many aspects of the approach as highly acceptable and beneficial in comparison to current teaching practices. Teachers replaced repetitive, structured materials with play-based, creative activities using preference assessments. They felt more connected to students, reported that students exceeded their expectations, and found CPRT applicable to any student. Video feedback was deemed the most valuable tool for improving implementation. Teachers also described aspects of the intervention that were viewed as challenging. They found CPRT planning for all learning goals overwhelming and CPRT implementation challenging for group classes. Teachers also provided valuable information about aspects of CPRT that could be adapted to better fit the Indian context.

Conclusions: CPRT is acceptable and feasible for delivery in special education settings in India, and teachers can be successfully trained to fidelity in 12 weeks with high rates of fidelity. Adaptations to the current training protocol to account for the needs of the Indian special education context are warranted.

424.215 Improving the Fit of Behavioral Interventions for Autism in Schools: Lessons Learned from Paraeducator Feedback on the Rubies Program

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Background: The need for effective, school-based behavioral interventions for autistic students with challenging behaviors is increasingly evident as the number of autistic children in mainstream classrooms grows (Cardinal et al., 2021). Evidence-based interventions, such as Research Units on Behavioral Intervention (RUBI), have shown significant success in reducing challenging behaviors when implemented by parents in home settings (Bearss et al., 2015). However, translating such interventions to school environments requires careful adaptation to ensure feasibility and effectiveness within the unique context of public education (Chambers & Norton, 2016). RUBIES (RUBI for Educational Settings) was developed as a systematic adaptation of RUBI (Bearss et al., 2022) and was specifically designed to meet the needs of educators serving autistic youth in schools.

Objectives: The objective of this study was to analyze feedback from paraeducators who were trained in and implemented RUBIES. Specifically, we aimed to identify modifications that could further improve the program's fit and feasibility in public schools.

Methods: This study was part of a larger pilot randomized controlled trial comparing RUBIES to psychoeducation in public elementary schools across the United States. Sixteen paraeducators, who participated in the trial and implemented RUBIES with an autistic student, were interviewed after completing the study. Semi-structured qualitative interviews were conducted to gather feedback on the RUBIES training, the implementation process, and the generalizability of RUBIES to other students and educators. Interviews were recorded, transcribed, and analyzed using a Rapid Analysis Procedure (Hamilton, 2013), allowing for quick and efficient coding of themes in a time-sensitive context. Two PhD-level researchers independently coded the transcripts and achieved high inter-rater reliability (>90%).

Results: Although RUBIES had already undergone systematic adaptation for school settings, paraeducators identified several additional modifications to RUBIES content and implementation strategies that could enhance the program's utility and fit within schools. Key themes surrounding RUBIES content included: (1) a desire for content that addresses self-regulation and self-care for educators managing challenging behaviors. Themes surrounding implementation strategies included: (1) the importance of RUBIES coaches coordinating training and support with the broader educational team, (2) a preference for more individualized coaching schedules, allowing for flexible pacing based on the paraeducator's needs, (3) the creation of a digital, portable tool, such as a mobile app, that could serve as a quick reference for RUBIES strategies, (4) access to asynchronous, recorded coaching sessions, allowing paraeducators to revisit training materials at their convenience, and (5) the inclusion of instructional videos demonstrating RUBIES strategies being used in real-time classroom scenarios to enhance understanding and confidence in implementation.

Conclusions: The feedback provided by paraeducators underscores the need for continued refinement of RUBIES to better align with the realities of public schools. These suggested adaptations—such as enhancing collaboration with other educators, increasing flexibility in coaching, and providing additional resources for self-care and strategy reinforcement—will guide future iterations of RUBIES. Implementing these changes will likely increase RUBIES' acceptability, feasibility, and effectiveness. Future trials will incorporate these modifications and evaluate the impact of RUBIES in supporting paraeducators to improve outcomes for autistic students in diverse school environments.

424.216 Increasing Utilization of a Digital Health Therapeutic for Caregivers of Children with Autism and Other Developmental Disabilities: Attend|Behavior and Project Echo

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Background: Digital therapeutics are a promising way to increase the availability of evidence-based treatments. Attend|Behavior is an app based on the evidence-based RUBI parent management training program. It includes video training modules and behavioral tracking and management tools. Caregivers can use the app independently or can be supported by a clinician. When used in conjunction with ongoing in-person therapy, Attend|Behavior is associated with increased engagement in therapy and more caregivers reaching treatment goals. However, more information is needed on the use of Attend|Behavior as a standalone intervention. One barrier to this goal is low rates of utilization. In a previous clinical implementation, of families who were provided with a free tablet for clinical use and access to a free Attend|Behavior account, only 20% installed the app and only 4% actively used Attend|Behavior. Similar struggles have been found with other digital therapeutics. Training existing service coordinators who have frequent contact with families as digital coaches is one promising way to support families in using Attend|Behavior.

Objectives: Compare differences in utilization of a caregiver coaching digital health therapeutic (Attend|Behavior) for children with developmental disabilities from two non-randomized pilot implementation programs from either a self-directed or coaching framework.

Methods: The first pilot program ("Self-directed") included offering Attend|Behavior subscriptions to caregivers for self-directed use following developmental evaluations of their child. The second, ongoing, pilot program ("Coaching") involves training service coordinators through a state county board of developmental disabilities program as digital coaches to support caregiver engagement. Training was completed using the Project ECHO (Extension for Community Healthcare Outcomes) framework which is a telementoring paradigm that has been widely used to disseminate evidence-based knowledge into communities using didactics and case-based applied learning, including evidence-based care for autism and RUBI parent training. Digital coaches provide free Attend|Behavior subscriptions to the caregivers. The Self-directed pilot project had a total of 42 caregivers and the Coaching pilot project currently has 12 caregivers. Utilization metrics include number of completed didactic lessons (through the app), completion of behavior rating *check-ins*, and behavior tracking (*incidents*). Due to the presence of outliers and non-normal distributions, nonparametric (Mann-Whitney U) tests were used to compare groups.

Results: The Coaching group had significantly greater number of completed sessions ($Mdn=13$, $M=14.08$, $SD=10.11$) than the Self-directed group ($Mdn=3$, $M=8.36$, $SD=11.29$), $Z=-2.20$, $p=.03$, $r=0.30$. The Coaching group also had a greater number of completed *check-in* ratings ($Mdn=5.5$, $M=14.33$, $SD=16.76$) than the Self-directed group ($Mdn=0$, $M=2.07$, $SD=6.40$), $Z=-2.20$, $p=.03$, $r=0.35$. There were no differences in *incident* ratings (Coaching: $Mdn=0$, $M=2.92$, $SD=5.23$; Self-directed: $Mdn=0$, $M=1.05$, $SD=1.99$), $Z=-1.06$, $p=.29$, $r=0.14$.

Conclusions: Exploratory data from two pilot programs provide initial evidence that training community-based providers can support caregivers and potentially lead to greater utilization of therapeutic technology tools. Additional work is needed to confirm and expand our findings including randomized-controlled experimental designs and evaluation of behavioral outcomes of Attend|Behavior. However, our results provide an example of increasing engagement and utilization using a community-focused training program.

424.217 Initial Outcomes of a Community-Informed Driving Program with Cognitive Strategies Curriculum and AI-Based Driving Simulator

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Background: Many autistic individuals face challenges in successfully launching into independence. While a driver's license can facilitate self-sufficiency, there are low rates of driving among autistic individuals. Many factors, including concerns regarding motor coordination, executive functioning skills, and anxiety, contribute to autistic individuals' decision not to pursue driving. Thus, there is a great and immediate need for driving interventions that are based in the community targeting these concerns.

Objectives: This study addresses the transportation challenges faced by autistic individuals using a novel curriculum and AI-based virtual driving instruction platform. This open trial reports on cohort 1 data, from a larger study, testing the feasibility, usability and outcomes within 3 community sites across 3 states in the United States.

Methods: A total of 24 autistic teen/adults ($\mu=22$ yrs; 15-36 yrs) with 75% ≥ 18 years participated. Sample demographics: male (70%), race/ethnicity-21% Hispanic, 10% black/AA, 10% Native, 67% white, 21% intentionally blank, 38% in High School, 33% taking medication, 8% receiving SSI, 50% in vocational rehabilitation and 92% living with parents/family. One person had a driver's license and 17% had a driver's permit. Participants completed 8 group curriculum sessions (1.5 hrs per week) learning executive functioning and emotional regulation skills for driving and completed 5 driving simulator sessions using an artificial intelligence-based driving simulator that incorporates eye tracking and physiological sensors (45min weekly) providing feedback. Pre and post assessments included standardized assessments on anxious driving cognitions, driving avoidance, driving attitude, post changes in thoughts, emotions, behaviors and attitude towards driving, pursuit of driver's license and program satisfaction.

Results: Analyses included paired sample t-test on informant outcomes of driving cognitions, anxiety and attitude. According to teens/adults significant differences between pre and post were found for driving attitude total score ($p<.01$; $d=1.06$) and negative attitude ($p<.001$; $d=1.49$) demonstrating improvements in attitudes towards driving. Caregivers reported significant improvements in both positive ($p<.05$; $d=.67$) and negative ($p<.001$; $d=1.14$) attitudes towards driving. Driving cognitions were significant for social ($p<.05$; $d=.943$) and trended towards significance for driving cognitions total score ($p=.06$; $d=.850$) indicating decreases in problematic and anxiety-related thoughts about driving for participants. Caregivers did not report changes on this measure. (Refer to Table 1). No significant differences were found for panic-related thoughts and accident-related thoughts but there were medium effect sizes for both. No significant changes and small effect sizes were evident for driving and riding avoidance for both informants. Both informants reported the majority of participants demonstrating positive changes overall (96% self, 88% caregiver) and in positive thoughts (92% self), emotions (96% self, 81% caregivers), behaviors (67% self, 63% caregivers) and attitude (83% self, 78% caregiver) towards driving. Almost all participants reported activities towards obtaining license at post 92% compared to only 42% at baseline. All informants (participants, caregivers and providers) rated high satisfaction and indicated positive feasibility and accessibility.

Conclusions: There are currently few interventions targeting executive functioning and emotional regulation barriers to driving. The current study provides preliminary evidence for the meaningful ways a driving program could help autistic individuals pursue a driver's license.



424.218 Internalizing and Resilience-Related Symptom Changes Following the Resilience Builder Program® Group Therapy Intervention within Autistic School Aged Children

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Background: There is a high co-occurrence of internalizing symptoms among children with autism spectrum disorder (ASD). Interventions aimed at increasing resilience among children with anxiety have been shown to be especially effective. Limited research, however, has been conducted to examine how resilience-focused interventions can impact internalizing symptoms among school-age autistic children.

Objectives: The current study aimed to evaluate the effectiveness of the Resilience Builder Program® group therapy intervention for autistic school-aged children by investigating pre-to-post-intervention symptom changes.

Methods: Thirty-one children with ASD (22.6% female; $M=10.09$ years, $SD=1.76$ years) completed the Resilience Builder Program® (RBP) in a large private practice. The 12-week intervention consisted of weekly hour-long sessions focused on adaptability, emotion and behavioral regulation, and social cognition. The participant's parents completed demographic questionnaires and the Behavior Assessment System for Children Parent Rating Scale, Second Edition (BASC-2 PRS) before and after the treatment was implemented. Paired sample t-tests assessed within-subject symptom changes.

Results: Following the Resilience Builder Program®, participants showed no significant differences in Anxiety, Depression, Somatic, or overall Internalizing symptoms. There were significant improvements, however, in adaptability ($t=-2.51$, $p<.05$) and resiliency ($t=-3.42$, $p<.005$).

Significant results were not moderated by participant age or gender.

Conclusions: The findings suggest that although the Resilience Builder Program® did not result in significant reductions in internalizing symptoms, it did produce significant improvement in adaptability and resilience. Results highlight the validity of the intervention for broader resilience-based skills, the main focus of the intervention. Future research could investigate the long-term effects of RBP to assess if internalizing symptoms are affected several months after the program. Additional research could also aim to develop a version of the Resilience Builder Program that explicitly targets internalizing symptomatology.

424.219 Key Stakeholder Voices on Designing and Developing Social Robots for Autistic Students

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Background: Sustainable implementation and dissemination rely on strong research-community partnerships. Without collaboration from stakeholders, practices may not be adopted or used with fidelity. In autism intervention, engaging self-advocates, families, service providers, and researchers is crucial for increasing acceptability, feasibility, and usability. Their input is critical in shaping interventions through an iterative process to ensure relevance to their lives and needs. Autistic students often require additional language and communication support to succeed academically, socially, and in future employment. Given the rapid advancements in technology-based interventions (e.g., AI-embedded instruction), we proposed developing social robots in collaboration with key stakeholders to address these needs (see Figure 1).

Objectives:

The interview aimed to gain key stakeholders' perspectives on affordance, usability, instructional design, and instructional usefulness in designing and developing a large language model-based social robot for autistic students.

RQ1: How do key stakeholders perceive the affordance, usability, and instructional usefulness of the initial model of the large language model-based social robot for autistic students after observing the demonstration?

RQ2: What recommendations do key stakeholders offer to enhance the design and instructional integration of the social robot to increase the likelihood of its successful translation into community and school settings?

Methods: Semi-structured interviews are ongoing with key stakeholders (e.g., autism researchers, special educators, family advocates, autistic individuals, and non-autistic students). These 50-60-minute interviews focused on evaluating social robots for language and communication interventions for autistic students, addressing both technical and educational aspects. Audio recordings were transcribed, and the transcripts were reviewed by a note-taker, followed by member checks with each participant to ensure accuracy. The constant comparative method (Glaser & Strauss, 1967) was used to identify themes, allowing comparisons across groups and detecting emerging trends or patterns.

Results:

Preliminary findings revealed six themes:

1. Clarity in Language and Communication Goals: Participants emphasized the need for clear instructional goals to guide intervention design and adaptation.
2. Social Validity of Intervention: Educators noted the importance of peer perceptions and age-appropriateness of tools used in classrooms.
3. Diversity within the Autism Spectrum: All participants highlighted the need for interventions that accommodate a broad range of strengths and needs or are focus on specific needs, with room for expansion.
4. Contextual Fit in Specific Settings: Stakeholders reported interventions should incorporate environmental factors relevant to different settings like home or classroom, to ensure effective implementation.
5. Improved, Cost-Effective Technology: Recommendations included reducing response latency while keeping the technology cost-effective for future dissemination.
6. Integration of Verbal and Nonverbal Communication: Participants emphasized the importance of supporting both verbal and nonverbal aspects, as these are often intertwined in natural conversations and should be modeled in teaching.

Conclusions: Engaging key stakeholders in the design and development of social robots for autistic students is essential to ensure the technology is relevant, feasible, and effective. While stakeholders shared both similarities and differences in their perspectives, the themes identified above will guide the iterative refinement process. By collecting and incorporating these insights throughout development, the intervention's potential for successful implementation and dissemination in educational and community settings will be significantly enhanced.



424.220 Listening to Autistic Voices: A Community-Partnered Approach to Adapting PEERS for College Students

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Background:

Autistic college students complete postsecondary education at significantly lower rates than neurotypical students. Identifying ways to support these students is of critical importance. The Program for the Education and Enrichment of Relationship Skills © for Young Adults (PEERS-YA) is an evidence-based, manualized 16-week social skills group for autistic young adults, making it a promising option for social support on college campuses.

Although several studies have adapted the PEERS-YA for use on college campuses, none of these adaptations were informed by the perspectives of autistic college students or other stakeholders beyond the research teams. Adapting interventions with an established evidence-base for implementation in new contexts is an efficient and viable strategy; however, involving target end users in the adaptation process is critical to ensuring the feasibility and acceptability of the adapted intervention.

Objectives:

Study 1 - Examine the perspectives of autistic college students and parents of autistic college students regarding the feasibility/acceptability of the PEERS-YA program; use the perspectives to inform adaptations to the PEERS-YA intervention for implementation on a college campus.

Study 2 - Evaluate the preliminary effectiveness of the adapted PEERS-YA intervention in a quasi-experimental pilot study.

Methods:

Study 1 - Qualitative interviews were conducted with 10 autistic college students and two parents of autistic college students. Rapid qualitative analysis was used to ensure timely analysis and identification of adaptations. The Framework for Reporting Adaptations and Modifications – Expanded (FRAME) was used to organize final adaptations.

Study 2 - Knowledge of social skills, perceived social and empathic self-efficacy, quality of life, and college belongingness were measured pre- and post-intervention for six autistic college students and six non-autistic college students serving as social partners. Paired-sample *t*-tests were used to assess changes in outcome measures. A modified Cohen's *d* was calculated to indicate effect size. Reliable change indices (RCIs) were calculated to illustrate clinically significant changes in individual participant outcomes.

Results:

Study 1 – Autistic college students (30% male, 60% female) and parents (100% female) expressed satisfaction with PEERS-YA content but suggested shortening session length and adding sessions on handling microaggressions, appropriate emotional responding, and emotion regulation. Most autistic participants did not state a preference for an autistic or non-autistic social partners.

Study 2 – Six social partners (ages $M=20.59$, $SD=1.05$; 33.3% male, 50% female, 16.7% non-binary) and six autistic college students (ages $M=22.01$, $SD=2.48$; 33.3% male, 33.3% female, 33.33% non-binary) participated in the adapted PEERS-YA intervention. Significant improvements were observed in empathic self-efficacy for autistic participants ($p = 0.043$; Cohen's $d = 0.92$) and social skills knowledge for both autistic participants ($p = 0.006$; Cohen's $d = 2.86$), and social partners ($p = 0.011$; Cohen's $d = 2.73$). RCIs indicated that autistic participants showed meaningful improvements on measures of perceived social and empathic self-efficacy.

Conclusions:

These findings suggest that it is feasible to integrate feedback from target end users resulting in interventions that are more acceptable and thus have enhanced effectiveness. Recommendations for conducting community-partnered adaptation research with autistic stakeholders and future directions will be discussed.

424.221 Managing Anxiety in Autistic Children and Youth through Virtual Delivery of Facing Your Fears, a Group-Based Cognitive Behavioral Therapy Program: Outcomes, Implementation Considerations, and Predictors of Response during COVID-19

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Background: Autistic children and youth frequently experience co-occurring anxiety (~50-79%), often with significant interference in everyday functioning. Cognitive behavioral therapy (CBT)-based approaches are effective in treating anxiety disorders across populations. One such CBT-based approach, Facing Your Fears (FYF), is a group-based program, modified specifically for autistic children/youth. The program yields positive outcomes in controlled research settings and community implementation when delivered in-person. However, many families experience barriers to accessing the program due to limited workforce capacity and residing at a distance from specialized centers. In response to COVID-19 social distancing measures (e.g., service closures), providers adapted service models to include virtual care. This innovation promoted increased scalability of evidence-based treatments not only during, but also beyond the COVID-19 isolation periods.

Objectives: This study investigated the feasibility, acceptability, and effectiveness of FYF when delivered virtually through a tertiary care hospital in Ontario.

Methods: N = 100 autistic children/youth (aged 8-13 years; 78.8% identifying as male) and their caregivers participated in the 12-week FYF program, adapted for virtual delivery; 87 families completed the program and provided data elements. This hybrid effectiveness-implementation design study took place over a one-year period. Pre- and post-intervention questionnaire data were collected via REDCap surveys to explore adaptive functioning (ABAS-II), autism characteristics (SCQ Lifetime), anxiety symptoms (SCARED-parent and child versions) and their impact, and COVID-19-related needs (CRISIS-AFAR); satisfaction surveys were completed at the end of the program.

Results: Parents reported high satisfaction with the program ($n = 87$, $M = 7.95$ out of a total possible rating of 9, $SD = 1.03$). Participants represented 13 of the province's 14 local health regions, with participant representation missing from only one region (North-West).

Paired samples t-tests yielded significant parent-reported improvements for Total Anxiety ($M = 34.91$ vs 27.90 , $t = 3.99$, $p < .001$; Cohen's $d = 0.56$) and Generalized Anxiety ($M = 10.70$ vs 8.88), $t = 3.18$, $p = .008$; Cohen's $d = 0.45$). The rate of children/youth meeting clinical cut-offs for Total Anxiety decreased significantly from 76% to 57% ($\chi^2 = 7.27$, $p = .007$). Significant improvements on the self-reported SCARED-C also emerged for Anxiety Total ($M = 34.52$ vs 28.85), $t = 3.08$, $p = .002$, Cohen's $d = 0.44$.

The CRISIS-AFAR was used to measure COVID-related factors. Linear regressions revealed two significant predictors of response to intervention, **positive outlook** ($r^2 = .049$, $p = .027$, $\beta = 1.765$; i.e., lower baseline positive outlook predicted greater improvement in anxiety) and **material deprivation** ($r^2 = .041$, $p = .044$, $\beta = .860$; i.e., greater baseline material deprivation predicted greater reduction in anxiety).

Conclusions: Virtual delivery of FYF is feasible and effective for treating elevated anxiety in autistic children/youth and may improve access across wide geographic areas. COVID-related hardships did not impede families' ability to benefit from the program; conversely, caregivers experiencing such hardships benefited slightly *more* from the program, suggesting that perhaps COVID-related hardships bolstered caregivers' motivation to seek mental health supports for their children and help them make positive change.

ClinicalTrials.gov identifier: NCT04666493

424.222 Mindfulness Intervention for Caregivers of Children with Autism in Rural Environments of Maine: Mind-Care Maine

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Background: Caregivers of children with autism spectrum disorder (ASD) experience significant stress from managing behavioral and communication challenges, which can lead to heightened anxiety, depression, and physical health issues. These stressors may adversely affect caregivers' well-being and their ability to provide effective care. Rural caregivers, particularly in underserved communities, face additional burdens due to social isolation, limited access to specialized services, and delayed diagnosis. Traditional mental health interventions often require in-person participation, presenting logistical challenges that underscore the need for accessible, remote support options.

Objectives: This pilot clinical trial aims to assess adherence, acceptance, satisfaction metrics, and the potential efficacy of a 30-day mobile app-based mindfulness training program, Unwinding Anxiety (UA), in reducing anxiety among caregivers of children with ASD in rural Maine.

Methods: We conducted a preliminary analysis of pilot data from the ongoing MIND-CARE Maine clinical trial, which has collected data from 14 parents (7 cohabiting couples) of children with ASD in rural Maine. Adherence data was tracked through the UA app, calculated as the average number of modules completed out of 30. Anxiety scores were assessed at baseline, and on days 7, 14, 21, and 28, using the GAD-7 (Generalized Anxiety Disorder-7), a brief self-report questionnaire where higher scores indicate more severe anxiety. Acceptance and satisfaction metrics were developed for the study, with items including questions about the acceptability and overall satisfaction with the UA program.

Results: The caregivers were an average age of 48 years old ($SD=8$), were white (100%), and mostly identified as non-Hispanic (93%). Among the caregivers, 75% of mothers and 67% of fathers reported having a mental health diagnosis (e.g., anxiety, depression). The majority of couples were heterosexual (86%), married (86%), with an average household income exceeding \$100,000 (70%). Children were on average 13 years old ($SD=5$) and predominantly male (86%), with an average diagnosis age of 8 years ($SD=5$). Caregivers completed an average of 34 UA modules ($SD=30$), surpassing the required 30 modules, as many chose to independently repeat sessions, indicating high adherence. Preliminary analysis showed anxiety scores decreased from a mean baseline of 7.64 ($SD=4.6$) to 4.0 ($SD=3.2$) by the study endpoint, suggesting potential efficacy (Figure 1). Acceptability ratings exceeded 50%, indicating most caregivers found the intervention acceptable, engaging, and effective (Figure 2). Notably, 100% of caregivers felt their anxiety justified using this intervention, and 98% reported it as useful for reducing stress.

Conclusions: Preliminary findings from the MIND-CARE Maine trial suggest that the Unwinding Anxiety mobile app-based mindfulness training program effectively reduces anxiety among caregivers of children with ASD in rural Maine. The high adherence rates and reduction in anxiety scores support its potential efficacy. Furthermore, positive acceptance and satisfaction metrics indicate that this app met the need for accessible mental health support in this underserved area. While the sample size is currently small, these results provide a strong foundation for our future exploration of the scalability and long-term impact of mindfulness interventions on caregiver mental health.



424.223 Mitigating the Impact of Dysregulation on Learning Outcomes for Autistic Pupils

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Background: Teaching children to identify and manage their emotions is a statutory right in education, forming part of the UK National Curriculum. However, while much research has focused on parents and caregivers in the context of diagnoses or mental health services, few studies have addressed emotional regulation within educational settings.

The dominance of the medical model in research has emphasized fixing the individual rather than considering broader social structures and contexts. With significant gaps in research around the strong links between emotional dysregulation and poor educational outcomes—particularly in autism, where dysregulation is being increasingly recognized.

Objectives: This study aimed to address gaps in the research, reframing traditional medical narratives by employing the neurodiversity paradigm. It used an everyday school setting (a specialist primary school for autistic children), promoting collaborative engagement among all stakeholders, including teachers, teaching assistants, and pupils. This was framed within a social model, a 'Community of Practice', to foster shared practices within specific contexts.

Methods: The study used a qualitative, mixed-methods approach. A focus group of teachers and teaching assistants discussed emotional regulation and dysregulation, exploring how regulation is built throughout a busy school day. Classroom observations provided real-time data on how dysregulation manifests and is managed through environmental adjustments, teacher interventions, structured routines, and physical movement. Additionally, three case studies focused on individual children, using innovative methods and adapted strategies to better understand their experiences and perspectives.

Results: The focus group data were analysed using thematic analysis, revealing key areas of consensus: Physical movement, predictability, and structure were identified as key strategies for fostering regulation; Identifying regulation and dysregulation were less dependent on external behaviours but more of a “felt state”, requiring teachers to have nuanced, flexible approaches; with teacher regulation and teamwork also essential. Classroom observations across three classes were analysed to establish patterns in practice, revealing three key aspects: Classroom environment management; Team organization and its impact and Children's participation and engagement, with differences noted between novel and familiar tasks.

The 'Child Voice' data, presented as three case studies, were analysed to identify linked issues around timetabling and task relatability.

Key findings emphasized the importance of purposeful movement in regulating children. This was evident both in lessons, where children had options to wander and opt out as a primary regulation strategy, and in planned movement sessions throughout the school week. Additionally, there was widespread use of prompting or modifying work to support already highly differentiated learning. It prompted reflection on potential misunderstandings of children's thought processes and feelings, leading to questions about mismatches in learning support.

Conclusions: Emotional regulation was found to be closely linked with purposeful physical movement and prompted understanding pupil experiences more deeply as a priority. Future research should explore the potential harms of misplaced expectations, especially those stemming from misunderstandings of attention and interest differences, which may contribute substantially to the dysregulation observed. Cultivating a 'Community of Practice' appears to be a promising approach to managing increasing workloads as well as supporting and creating meaningful change within this setting.

424.224 Multidisciplinary Intervention to Support Autistic Children during Long Term Epilepsy Monitoring

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Background: Children with autism spectrum disorder (ASD) are at increased risk for comorbid medical conditions, including epilepsy. Although epilepsy is often managed with medications, approximately 30-40% develop intractable epilepsy. Best practice for children with intractable epilepsy is a multiple day hospital admission with EEG and neuroimaging to determine other interventions to reduce seizures (Phase 1). These admissions can present unique challenges for autistic children due to communication delays, sensory aversions, and repetitive, self-injurious, or other disruptive behaviors. At our hospital, interviews with caregivers and providers identified similar challenges, along with related concern about the ability of autistic children to tolerate Phase 1 admission. Minimal research exists on evidence-based procedures to support children with ASD during EEG, and no known formal multidisciplinary programs exist. To fill this gap, we created an intervention program for children with ASD and intractable epilepsy, who were referred for Phase 1 admission.

Objectives: This presentation will describe the multidisciplinary development of an intervention program for children with ASD and epilepsy, components of the program, and results of a quality improvement (QI) project.

Methods: The intervention was developed and evaluated using QI methodology. Along with input from a multidisciplinary team (neurologists, nurse practitioners, nurses, child life specialists, EEG technicians), the authors developed a 3-tiered approach for child and family preparation utilizing a parent interview and behavior analytic principles. Individualized information about child needs for hospital admission was communicated to the inpatient team prior to admission. Behavior intervention, based on the child's needs, was implemented prior to admission by a psychologist or a Board Certified Behavior Analyst.

Results: From January 2020 to October 2024, 64 patients participated in the program. 73% were male, with an average age of 10.9 (range 2.6-18.9). 65% were white, 24% were black, 8% were biracial, and 2% were Asian.

The aim for the QI project was to increase the percentage of patients with ASD and epilepsy who participated in a comprehensive treatment program prior to Phase 1 admission, from 0% to 80%, by January 2021, and maintain through 2026. Initial baseline was 0% enrollment, as the program did not previously exist. 64 referred patients participated in the program (84%). 98% of patients enrolled were to complete all required medical procedures during Phase 1 admission. Caregiver behavior rating during admission were introduced in July 2024. Data regarding child disruptive behavior during admission, and caregiver perception of procedures, and caregiver empowerment was recently implemented, and available data will be included in the presentation.

Conclusions: This program highlights the need for and success of individualized multidisciplinary care for those with intractable epilepsy and ASD requiring epilepsy monitoring. This project is now standard of care at our hospital. Although autistic children with a comorbid medical condition may present with concerns or challenges for an evaluative medical procedure, it is possible for increased participation and caregiver satisfaction. Interventions such as ours which incorporate preparation, support, and multidisciplinary collaboration, allow for improved medical care and quality of life for autistic children and their families.



424.225 Nature Playgardens: A Six-Week Therapeutic Emotional-Behavioural Intervention Program for ASD Children and Their Caregivers

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Background:

Nature is powerful in improving the mental well-being of neurotypical children. A lack of affordable and accessible therapies for autistic children in their neighborhood, with evidenced based family-centered therapies and self-care programs for families with autistic children are common. There is a scarcity of studies conducted in tropical natural environments using validated clinical nature program protocols.

Objectives:

This study aimed to establish the usefulness of a nature-based clinical therapeutic intervention, consequently developing an accessible, replicable and validated program in the neighborhood children playgarden, that not only improves the emotional-behavioral difficulties of ASD children, but also reduces caregivers' stress and burden.

Methods:

A 6-week intervention program curated based on DIRFloortime® principles, carried out in specially designed Nature Playgardens, facilitated by trained professionals. Participant dyads (n=28) were boys aged 5-9yo diagnosed with ASD and their caregivers aged 21-80yo. The intervention consisted of 90-minute sessions of caregiver and facilitator assisted nature play, segmented into warm-up/cool down, child-led activities, collaborative activities. Caregivers were required to complete a training program by occupational therapists prior to the intervention. Study consisted of 4 time-points, pre (T0), mid (T1), post (T2), post 4-weeks (T3) intervention.

Child's psychosocial quality of life was measured using Pediatric Quality of Life Inventory (PEDsQL) at T0, T2, and T3. Emotional Regulation Checklist (ERC) – completed at T0 and T2 – consisted of 2 subscales testing for child's negative emotional reactivity and emotion regulation abilities. Caregiver's mental well-being was measured using the General Health Questionnaire (GHQ-12) at T0, T1, T2 and T3; caregiving burden was measured using the Burden Scale for Family Caregivers (BSFC-s).

All scales were scored by caregivers.

Results:

Linear Mixed Model Analysis controlling for age revealed at 95% CI:

Child participants' negative emotional reactivity (ERC) significantly decreased from T0 to T2, mean difference = -4.71, $p < .001$, CI (-6.31, -3.11).

Child's psychosocial quality of life (PEDsQL) significantly increased from T0 to T2 and T3. Mean difference (T2) = 5.96, $p = .004$, CI (1.98, 9.95). Mean difference (T3) = 6.82, $p = .001$, CI (2.84, 10.81).

Caregivers' mental well-being increased with a significant decrease in GHQ-12 scores from T0 to T0 to T2, mean difference = -2.03, $p = .046$, CI (-3.82, -.034).

Though there were no significant changes in caregiving burden, Pearson correlation revealed a significant negative relationship between caregiving burden and child's psychosocial quality of life at T2, $r(26) = -.42$, $p = .027$. Suggesting that with the child's psychosocial quality of life increases, caregiver's burden decreases.

Conclusions:

This study demonstrated the efficacy of a clinical nature-based therapeutic intervention in improving the emotional and social health of children with ASD. Child participants experienced a decrease in frequency of negative emotional reactions while experiencing an increase in psychosocial quality of life. This improvement in their child's quality of life was also found to simultaneously decrease caregiver's caregiving burden.

Caregivers also experienced an increase in overall psychological well-being after 6 weeks of intervention. Overall, the validation of this program provides families with ASD children an effective, accessible and affordable self-care intervention program.

424.226 Navigating Mathematics Education for Autistic Children: A Parental Insight

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Background: Autistic children often face unique challenges in learning mathematics, including sensory processing difficulties, communication barriers, and numerous other challenges. These challenges may affect their ability to understand math concepts and succeed in traditional classroom settings. Despite the critical role that parental support plays in the education of autistic children, scarce research has examined how parents perceive their involvement in their child's math education, their interactions with teachers, and the use of technology to support learning. To fill this gap, we explored parental perspectives on the mathematics education of their autistic children, with an emphasis on identifying common challenges, successes, and areas for improvement.

Objectives: The objective of this study was to qualitatively investigate the perspectives of parents on the mathematics education of their autistic children. In this study, we sought to understand how parents perceive their involvement in their child's math learning, their experiences with technology in math instruction, the quality of communication with teachers, and their expectations for their child's future academic success.

Methods: This exploratory study utilized semi-structured, in-depth interviews to gather qualitative data from 12 interviews of parents of autistic children currently attending k–12 schools in the U.S. Participants were recruited through network-based sampling using flyers distributed via social media, email listservs, and advocacy organizations. Individual interviews were conducted virtually using the Zoom platform, recorded, and transcribed for analysis. An inductive thematic analysis was applied to the transcripts to identify key themes, with inter-rater reliability conducted to ensure consistency in coding.

Results: Preliminary findings suggest that parents face significant challenges in supporting their autistic children's math education. Common issues include difficulty with word problems, the need for frequent practice to grasp math concepts, and sensory overload during mathematics classes. Parents with strong math backgrounds are able to provide after-school support, while those with less experience struggle to assist their children effectively. Access to technology also varies widely, with some parents actively seeking devices to support their child's learning. Many parents expressed frustration with the limited interaction and support they receive from teachers, citing concerns about whether the school's instructional methods are meeting their child's needs. Additionally, some parents emphasized the importance of providing their children with opportunities for inclusion in classroom settings, while also ensuring adequate support for individualized learning.

Conclusions: This study underscores the complexities faced by autistic children in learning mathematics and the challenges parents encounter in supporting their child's education. The findings highlight the importance of enhancing communication between parents and teachers, increasing access to technology, and fostering educational environments that are both inclusive and responsive to the individualized needs of autistic learners. These results suggest a need for future research and interventions that better support both parents and teachers in addressing the unique math learning challenges of autistic children.

424.228 Neuro-Strengths Based Support for Autism: From the Autistic Lens

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Background:

Autism spectrum disorder (ASD) presents complex challenges that traditional interventions often fail to address by solely focusing on deficit remediation, as opposed to a holistic approach that incorporates skills already present. Although ASD diagnoses are based on behavioral assessments, neuroscience research demonstrates that brain differences underlie those behaviors, which suggests that interventions informed by neurological understanding could offer more effective support. Despite these insights, many existing interventions still prioritize "normalizing" behaviors based on standardized assessment outcomes, which may not align with the unique neurological profiles and strengths of autistic individuals. This often leads to stress while learning and limited progress towards goals that are often not meaningful to the individual. A shift towards a strengths-based, neurobiologically informed approach could address limitations of current treatment paradigms and provide more tailored and effective interventions.

Objectives:

This study explores the feasibility and acceptability of the Neuro-Strength-Based Support for Autism (NSBSA) training provided to Speech-Language-Pathologists (SLP) and Occupational Therapists (OT) who serve autistic clients. We also evaluated whether therapists were able to shift their client's goal from deficit-focused to a strengths-based approach, and if their satisfaction in the goal-writing processes improved as a result.

Methods:

The NSBSA framework was developed by an autistic occupational therapist aiming to bridge the gap between research and practice by translating neuroscience findings into actionable strategies for practitioners. Participants included nine SLPs and seven OTs who participated in a 16-hour video-conference training program over 8 weeks. The training covered eight modules, including interpreting behaviors, sources of motivation, neuroscience research on inputs and self-awareness, and developing client-centered program goals. Feasibility was assessed through attendance and attrition rates, while acceptability was measured via post-intervention Course Satisfaction Survey. Pre- and post-intervention data were collected on participants' satisfaction with their goal-writing, measured on a Likert scale of 0 (No/Not at all), 1 (Some/Somewhat), and 2 (Yes/Very), and a knowledge assessment that evaluate their clinical reasoning in goal-writing practice.

Results:

Feasibility was high, with participants completing 7.29 ± 1.27 modules and attending 7.07 ± 1.21 Q&A sessions on average, with low attrition ($n=1$; 6%). Participants also reported high satisfaction and acceptability of the NSBSA training program, finding the content relevant to their practice (Table 1). Pre- to post-intervention assessments revealed significant improvements in both goal-writing satisfaction ($p < 0.001$) and goal-writing knowledge ($p = 0.005$).

Conclusions:

Preliminary findings indicate that NSBSA is a feasible and acceptable framework to improve autism service providers' experience and align therapeutic goals to motivations of autistic individuals. By leveraging strengths and neurobiological understanding, NSBSA offers a promising direction for traditional intervention models to evolve in a direction that can empower providers and reduce stress for autistic individuals. Importantly, the NSBSA framework can be applied to any existing autism intervention program to make them more attuned to unique neuro-profiles.

424.229 Neuroaffirming CBT for Autistic Adults: A Mixed-Methods Study Evaluating the Feasibility of Co-Production and Co-Facilitation

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Background: Cognitive Behavioral Therapy (CBT) is an evidence-based intervention for reducing symptoms of anxiety and depression among autistic adults. However, there is a need for neuroaffirming interventions that are specifically adapted for autistic individuals. Others have cited the benefits of co-production and co-facilitation with autistic self-advocates, which integrates lived experiences alongside clinical interventions. Feasibility studies are necessary to inform future research examining effectiveness, however, none have assessed the feasibility of an autism-informed, co-produced, and co-facilitated CBT group.

Objectives: Using a mixed-methods approach, this study examined the feasibility of an adapted CBT group for autistic adults with co-existing mood and/or anxiety diagnoses in an outpatient clinic.

Methods: CBT groups for autistic adults (ages 20-25) with mood and/or anxiety diagnoses were conducted in an outpatient clinic using Mind Over Mood 2. Groups were facilitated by clinicians for 120-minutes/week over 8 or 13-weeks with 4-7 participants. Adaptions were made based on group feedback, current literature, clinical observations, and collaboration with an autistic self-advocate and included: increased structure and predictability, increased visuals and response options, increased communication modalities, supports for executive functioning, consideration of sensory needs, and the integration of autism-specific topics (e.g., alexithymia, autistic burnout). An autistic-self advocate was included as a co-facilitator of the third group. Feasibility was assessed using the key areas of focus from Bowen et al. (2009) framework. Qualitative feedback was collected using an anonymous survey and focus group. Limited-efficacy was assessed using questionnaires on symptoms of depression (PHQ-9) and anxiety (GAD-7). Data collection is ongoing, with an additional 12 participants expected by January 2025.

Results: The demand for adult autism services is high, with consistent referrals creating a long waitlist. Existing clinic infrastructure was sufficient for the successful implementation, integration, and expansion of the group. Adaptation was informed by multiple sources, as described above. Regarding practicality, the initial development process was time intensive (3-5 hours/week) but remitted for subsequent groups. Acceptability was high, as all participants who completed the survey agreed (n=2) or strongly agreed (n=6) that sessions were informative, helpful, and that they were satisfied. All participants would recommend the sessions to others. Participants commented that they “liked the autism specific stuff and the autistic co-facilitator’s experience” and “it was helpful to have flexibility and sensory accommodations”. Eleven participants completed pre- and post-intervention questionnaires for limited-efficacy testing. Results from the two-sample sign tests were non-significant for the PHQ-9 ($p>.05$) and the GAD-7 ($p>.05$), though 5 participants reported decreases in anxiety.

Conclusions: Neuroaffirming CBT was feasible across multiple key areas of focus. Autistic adults benefited from the autism-specific adaptations to the group structure and content. Further, the inclusion of an autistic co-facilitator fostered honest discussions and provided opportunities for group members to connect through shared experiences. Clinical changes were not detected, attributed in part to the small sample size and long-standing mental health concerns of the cohort. Clinicians are encouraged to involve autistic self-advocates as consultants, collaborators, and facilitators in a respectful, meaningful, and inclusive manner, to further document how manualized psychological interventions may be adapted and optimized.



424.230 Parent Involvement in Language Interventions for Autistic Students: A Systematic Review

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Background: Parent involvement in the education of autistic students fosters a positive cycle of improvement for both students and families. By supporting learning at home, parents extend opportunities beyond those provided by professionals, improving students' progress in learning and building parents' confidence while reducing stress and isolation. As language and communication are key support areas for autistic students, parents can reinforce these skills across various contexts. Although the effectiveness of parent engagement and parent-mediated interventions are well-documented, there is limited research on their use with school-aged students. Thus highlighting the need for further exploration in this underinvestigated area.

Objectives: The purpose of this systematic review is to synthesize research on the impact of parent involvement in supporting language development for school-aged autistic students, and the following research questions guided the study:

RQ1. What are the characteristics of studies examining parent involvement in language interventions for autistic students?

RQ2. What are the characteristics of participants (i.e., parent, student, professional) on parent involvement in language intervention for autistic students?

RQ3. How are nonspeaking autistic students represented in studies on parent involvement in language interventions?

RQ4. How is the effectiveness of parent involvement in language interventions for autistic students reported in the literature?

Methods: The systematic review adhered to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (see Figure 1). Data were extracted and categorized into study characteristics, participant characteristics (students, parents, and professionals), reported language outcomes, and the representation of nonspeaking autistic students. Study quality was evaluated using the Cochrane Collaboration's Risk of Bias Tool for quasi-experimental designs and single-case designs. To ensure coding accuracy, two authors independently coded all included studies and calculated and reported interrater reliability.

Results: We included 7 RCT and 1 SMART design studies for review ($n = 8$). Most studies involved mixed-age groups (5-13 years old), and 66.7% focused specifically on children aged 9 and below. Non-speaking autistic students were included in only one study. Three studies reported the primary language of students and parents, while socioeconomic status was reported in just one. The types of language interventions varied across studies and were implemented by trained clinicians in most cases (87.5%), with no study involving parents as primary interventionists. Most studies were conducted in research institutes or hospital-based clinics (87.5%), with only one taking place in the family's home. Social communication was the most commonly targeted outcome across the included studies. Different parent teaching strategies were used, with feedback and rehearsal being used most frequently.

Conclusions: The findings of this review indicate that parent involvement in language interventions leads to positive developmental outcomes for autistic students. However, more research is needed to address the unique aspects of elementary school settings because the environmental factors specific to these settings may influence student outcomes.



424.231 Parent-Mediated and Paraprofessional-Mediated ABA: Effects on Goal Attainment and Adaptive Behavior

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Background: Parent-Mediated applied behavior analysis (ABA) is an evidence-based intervention that focuses on building parenting skills to effectively implement behavioral procedures with their child to teach new skills as well as manage difficult behavior. Parent-Mediated ABA has been shown to produce positive outcomes for autistic children as well as their parents. In addition, parent-mediated ABA has several benefits compared to paraprofessional-mediated delivery models, including requiring less of a time commitment from families, and the ability for parents to use the skills they learn in treatment beyond the duration of the intervention. However, parent-mediated ABA is underutilized in community settings. This may be because, compared to the evidence base for traditional, paraprofessional-mediated models of ABA, there is comparatively less of a research base for parent-mediated ABA.

Objectives: We sought to expand the research base for parent-mediated ABA by comparing community-based parent-mediated ABA with a traditional, paraprofessional-mediated ABA intervention.

Methods: We analyzed quasi-experimental, retrospective clinical data of clients with ASD in either paraprofessional-mediated ($n = 197$) or parent-mediated ($n = 198$) ABA. Participants were youth with ASD (Mean Age = 6.40 years) who already participated in their respective intervention. Treatment type was not randomized; clients' parents chose the treatment modality in accordance with clinician recommendations. Outcome measures included adaptive behavior (as measured by the Vineland-III) and goal attainment (as measured by the Goal Attainment Scale) across three time points spanning 18 months.

Results: A two-way mixed ANOVA indicated no significant difference in the adaptive behavior composite nor the socialization, communication, and daily living skills subscales, either between groups or over time. A separate two-way mixed ANOVA showed significant differences in goal attainment between treatment conditions, across time, and with a significant interaction. Overall, the parent-mediated group had significantly higher goal attainment than the paraprofessional-mediated group, although all groups improved significantly over time. The interaction effect indicated that the parent-mediated group improved more, and more quickly, than the paraprofessional-mediated group.

Conclusions: These results suggest that parent-mediated ABA may be an acceptable alternative to paraprofessional-mediated interventions. In particular, parent-mediated ABA may be of particular use in skill acquisition, as exemplified by the progress made by clients in the parent-mediated group in goal attainment. One strength of this study is its large sample size. However, treatment conditions were not selected by random assignment; clients' parents were able to choose the treatment modality that best suited their needs. As such, more RCT evidence is necessary to confirm the effectiveness of parent-mediated ABA compared to its paraprofessional-mediated counterpart.

424.232 Peer-Mediated Intervention Using Lego®-Based Therapy in Brazilian Children with Autism Spectrum Disorder

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Background: The LEGO®-based Therapy is a structured play-based intervention designed to promote social interactions within a natural play activity using Lego materials. The sessions involve collaborative LEGO® model building, in which each participant is assigned a distinct role—engineer, supplier, or builder—each responsible for different tasks. This role allocation is specifically aimed at fostering cooperation, enhancing communication, and encouraging problem-solving within the group.

Objectives: To verify the effects of LEGO®-Based Therapy in social interaction of children with autism spectrum disorder (ASD) in a afterschool setting. The objective was to compare a peer-mediated group, a specialist-mediated group, and a control group on a waiting list, to determine which group achieved the most significant gains.

Methods: Eighteen children with ASD from public schools in Embu das Artes, three neurotypical peers who served as mediators, aged between 5 and 8 years (neurotypical peers were matched by sex and gender with children with ASD), and one specialist, participated in the study. Prior to the intervention, the peer mediators underwent training in three role-playing sessions designed to prepare them for their role. The intervention consisted of 14 sessions, twice a week, each lasting 40 minutes, following structured LEGO®-based Therapy. The results were analyzed by video coding clips from all sessions, conducted by two independent judges. They checked the indicators of interaction skills acquired and the data compared pre, post and follow-up sessions to identify possible improvements in the stimulated behaviors by each group.

Results: The interobserver agreement was 86.3% (Kappa = 0.92 [95% CI 0.91-0.94]), classified as substantial or strong agreement. The specialist-mediated group showed an increase in the mean number of interactions from 1.01 to 12.93 ($W = 0.00$, $p = 0.03$; $d = 14.15$), as did the peer-mediated group, which increased from 0.73 to 13.27 mean of interactive behaviors ($W = 0.00$, $p = 0.03$; $d = 3.73$), both with large effect sizes. In contrast, the control group remained stable, with mean interactions ranging from 1.19 to 1.13 ($W = 12.50$, $p = 0.75$; $d = 0.11$), showing no effect size.

Conclusions: Both intervention groups demonstrated greater improvements compared to the control group. The most significant finding was that the structured LEGO®-based Therapy, when combined with peer mediation, can be an effective and low-cost strategy for enhancing interaction skills in children with ASD. This approach shows great promise as a tool for use in ASD interventions, highlighting the potential of peer mediation as an accessible and scalable resource for ASD therapy programs and in special education. These results support the integration of peer-mediated interventions into broader educational and therapeutic frameworks, particularly for promoting social and communication-based skills in children with ASD.

424.233 Perceptions of Cognitive Behavioral Therapy Among Autistic Adults

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Background: Cognitive behavioral therapy (CBT) is useful for enhancing emotion regulation, making it an effective tool targeting social anxiety symptoms in autistic adults (Wenzel, 2017; Bemmer et al., 2021). The new social skills training intervention, Training to Understand and Navigate Emotions and Interactions (TUNE In), integrates 3 elements of CBT to reduce social anxiety: the thoughts feelings and behaviors log, anxiety thermometer, and automatic thoughts identification. Perception of helpfulness of these CBT elements has been related to efficacy of the intervention (Yarwood et al., 2021; Walsh et al., 2018). Given that, this study aims to evaluate the acceptability of the CBT elements in TUNE In through a qualitative interview, informing perceived efficacy.

Objectives: We aimed to qualitatively evaluate participants' perceptions of 3 CBT elements in TUNE In. We also sought to understand participants' previous experience and familiarity with psychotherapy and the elements of CBT.

Methods: Nineteen adult autistic participants without intellectual disability completed the TUNE In intervention. Fifteen of these participants completed an optional, post-TUNE In interview over Zoom. They were asked about past therapeutic intervention history (yes/no/maybe), past favorability (strongly disliked/disliked/neutral/liked/strongly liked) and efficacy (very poor/poor/fair/good/excellent) of CBT. They were asked to then rate the three CBT components on familiarity (not at all/slightly/moderately/very/extremely) and usefulness (not at all/slightly/moderately/very/NA), and if the component's level of focus (much less/less/same/more/much more) and presence (yes/no/maybe/NA) should change.

Results: We found that participants most commonly had prior experience with CBT, DBT, and General Talk therapy (refer to Table 1.0). Retrospectively, participants had a diversity of views on favorability of CBT, and a majority found it to be at least fair in efficacy (see Table 1.0). Most participants were also at least slightly familiar with all three CBT elements (ranging from 86.7% - 100% for the 3 elements). In the context of the intervention, most participants felt the 3 elements were at least slightly to extremely useful (73.3%-100%), wanted it to remain a part of TUNE In with at least the same amount of focus (53.3% - 66.7%), and a majority wanted all elements to remain in the intervention (73.3% - 80%). It should be noted that 26.6% of participants wanted less of the anxiety thermometer and 26.7% thought it was not at all useful (see Table 2).

Conclusions: In general, autistic adults tended to have a variety of therapeutic experiences, with a vast majority of the participants in this study having prior experience with CBT (Benevides et al., 2020). Unsurprisingly, they were all also generally familiar with the 3 CBT elements assessed here, found all 3 elements mostly useful, and wanted the elements to remain in the intervention with a similar level of focus. These results reflect the acceptability of CBT for addressing the social anxiety symptoms that many autistic adults experience, and the importance of including these elements in later iterations of TUNE In (Bemmer et al., 2021). In the future, we will recruit a larger cohort of participants to better understand the preferences and experiences of autistic adults in TUNE In.



424.234 Pilot RCT to Compare a Home-Based Tailored Cognitive Behavioral Therapy for Insomnia (CBT-I) Versus Web-Based CBT-I to Improve Sleep in Caregivers with Insomnia in the Context of Caring for an Autistic Child with Insomnia

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Background:

Autism spectrum disorder represents one of the most perplexing neurobiological differences with a prevalence of 1 in 36 children. Lifelong challenging and distinctive behaviors often associated with ASD may have a significant impact on caregivers' mental health and family functioning, including the ability to develop and maintain healthy sleep routines for themselves and their child.

Objectives: To determine the acceptability and feasibility of a RCT utilizing a web or home-based CBT for Insomnia intervention implemented by nurses to improve sleep of a caregiver and autistic child.

We will examine caregiver and child sleep parameters and daytime behaviors pre and post intervention.

Methods:

40 caregivers/child dyads will be recruited from The Children's Hospital of Philadelphia. Caregivers must be 18 years or older and children must be 3-17 years old with confirmed ASD diagnosis. Each must meet criteria for insomnia. The modified CBT-I is a 6 week intervention that includes 1) A one hour education session developed by the Autism Treatment Network, Sleep Tool Kit; 2) Identifying positive evening routines, developing a visual schedule and implementing ecological changes, 3) Introducing a calming module with 12 soothing activities as suggestions to be incorporated into the bedtime routine and 4) Developing a bedtime protocol pairing irresistible sleepiness with going into the bedroom (stimulus control). Each dyad will be randomized into either the web or home-based intervention after education visit. At baseline and 8 weeks follow up, participants will complete sleep measures including one week Fitbit data, sleep diaries, sleep questionnaires and behavioral measures including, CBCL, PHQ-9, GAD-7, parent efficacy scale. An acceptability survey will be completed at week 8.

Results:

To date, 27 dyads have enrolled in the study. Caregivers N= 6 fathers and N= 20 Mothers and 1 Paternal grandmother. Children N=5 female, N=1 transgender. N= 21 male, mean age of caregivers 44 yo, mean age of child 7.5 years old. 66.7% white and 33.3 % Minority. To date Caregivers have found the study acceptable (Lickert scale of 1-7 with 7 =strongly agree) in terms of randomization 6/7 , assessment of sleep problems 7/7, communication with nurses 7/7, frequency of visits 6/7, tailoring CBT for themselves and their child 7/7.

Conclusions:

We will determine acceptability and feasibility, summary statistics calculated from survey.

Using linear mixed-effects modeling, sleep measures will be assessed prior to and following the intervention. We will test for differences in characteristics of caregivers and children whose symptoms improve, stay the same, and worsen over time. T-Tests will be used. This data will support a larger RCT with the Department of Defense funding opportunity through the Congressionally Directed Medical Research Program. This Autism Research Program focuses on improving lives of those living with ASD.

424.235 Pilot Randomized Controlled Trial of Mindful Time, a Novel Telehealth Mindfulness-Based Intervention for Autistic Adolescents and Their Caregivers

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Background: There is a need for accessible psychosocial interventions for autistic youth with co-occurring mood symptoms. Research suggests that mindfulness-based interventions (MBI) may be a valuable method for reducing internalizing symptoms in autistic adults (Forbes & Miller, 2023). Less is known about MBIs for autistic adolescents. This study examined MINDful TIME (Mindfulness-based Intervention for NeuroDiverse Teens: Telehealth Instruction, Mobile-app Enhanced), a novel group-based telehealth intervention for autistic adolescents and their caregivers.

Objectives:

- 1) Examine feasibility and acceptability of MINDful TIME.
- 2) Compare change in adolescent depression, anxiety, and mindfulness between treatment (Tx) and delayed treatment control (DTC) groups.
- 3) Explore whether treatment-related improvements were maintained at 2-month follow-up.

Methods:

Participants in this hybrid feasibility and pilot parallel randomized controlled trial were 42 adolescent-parent dyads. Randomization was stratified by adolescent age, biological sex, and race/ethnicity. Tx participants (n = 21) attended eight weekly group meetings conducted through Zoom, during which they learned mindfulness strategies and habit formation techniques to establish a regular mindfulness practice. DTC participants (n = 21) completed an 8-week wait period prior to beginning the program. Participants in both groups completed a follow-up visit 2-months after program exit (n = 34).

Feasibility was assessed using attendance and fidelity of implementation checklists. Acceptability was measured using teen- and parent-report acceptability questionnaires. At each timepoint, parents completed the Children's Depression Inventory (CDI-2) and Multidimensional Anxiety Scale for Children (MASC-2). Adolescents completed the Child and Adolescent Mindfulness Measure (CAMM).

Results:

The program was implemented with fidelity (90.28-96.25%) and 90% of Tx dyads completed the program. Participants attended > 90% of sessions and reported high acceptability. There was a significant effect of group on the combined dependent variables (CDI-2, MASC-2, and CAMM positive change scores from baseline to program exit) when controlling for baseline values (Pillai's Trace = .217, $F(3, 32) = 2.95$, $p = .047$, $\eta_p^2 = .22$). Reported in Table 1, follow-up univariate tests indicated that Tx adolescents showed greater improvement in depression symptoms at program exit than DTC. There was not a significant difference in MASC-2 change scores. However, there was a significant treatment group by biological sex interaction ($F(1, 34) = 4.22$, $p = .05$, $\eta_p^2 = .11$) with Tx females demonstrating a larger improvement in anxiety symptoms than DTC females ($F(1, 34) = 4.24$, $p = .05$, $\eta_p^2 = .11$). The univariate test for CAMM was approaching significance with a medium effect size, suggesting that Tx participants may have increased levels of mindfulness relative to DTC. Analyses examining maintenance of treatment-related gains in the full sample indicated significant or approaching significant improvements for all three variables at program exit and maintenance of treatment-related gains at 2-month follow-up (see Figure 1).

Conclusions:

Findings indicate feasibility, acceptability, and preliminary efficacy of MINDful TIME for improving depression symptoms in autistic adolescents and maintenance of treatment-related gains at a 2-month follow-up. We also found potential sex-specific effects on adolescent anxiety, which should be examined in future studies. Findings warrant future examination of MINDful TIME to support mental health in this population.



424.236 A Comparison of Implementation Strategies for Training Community Providers in a Statewide Rubi Parent Training Initiative

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Background: Community mental health providers receive little training in evidence-based practices for autistic youth and often refer families to specialty clinics with long waitlists (Maddox & Gaus, 2019). One scalable approach to addressing this clinical need is through community provider training in the implementation of parent training programs, which are empirically supported, time-limited, and cost-effective. The Research Unit on Behavioral Interventions (RUBI) program is a parent training program for families of autistic children with quality-of-life impacting behaviors, including meltdowns, aggression, and transition difficulties. RUBI has been found to be acceptable to parents, reliably delivered by trained therapists, and effective in reducing challenging behaviors when evaluated under ideal conditions (i.e., efficacy trials). The current study details a statewide effort to build community provider capacity to serve autistic youth and their families through training in the RUBI Parent Training program. Providers were offered one of three training pathways: 1) access to on demand webinars, 2) participation in a live two-day training, or 3) ECHO RUBI training.

Objectives:

- 1) Explore baseline differences in provider-level factors across training modalities
- 2) Examine immediate and long term (6-month follow-up) impact of training modality on provider knowledge of behavioral principles and RUBI self-efficacy
- 3) Determine provider and training level predictors of gains in knowledge and self-efficacy

Methods: Providers who enrolled in a statewide training effort of the RUBI Parent Training program between October 2022 and October 2024 and consented to research are included in the analyses. Providers completed (1) a demographic questionnaire at baseline, and (2) questionnaires on self-efficacy and knowledge of behavioral principles at baseline, end of training, and 6-months post-training.

Results: Out of the 318 community providers who enrolled in a statewide training for the RUBI Parent Training program, 129 consented to participation in the study (30.6%), with 67 completing pre-, post-, and 6-month assessments to date. A majority of providers are female (83.8%), White (90.8%) and hold graduate degrees (59.2% Masters or higher). Provider education level and sex significantly varied across training modality, with higher rates of providers with graduate level training choosing On-Demand training (75%) compared to the other training options (50% and 52.6%). Additionally, 93% of Live training participants were female compared to 70.8% of ECHO participants. Provider knowledge of behavioral principles and self-efficacy improved significantly from baseline to endpoint across all three training modalities, with no direct effect of training type. There were no significant changes in knowledge of behavioral principles or self-efficacy from Endpoint to 6-month follow-up. Moderator analyses will focus on the impact of training type and provider type on changes in provider knowledge and self-efficacy.

Conclusions: Implementation research provides the opportunity to understand how best to help community providers learn to implement evidence-based treatments, such as RUBI. Community providers across all training modalities demonstrated significant gains in behavioral knowledge and self-efficacy that maintained 6-months post training. Discussion will include a review of barriers to training and implementation approaches that facilitate training of behavioral health providers to improve clinicians' comfort and knowledge related to the implementation of RUBI.

424.237 Predictors of Parental Attendance in an Online Rubi-Based Behavior Support Program

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Background:

The COVID-19 pandemic prompted the adaption of many evidence-based interventions for caregivers of autistic individuals to be delivered in a virtual format. These online versions of parent-mediated interventions for children with autism spectrum disorder (ASD) provide promising results by reducing barriers to participation, with caregivers finding them comparable to in-person programs (de Nocker & Toolan, 2021; Corona et al., 2021). Recent literature, regarding the efficacy and acceptability of telehealth adaptations, primarily cites caregiver and child outcome measures in combination with attendance and attrition rates (de Nocker & Toolan, 2021). However, there is a gap of research investigating predictors of parental attendance in telehealth delivered parent-mediated interventions for ASD.

Objectives:

To explore this question, we investigated how levels of parenting stress, autism symptomology, and severity of non-compliant behaviors predict attendance in an online Research Units in Behavioral Intervention-based behavior support program (RUBI; Bearss et al., 2015).

Methods:

31 caregivers of children 5-13 years old, diagnosed with ASD completed the Parenting Stress Index Short Form, Fourth Edition (PSI-4 SF; Abidin, 1995), the Social Responsiveness Scale, Second Edition (SRS-2; Constantino, 2012), and the Home Situation Questionnaire-Autism Spectrum Disorder (HSQ-ASD; Chowdhury et al., 2016) prior to beginning the eleven-week program. Throughout the program, session attendance was collected and recorded.

Results:

To examine if there was a relationship between session attendance and parenting stress, autism symptomology, and severity of non-compliant behaviors, three linear regression models were evaluated. The SRS-2 total score ($F(1, 25)=.906, p=.351, R^2=.036$), the PSI-4 SF total stress score ($F(1,30)=.028, p=.869, R^2=.001$) as well as the HSQ-ASD total severity score ($F(1,30)=.037, p=.850, R^2=.001$) were all not significant predictors of program attendance.

Conclusions:

These findings suggest that parenting stress, autism symptomology, and severity of non-compliant behaviors were not related to program attendance in a virtual parent-training program. However, due to the small sample size, the study was limited in its power to detect an effect. Future studies may replicate these analyses with a larger sample size to determine which factors may be associated with program attendance and participation.

424.238 Preliminary Feasibility, Acceptability, and Efficacy of the Competence in Romance and Understanding Sexual Health (CRUSH) Curriculum for Autistic Adults

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Background:

Autistic adults identify sexual health as their top unmet healthcare need, including (1) forming healthy sexual relationships and (2) reducing the potential for sexual victimization. To address this need, we conducted a literature review and mixed methods needs assessment resulting in the development of the CRUSH curriculum. Targeting the unique needs of autistic adults, CRUSH is a group-based intervention that facilitates learning new information, increasing motivation and self-efficacy, and developing behavioral skills. CRUSH targets pragmatic language in the context of discussing sexual health constructs as an underlying factor that contributes to learning, self-efficacy, and effective behavior.

Objectives:

Primary goals were examining the feasibility (successful completion of session content and retention across the 20-week intervention) and acceptability (favorable evaluation of content and format). A secondary goal focused on examining initial changes in pragmatic language, knowledge, self-efficacy, and behavior.

Methods:

Participants were eight autistic adults (2 women, 5 men, 1 transgender individual) aged 18-30 with cognitive abilities in the borderline range or above ($FSIQ > 70$). Two facilitators led the CRUSH groups plus participants received 1:1 coaching to individualize content. We assessed pragmatic language, accuracy of sexual health vocabulary, self-efficacy with sexual health behaviors, and behavioral changes at baseline, mid-intervention (10 weeks), and post-testing.

Results:

CRUSH was highly feasible, with all eight participants completing the 20-week curriculum and returning for post-testing. Further, the CRUSH facilitators were able to complete the curriculum content during the intervention period. Acceptability was positive, and group members appreciated the review and synthesis of the previous week's content, the use of visual content and interactive activities, and explicit directions about social aspects of relationships, like flirting. Topics reported as especially important were sex and gender identity, identification of potential partners, consent, and "Sex Ed 2.0." Pragmatic language (defining sexual health terms) improved from baseline to post-testing; group members used less slang, $F(2,12) = 4.5$, $p = .05$, $h_p^2 = 0.43$, and vulgarity, $h_p^2 = 0.07$, with large and medium effects, respectively. Participants had a more accurate sexual health vocabulary as the curriculum progressed, $h_p^2 = 0.15$ (medium effect). They reported feeling more comfort with their current sex life, $h_p^2 = 0.16$, getting and using birth control, $h_p^2 = 0.15$, and more confidence being sexually assertive (e.g., saying "no"), $h_p^2 = 0.13$. Behaviorally, participants reported more efficient and collaborative sexual health decision making, $h_p^2 = 0.06$, and, qualitatively, one participant—who had asked what it means to have a crush on someone at the beginning—was in a relationship by the end. They said, "I have a girlfriend now, which is nuts, and I was actually able to initiate most of that relationship."

Conclusions:

Preliminary investigation of the CRUSH curriculum showed promising initial results, suggesting that it is feasible and acceptable to autistic adults. Results suggest post-intervention changes in pragmatic skills in discussing sexual health, information, motivation, self-efficacy, and behavior relative to baseline. Additional evaluation of curricula like CRUSH that are tailored for the sexual health and relationship needs of autistic adults are needed to address critical gaps in healthcare.

424.239 Project Forward: Internships Focusing on Support for Self-Determination Improve Career Prospects for Autistic College Graduates

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Background: Autistic college graduates in Science, Technology, Engineering, and Mathematics (STEM) are equipped with valuable work skills and professional training to obtain employment in reputable industries. However, due to their social challenges, autistic individuals often cannot obtain employment in line with their professional abilities and are disadvantaged in the competitive job market. With insufficient life experience and career exploration, most autistic college graduates struggle with self-determination, which is critical in enabling autistic individuals to identify their strengths, career aspirations, and effective career-based pathways. Work experience increases autistic individuals' practical skills, helping them gain meaningful employment. However, most employment services target individuals with profound disabilities. Little research thus far has developed supportive internship programs tailored for autistic college graduates with a higher potential to obtain competitive employment.

Objectives: Project FORWARD seeks to develop a supportive internship program in Taiwan that integrates self-determination-focused support and internship opportunities in STEM industries. We examined autistic individuals' career perspectives before and after participating in the supportive internship program.

Methods: We created competitively-paid internship opportunities for autistic college graduates through partnerships with two Taiwanese semiconductor companies. We recruited applicants from eight colleges, providing individualized training in resume writing and job interviews. Eligible autistic individuals then participated in official interviews and obtained a two-month, fully-paid internship. Two hours of employment support were provided weekly during the internship. The employment support involved group discussions focused on the workplace challenges faced by participants, using self-determination strategies to guide and facilitate problem-solving while enhancing their workplace adaptation skills. We conducted semi-structured interviews to understand autistic individuals' career perspectives before and after the internship. Thematic analysis was used to examine participants' narratives about work. Data triangulation and peer debriefing were undertaken to ensure the trustworthiness of the findings.

Results: In total, 14 autistic college graduates participated in Project FORWARD and received resume and interview training (*mean age* = 24.5; *SD* = 2.74). Five individuals successfully matched appropriate internship positions. Nine participants were on the waiting list. All participants exhibited idealized self-concepts toward employability and vague career expectations before entering internships. Individuals who completed the internship shared that they gained a more realistic understanding of work through emerging in the workplace. Instead of blaming external environmental barriers, interns developed concrete action plans to improve their social competencies to fit into the workplace culture. Additionally, interns recognized the gaps between their current abilities and job demands in STEM industries, leading to clearer career plans to enhance their soft skills and professional abilities for future jobs. By contrast, participants on the waiting list hold career perspectives similar to their pre-internship views after two months.

Conclusions: Our study demonstrates a successful model for developing college-company collaborations and creating a supportive internship program in STEM industries. We found that self-determination-focused support with workplace immersion helps autistic individuals adapt to the work environment, develop concrete action plans for job preparation, and establish clear career goals. Our findings suggest that tertiary educators strive to connect with local companies and create more internship opportunities for autistic college graduates.

424.240 Provider Perceptions of Incorporating Special Interests When Treating Autistic Youth

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Background: "Special interests" are an important facet of an autistic person's identity and can enhance well-being (Grove et al., 2018). Incorporating special interests into interventions has the potential for positive change in a variety of outcomes (Harrop et al., 2019). Further, leveraging or capitalizing on an individual's special interest through incorporating it into treatment is an adaptation that has been recommended for autistic youth when using CBT to treat anxiety (Kerns et al., 2017), parent training for disruptive behaviors (McNeil et al., 2018), and increasing social motivation and meaningful social interaction (Vismara & Lyons, 2007). However, it is unclear to what extent community providers actually use (or are even aware of) this strategy in usual care.

Objectives: This study sought to examine community providers' perceptions of their use, the usefulness, and the evidence-base for incorporating special interests when treating autistic youth.

Methods: 674 community-based providers who reported working with autistic youth (aged 7-22) participated in the Usual Care for Autism Study (UCAS; Wainer et al., 2017). Providers who rated (on a 4-point scale) that they were somewhat to very familiar with the therapeutic strategy of 'incorporating special interests' were asked to report their frequency of use, perceived usefulness, and perceptions of how strongly research supports use of this strategy for treating anxiety, externalizing behaviors, and social skills in autistic youth. Repeated-measures ANOVA with a Greenhouse-Geisser correction was used to compare differences across treatment target.

Results: 68.2% of providers reported familiarity with 'incorporating special interests' into treatment. There were significant differences in provider ratings of the frequency of use, $F(1.791,404.687)=18.9, p<.001$, perceived usefulness, $F(1.323,272.510)=4.72, p<.05$, and perceived research support, $F(1.842,279.915)=12.5, p<.001$, for incorporating special interests to treat the different outcome variables. Pairwise comparisons with a Bonferroni adjustment suggest that 'incorporating special interests' is most frequently used by providers when teaching social skills, following by treating externalizing behaviors, and used least frequently when treating anxiety ($p's<.05$; Figure 1A). Similarly, providers believe that there is stronger research support for 'incorporating special interests' to address social skills than externalizing behaviors ($p<.05$) and anxiety ($p<.001$; Figure 1C). Notably, approximately 25-30% of participants indicated a lack of knowledge regarding the research base for incorporating special interests to treat anxiety, externalizing behaviors, and social skills (Table 1). Post hoc tests did not elucidate differences between perceived usefulness by treatment target.

Conclusions: Although most providers reported familiarity with this strategy, the substantive minority of providers unfamiliar with the potential utility of 'incorporating special interests' into treatment highlights the need to investigate provider characteristics associated with this unfamiliarity; and for subsequent training and education of neurodiversity-informed adaptations to treatment. Further, most community providers familiar with this strategy reported frequent use, particularly when teaching social skills, and perceived this to be a somewhat to very useful strategy for treating various outcomes. Yet, the results also suggest a gap in knowledge regarding the evidence base for this strategy, particularly for treating anxiety and externalizing symptoms, underscoring the need for future research on the efficacy, effectiveness, and dissemination of this strategy.



424.241 Robot-Assisted Training Enhances Emotion Recognition in Cantonese-Speaking Children with Autism Spectrum Disorder (ASD) in Audio-Only Contexts

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Background: Children with Autism Spectrum Disorder (ASD) frequently experience challenges in interpreting emotional cues, which can adversely affect their social interactions and communication abilities. Recent studies have integrated robot-assisted training into interventions for ASD, demonstrating positive outcomes in enhancing social skills across various domains. However, research examining the effects of training on the perception of different domains (speech and music) and the integration of modalities (audio-only and audio-visual) remains relatively limited. Additionally, there is a scarcity of research conducted on native Cantonese-speaking trilingual children with ASD.

Objectives: The present study aims to examine the effects of robot-assisted training on emotion recognition across domains (speech and music) and modality (audio only and audio visual) children with ASD. It particularly assesses the efficacy across audio-only and audio-visual presentations. The stimuli include four types: music-only, speech-only, music with dynamic facial expressions, and speech with dynamic facial expressions. The research questions are:

- (1) Does robot-assisted training significantly enhance emotion recognition across different domains and modalities for children with ASD?
- (2) Are there differences in the effectiveness of training for emotion recognition between the audio-only and audio-visual modalities?
- (3) Will the training effects demonstrate emotion-specific differences across domains and modality?

Methods: This study examined the effects of robot-assisted training on emotion recognition in Cantonese-speaking children with ASD. Twenty-seven children with ASD (mean age 9.74 ± 1.50 years, IQ 110.63) and twenty-seven neurotypical (NT) controls (mean age 9.85 ± 1.46 years, IQ 106.07) were recruited. Two participants from the NT group were excluded as outliers. Autistic children participated in two 150-minute robot training sessions, where a robot displayed speech and music conveying six emotions — anger, fear, happiness, sadness, surprise, and tenderness — along with corresponding facial expressions with facial parameters extracted from videos of human actors. Both ASD and NT groups completed auditory-only and audio-visual emotion recognition tasks before and after training for both music and speech domains. Emotion recognition proficiency was analyzed using a mixed-effects logistic regression model.

Results: (1) Significant enhancements in emotion recognition were found in the audio-only settings for both speech and music domains, with autistic participants showing considerable improvement in the accuracy. (2) In audio-only modality, all emotions except “sadness” exhibited significant improvements after training. (3) Although integrating visual cues with audio stimuli generally enhances the performance of participants with ASD across most emotions, training outcomes indicated that individuals with ASD benefited more from audio-only modalities, especially for emotions “anger” in music stimuli and “tenderness” in speech stimuli. In the audio-visual modality, the training did not yield significant positive outcomes for either speech or music.

Conclusions: The research explored the robot-assisted training effects on emotion recognition in children with ASD across different domains and modalities. The results demonstrated that training sessions significantly enhanced emotion recognition in audio-only modality. The absence of significant improvements in the audio-visual modality may be attributed to a “ceiling effect” in emotion recognition accuracy among children with ASD, where their performance did not significantly differ from that of their NT peers.

424.242 School Services That Facilitate Employment Success for College Students with Autism Spectrum Disorders

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Background: Obtaining competitive employment is the final goal for every college student. However, even with the appropriate competency and work skills, autistic young adults are significantly less able to obtain employment than their neurotypical peers. If they are able to secure employment, autistic adults are often in positions that are inadequate with respect to their education levels. To address this issue, school services have become essential in helping college autistic students transition to the workforce. In Taiwan, the Ministry of Education has injected 6.66 million USD yearly for tertiary educators to provide educational services fostering vocational success for college students with disabilities. Tertiary educational institutions in Taiwan are required to develop individual support plans (ISPs) for students with disabilities, and often offer various additional career services as well. However, little research thus far has explored which services successfully support college autistic students in obtaining employment.

Objectives: We sought to identify the school services that best support autistic young adults in their career development and to investigate what factors outside of school could predict the employment status of autistic young adults.

Methods: We surveyed college autistic students to investigate what career services they obtained in school. Prior to data collection, we conducted semi-structured interviews with 24 school teachers at college disability resource centers, 20 college autistic students, and 20 parents of autistic young adults. The survey questions were developed based on the interview results, and then reviewed by four external experts. To ensure content validity, we conducted a pilot test with seven autistic young adults and three neurotypical individuals before finalizing the survey accordingly. In the end, the survey contained three main sections: demographics, background information, and school services to assist student's career development.

Results: In total, 112 college autistic students completed the survey (age mean (SD) = 21.7 (2.8); Male = 81.3%). Most participants (97.3%) had received the basic school services (e.g., ISPs) required under Taiwanese law. However, over a third of (37.5%) students were unaware of the additional career services provided by their university. Among the school services provided, internships arranged by the university were the only significantly effective service to promote employment, controlling for participant age and education level. By contrast, the basic school services did not predict employment outcomes. Furthermore, acquiring the skills for independent commuting enabled autistic young adults to enter the workplace successfully. In particular, motorized mobility (e.g., driving cars and riding scooters) was a stronger predictor of positive employment outcomes than non-motorized mobility (e.g., biking).

Conclusions: Our study demonstrates the importance of job immersion for college autistic students in obtaining employment. Through these opportunities to experience actual workplace culture, autistic students may be able to transition and adjust to a career more easily. Additionally, motorized mobility allows for students to access these opportunities on their own, further fostering their sense of independence. Our findings suggest that local businesses, perhaps with governmental support, should work with universities to ensure that internships are available not only for neurotypical college students but their autistic peers as well.



424.243 Sensory-Friendly Dental Care: Results from a Randomized Controlled Crossover Trial Adapting the Dental Environment to Improve Care for Autistic Children

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Background: Many autistic children experience poorer oral health and greater oral care challenges compared to neurotypical peers; research suggests these are associated with sensory over-responsivity. It is important to identify innovative solutions to improve the dental care experience for autistic children, as well as enable dentists to successfully perform standard clinic-based procedures for this population.

Objectives: To determine if a sensory adapted dental environment (SADE) reduces physiological and behavioral distress in autistic children undergoing dental cleanings, compared to a regular dental environment (RDE). Quality of care, cost, and satisfaction were also examined.

Methods: This randomized controlled crossover trial was conducted at a pediatric dentistry clinic in a large urban children's hospital. Autistic children 6-12yrs underwent two dental cleanings 6mo apart (1 each in SADE and RDE) in a randomized and counterbalanced order. Visual, auditory, and tactile stimuli were modified in the SADE. Outcomes included: physiological stress (electrodermal activity); behavioral distress (dentist-report and coding of video-recordings); resource utilization metrics as cost proxies (duration, staffing); quality of care (scored intraoral photographs), and child/parent satisfaction (1-5pt Likert scale). Mixed effects regression models were performed to assess physiological/behavioral distress; multivariate linear regressions and repeated-measures ANOVA assessed cost and quality measures, respectively.

Results: Autistic children (n=162) had a mean age of 9.16 years and were primarily male (84%), Hispanic (72%), and with expressive language abilities equal to or less than a four-year-old (66%). Significantly lower physiological stress and video-coded behavioral distress were found in SADE vs. RDE (all $p < .05$), suggesting decreased sympathetic activity and increased relaxation during care in the SADE. Findings also support that physiological stress was predictive of behavioral distress during the dental cleaning; age, IQ, and expressive communication moderated the intervention's success. No significant differences were found in cost or quality measures for SADE vs. RDE. High satisfaction was reported by caregivers (M=4.6/5) and children (M=4.2/5) for care in the SADE, with parents stating that the SADE improved child experience (M=4.4/5).

Conclusions: Identifying innovative solutions to enhance oral care is critical for autistic children. This is the first large-scale study, to our knowledge, to examine the efficacy of a SADE to improve dental care for autistic children. Dental cleanings performed in a SADE can be provided at the same quality as in an RDE for autistic children with no additional treatment-related costs, but with greater satisfaction and decreased physiological and behavioral distress. Use of a SADE is relatively inexpensive, scalable, and easy to implement with minimal training. The use of a SADE for children with special health care needs and/or dental fear/anxiety has recently been added to the American Academy of Pediatric Dentistry's List of Behavioral Guidance Best Practices.



424.244 Social Improvements in Autistic Teens: Behaviorally Coded & Computational Linguistic Analysis of Conversation Skills

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Background: Autistic adolescents often experience vulnerabilities in social communication and challenges with establishing desired social relationships with others (Martínez-González et al., 2022). Social skills interventions such as the Social Tools And Rules for Teens (START) program aim to improve social competence and motivation in autistic adolescents and reduce autism-related social communication difficulties (Vernon et al., 2018). Recent advances in computational linguistics, machine learning, and large language models highlight the potential of these tools for objectively quantifying improvements in social function over time. In this study, we use computational linguistics, or computer-assisted analysis of the verbal profiles of autistic adolescents to characterize and objectively assess social growth in autistic adolescents participating in a randomized controlled trial (RCT).

Objectives: The first aim of this study is to evaluate the use of computational linguistics as an effective outcome measure for a completed RCT of the START Program. The second aim of this study is to explore whether linguistic markers of social communication success differ by speaker (male and female) and interlocutor context (same-sex vs. opposite-sex conversations).

Methods: Participants were 35 autistic adolescents (12-17 years old) with verbal IQs greater than 70. The treatment group was composed of 16 participants and the waitlist control group included 19 participants (35 total). Participants attended weekly 90-minute sessions focused on a variety of social skills for 20 weeks. 421 five-minute conversations between adolescent participants and 140 young adult social partners were collected at intake, 5 weeks, 10 weeks, 15 weeks, 20 weeks (post), and follow-up (40 weeks). Conversations were analyzed using (a) behavioral coding for selected social behaviors (i.e. questions asked, positive affect, minimal encouragers, and eye contact) and (b) computational linguistics including text-based metrics, acoustic features, and conversation-based metrics.

Results: Analysis of START RCT outcome data revealed significant Group $\times$ Time treatment effects for overall social impression ratings and multiple verbal and nonverbal social behaviors, including questions asked ($p=.035$), listening behaviors ($p<.001$), eye contact ($p=.003$), and positive facial expressions ($p=.009$). Compared to waitlist controls, analyses also revealed that START participants experienced significant improvements in parent endorsed social communication skills (SSIS-parent, $p<.001$), autism symptoms (SRS-2, $p<.001$), and teen self-endorsements (SSIS-self $p=.011$). Preliminary linguistic analyses showed that adolescents who participated in the START Program produced more friend-related words, second-person pronouns, and saw increased stability in their voices post-intervention. Linguistic analyses are ongoing and will be complete by May 2025.

Conclusions:

Behavioral coding and preliminary computational linguistic analyses both yielded evidence of increased reciprocal interest/engagement (i.e. question asking, friend-related word use, second-person pronoun use) and enhanced overall comfort (i.e. positive affect, increased voice stability) after participation in the START Program. This overlap suggests that the use of computational linguistics may be effective for measuring improvements in social outcomes and highlights the potential for this tool to be used to tailor interventions to the unique needs of autistic individuals.



424.245 Depression and Anxiety Symptom Change during Psychological Therapy for Autistic Clients: Evidence from National Healthcare Records in England

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Background: Autistic people appear less likely to benefit from currently-recommended mental health treatments. Intervention development and adaptation is hampered by a lack of knowledge regarding whether subgroups of autistic people differ in their degree of risk, and what characterises subgroups of autistic people who respond differently to interventions.

Objectives: This study aimed to be the first to 1) identify trajectories of depression and anxiety symptoms during routine psychological therapy for autistic people, 2) describe the characteristics of groups that followed particular symptom trajectories, and 3) calculate the odds of following different types of symptom trajectory, based on pre-treatment risk factors.

Methods: Sessional anxiety and depression symptom scores for N=7,175 autistic individuals accessing National Health Service Talking Therapies for anxiety and depression (NHS TTad) services between 2012-19 across England were drawn from a linked, national healthcare record dataset (MODIFY). Growth Mixture Modeling (GMM) is a data-driven statistical approach that identifies relatively homogeneous subpopulations within heterogeneous data, resulting in distinct longitudinal trajectories. GMM models were estimated for depression (Patient Health Questionnaire-9) and anxiety (Generalised Anxiety Disorder-7) symptom severity change over eight psychological intervention sessions. Latent trajectory classes were described in relation to demographics (gender, age, ethnicity) and pre-treatment clinical variables (psychotropic medication, long-term health condition, Intellectual Disability and functioning - Work and Social Adjustment Scale).

Results: Seven different anxiety trajectories, and five depression trajectories were observed. Groups showed stable, improving or deteriorating symptoms during treatment. Trajectories became clearly distinct by the third treatment session. Lower pre-treatment global functional impairment was associated with likelihood of following trajectories defined by initially severe depression and anxiety symptoms that improved during treatment, relative to trajectories showing limited improvement in severe clinical ranges [OR(95%CI) = .91(.86 - .96); .93(.89-.97)]. Lower pre-treatment impairment in social leisure activities was associated with likelihood of either rapid or gradual anxiety improvement, compared with a trajectory showing limited improvement in the severe clinical range [OR(95%CI) = .76(.69 - .83); .85(.78-.93)]. Identifying as belonging to an ethnically-minoritised group was associated with increased likelihood of deteriorating anxiety symptom trajectories during treatment compared with trajectories showing limited improvement in severe or moderate clinical ranges [OR(95% CI) = 2.66(1.24-5.68) 3.83(1.34-10.96)]. Female gender, older age, presence of an Intellectual Disability diagnosis and psychotropic medication use were associated with likelihood of following trajectories showing limited improvement, in mild or moderate clinical ranges.

Conclusions: Pre-treatment impairment in global functioning and social leisure was associated with lower odds of benefiting from mental health intervention. Belonging to an ethnically-minoritised group was associated with higher odds of deteriorating anxiety during treatment. Findings highlight the value of examining early change in treatment response, and identifying individuals at risk of poorer outcomes before treatment has begun. After the third treatment session, clinicians could identify a likely change trajectory and consider adapted or augmented intervention if there is no improvement. Interventions should be adapted on the basis of individuals' cultural backgrounds and autism. Augmented intervention approaches that address social and functional impairment may be promising in improving treatment outcomes for autistic people.



424.246 Social Skills Improvements in Autistic Youth: A Pilot Study of the Superflex Curriculum and Minority Status Differences

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Background: Social differences, a well-established autistic trait (APA, 2013), may influence interpersonal relationships, academic achievement, and psychological well-being (Silveira-Zaldivar et al., 2021), with evidence showing that Black and Latino autistic children experience greater social isolation than their White peers (Azhad et al., 2017). Certain interventions may be less effective for minority groups due to cultural mismatches, highlighting the need for culturally responsive approaches to maximize their impact (Smith et al., 2011). The Social Detective/Superflex (SD/S) curriculum series is a social skills intervention that is widely disseminated across school and clinic settings and is endorsed by professionals (Yadlosky, 2012). While recent efforts have been made to enhance the inclusivity of SD/S (e.g. updating materials to better reflect diverse groups), the impact of children's minority status on changes in social skills from the SD/S remains unexplored.

Objectives: This pilot study examines the impact of minority status on social skills outcomes across SD/S. We predicted that caregivers of children from a minority background would report less change compared to caregivers of White Non-Hispanic children.

Methods: As part of a larger study, seven autistic children (Table 1) participated in SD/S, which met weekly for 20 weeks at a university laboratory. Caregivers' reported child demographic information (e.g., age, sex, race/ethnicity) and pre- and post-intervention social skills (Social Skills Improvement System Social Skills subscale (SSIS), child use of SD/S vocabulary). Pre- and post-intervention social skills scores were compared using t-tests. Linear regression was conducted to assess the influence of minority status on changes in social skills, controlling for age and sex.

Results: Parent-reported social skills (SSIS and child use of SD/S vocabulary) significantly improved from pre- to post-SD/S (*p-values* < 0.035; Table 1). Minority status significantly predicted changes in social skills (i.e., minority children experienced less improvement), controlling for age and sex, on the SSIS ($B = -16.00, p = 0.007$ (Figure 1)) and in report of children's use of SD Vocabulary ($B = -1, p < 0.001$), but not Superflex Vocabulary ($B = -0.25, p = 0.85$).

Conclusions: Caregivers reported significantly improved social skills outcomes for autistic children that participated in SD/S. However, children from a minority background experienced less improvement in social skills (SSIS and Social Detective Vocabulary) compared to their White peers. Interestingly, minority status did not predict changes in Superflex Vocabulary use. This difference may result from recent updates to the Superflex materials, which are more current and potentially more culturally responsive than those of Social Detective. However, further research with larger and more diverse samples is necessary, as the disparity may indicate SD/S curriculum does not fully account for cultural norms and communication styles, leading to less effective implementation and parental lower perceived gains in social skills. This study is limited by its small sample size and single-group pre-post design, highlighting the need for further with larger samples and randomized experimental designs. Recognizing minority status differences underscores the importance of considering racial/ethnic factors in social skills interventions, guiding future adaptations of SD/S to be more effective for diverse autistic youth.

424.247 Solution-Focused Brief Therapy for Autistic Young Adults

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Background:

Autistic adults often face significant challenges in accessing appropriate behavioral health interventions, which can lead to increased mental health difficulties, including anxiety, depression, and suicidality. Despite the clear need, there is a notable gap in research on evidence-based behavioral health strategies tailored specifically for autistic adults. Solution-focused brief therapy (SFBT), with its strengths-based and goal-oriented framework, holds promise as a viable intervention for this population. However, little research has explored the efficacy of SFBT in autistic adults. For this study, we adapted the SFBT protocol based on clinical expertise and lived experience and piloted it with autistic adults.

Objectives:

For this analysis, our aim was to examine the feasibility and acceptability of the SFBT. Specifically, whether participants can be recruited and engaged in all sessions; and the usefulness of the intervention to them.

Methods:

We convened a team of researchers, social work clinicians who had experience working with autistic adults, students, and an autistic adult researcher to adapt the SFBT protocol. We worked with a community organization that serves autistic young adults to recruit five participants. Participants were four female and one male, and their ages ranged between 18 and 29 years old. We conducted four-weekly individual SFBT sessions with five autistic adults, followed by 45-to-60-minute post-intervention interviews that included open-ended questions. Using a phenomenological approach, we explored participants' overall experiences, helpful or challenging aspects, and suggestions for improvement through semi-structured interviews. Three interviews were audio-recorded and transcribed verbatim; two were manually transcribed. Thematic analysis identified key themes, supported by participants' direct quotes. An audit trail documented the entire analytic process to ensure rigor.

Results:

All five enrolled adults participated in pre and post interviews, and all four therapy sessions, demonstrating strong feasibility. Thematic analysis revealed four key themes: lessons learned by participants, helpful aspects, challenging aspects, and improvement suggestions. Participants reported positive experiences with SFBT, describing sessions as "helpful", "hopeful", and "made me feel happy". Lessons they learned included feeling empowered, stronger motivation to practice independent living skills, and deeper insights into their identities as autistic individuals. Participants expressed a desire to pursue changes in various life domains, including career, hobbies, and social circles. Participants identified helpful aspects as follow: Opportunities to reflect on self-identity, breakdown of the goal into smaller achievable tasks, and a strength-based approach that draws on participant's existing resources. Challenging aspects included difficulty understanding questions, inability to address structural issues, and logistical challenges, such as time constraints and transportation difficulties. For future improvements, participants suggested increasing the number of sessions, implementing more structured goals, and adopting a more individualized approach incorporating their special interests.

Conclusions:

Our study found that SFBT holds potential to be a viable intervention for autistic adults. SFBT's strength-based and goal-oriented framework was found to support the participants' exploration of self, a necessary step in effective mental health support. Further research is needed to examine the effectiveness of SFBT with this population.

424.248 State of the Science on Peer-Facilitated Interventions for Autistic People

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Background:

Autistic people report high rates of unmet support needs. Some autistic adults find it difficult to connect with non-autistic supporters, who may have little education about or hold stigmatizing views of autism. Several studies suggest that autistic people learn well from other autistic people and benefit from hearing their experiences reflected and sharing information and solutions to common issues. Peer-facilitated interventions (PFIs) are provided by a person with lived experience with a condition and can include outreach, skill building, health coaching, case management, system navigation, or psychoeducation. PFIs could be a promising innovation for addressing the support needs of autistic people.

There is a large body of evidence for the effectiveness of PFIs for people in recovery from substance use disorder or mental health challenges. They are widely used across the mental health and veterans' health systems and considered an essential mental health service by the World Health Organization. PFIs have been shown to reduce inpatient hospitalization, substance use, social isolation, model community living, enhance social networks, and improve adherence and participation in treatment for non-autistic people.

Objectives:

To date, it is not clear whether PFIs are feasible, acceptable, or effective for autistic people. Some providers have expressed uncertainty about whether PFIs could be effective for autistic people. The objective was to review research on PFIs for autistic people and make recommendations for future research and practice.

Methods:

Using PRISMA guidelines, we conducted a scoping review of the English-language, peer-reviewed published articles on PFIs for autistic people of all ages. PFIs were defined as those in which at least one autistic person delivered the intervention to other autistic people, and an autistic facilitator was chosen based on their lived experience or autistic characteristics being expected to contribute to the efficacy of the intervention versus for other reasons such as proximity (e.g., in peer-mediated interventions in special education settings). Both formative research and tests of interventions were included.

Results:

We identified 4,157 studies, removed duplicates, and screened the remaining 1,561 studies. Of the articles reviewed, 15 met criteria for inclusion (see Table 1). Of these, 5 were formative research to inform development of a PFI, 9 were evaluations of PFIs and 2 were both formative and evaluation. All used community-engaged methods with autistic people in an advisory capacity (n=6) or engaged in co-production (n=9).

Intervention targets were diverse, including social or communication (n=9), improving mental health (x=2), improving cognition or executive function (n=1) or other targets (n=3) with secondary targets focused on well-being or quality of life for several studies. The intervention studies reported preliminary evidence of feasibility and efficacy. Both intervention studies and formative research reported a high degree of acceptability of PFIs.

Conclusions:

PFIs are a promising approach for meeting the needs of autistic people in a cost-effective, accessible, and acceptable manner and can be eligible for Medicaid reimbursement. Research gaps include stronger trial methods using comparison groups, methods for training and supervision of peer support specialists, and implementation of PFIs across different settings.



424.249 Study Retention in School-Based Autism Intervention Research: Factors Related to School Provider Attrition

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Background: An estimated 40% of autistic youth develop co-occurring anxiety (van Steensel et al., 2011), which can negatively impact experiences at school, with peers, and at home (Reaven et al., 2020). Schools are viewed as an important resource for identifying and addressing anxiety in autistic students (Adams et al., 2019); however, school providers often feel underequipped (Reyes et al., 2022), strained (Kerr & Brown, 2016), and in need of specific resources (Kester & Lucyshyn 2019). Despite evidence of a desire for training in evidence-based anxiety interventions for autistic youth, attrition is high in the field of special education and school providers face barriers (e.g., high burnout) to implementing EBPs (Billingsley & Bettini, 2019; Suhrheinrich et al., 2021). The current study explores characteristics of interdisciplinary school providers (ISPs) who withdrew from a school-based comparative-effectiveness trial, to determine potential barriers to ISP participation, which can inform future implementation research.

Objectives: Examine differences between ISPs who remained versus withdrew from a comparative effectiveness trial, including measures of stress and burnout, leadership support and implementation climate.

Methods: Interdisciplinary elementary and middle school providers (N=128) were enrolled in an ongoing cluster randomized controlled type 1 hybrid-effectiveness trial comparing the effectiveness of two school-based anxiety interventions, *Zones of Regulation* (ZOR; Kuyper, 2011) and *Facing Your Fears in School* (FYF-S; Reaven & Blakeley-Smith, 2024) for autistic students (Table 1). ISPs were degreed providers in any discipline working with autistic students (e.g., school psychologists; special educators). ISPs completed the following: Emotional Exhaustion subscale of the *Organizational Social Context Questionnaire* (Glisson et al., 2008), *Implementation Leadership Scale* (Aarons et al., 2014), and *Implementation Climate Scale* (Ehrhart et al., 2014), were randomly assigned to ZOR or FYF-S, and completed program-specific training. Post-training, ISPs were asked to deliver the assigned program to a small group of autistic students. Timing and reason for ISP study drops were tracked. Due to uneven group sizes, Welch t-tests were used to assess significant differences between ISPs who withdrew (N=27) and those who remained (N=101).

Results: See Figure 1 for reported reasons for study dropout. Welch t-tests revealed a significant difference in years of experience ($t(44.96)=7.42$, $p<.01$) between ISPs who dropped (mean=6.06 years; SD=6.11) and those who remained (mean=10.12 years; SD=8.15). There was also a significant difference in burnout ($t(21.87)=5.20$, $p<.05$) between ISPs who dropped (mean=12.5; SD=3.31) and those who remained (mean=10.42; SD=3.65). There was no significant difference between ISPs in their reported implementation climate or leadership.

Conclusions: Consistent with the literature (Suhrheinrich et al. 2021) ISPs were more likely to drop out from the study when they had fewer years of experience and higher levels of stress and burnout. Implementation climate and leadership did not differ between groups. These findings suggest that working to reduce stress and burnout among school providers and providing increased support for early career school professionals may help remove barriers for successful inclusion in research that could help inform evidence-based interventions (Locke et al., 2024a; Locke et al., 2024b).



424.250 Summer Program for Asian Autistic Youth: Program Development and Examination of Initial Efficacy and Social Validity
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Background: Asian autistic youth is growing yet no studies explored this population. During summer break, autistic youth and families often experience isolation and stress due to lack of community-based programs. While there is some research on summer programs for autistic youth, the program component and outcomes may not be generalizable to Asian communities who come from collectivistic culture.

Objectives: The study addressed the following research questions. 1. What are the characteristics of the Asian autistic youth who participate in a 6-week long summer program? 2. How do they engage in social interaction and discussion during the program? 3. How do parents perceive the social validity of the summer program?

Methods: The summer program was a 2 hour/week, 6-week long program that supported emotion regulation, sportsmanship, interpersonal skills, conversational skills, and friendship skills through literacy, arts, board game, gross motor game, and free play. Each staff member was assigned with two youths to provide behavior support. 19 youth and 10 staff participated in the program. 13 parents/14 youth consented to participate in the surveys/interviews. Youths' age ranged from 5-12 years and were predominantly bilingual Asians. A pre-program survey was completed by the parent. Staff collected data on youth behaviors during the social activities and discussion. Parents completed the Treatment Acceptability Rating Scale and an interview to evaluate the social validity of the program after the last session. Descriptive analysis was conducted with the demographics, youth behaviors, and parent questionnaires. Two coders engaged in iterative coding of interview transcripts to identify emerging themes.

Results: The Asian autistic youth had moderate levels of autism based on the Autism Symptoms Dimensions Questionnaire (M=2.93 out of 5) and the quality of their peer relationship was low based on the Parent-reported Peer Relations Questionnaire (M=32.3 out of 80). The greatest changes in youth behavior were (1) sharing an idea (M=21.9%, of the time W1 to 40%, W5); and (2) making comments to a peer/staff's idea (M=16.5%, W1 to 29%, W5). The frequency of social skills showed greatest improvement after staff's verbal/gestural prompt (M=62, W1 to 85.5, W5). 72% parents believed the program aligned with children's goals. 57% believed the program made long-term positive impact. Parents shared, "This kind of opportunity is rare. It is beneficial for children who feel comfortable in a small group.", and "It gives us [parents] a little bit of a break.", "It was great that this was specifically for special needs kids ... It helped with social behavioral skills." and "We come from different cultures, different ways of raising your kids We're all in the US, but in our homes, we might be slightly different."

Conclusions: Summer program for Asian autistic youth is rare and beneficial for both youth and parents. Future research could explore cultural adaptation of the program to create more inclusive and meaningful social interaction opportunities. Measurement/assessment of youth behaviors during sessions could be standardized to evaluate the impact of the program on youth outcomes.

424.251 Supporting Hygiene and Social Safety through a Parent-Led Sexual Health Education Program for Autistic Youth
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Background: While most youth experience some difficulties adapting to the changes of their bodies during puberty, autistic youth may face heightened challenges in understanding and addressing hygiene needs and social demands that arise in the teenage years (Corona et al., 2016). Parents are well-positioned to provide coaching on topics related to the teenage years to their children; however, there are limited resources for caregivers of autistic youth (Cosgrove et al., 2024) and providers often neglect puberty-specific challenges (Larson et al., 2021). Although two of the most important topics for parents include caring for changing bodies and social safety (Nichols & Blakeley-Smith, 2009), there is little research examining specific parent goals in this area and support needs. Moreover, it is relatively unknown if parent-led programming can yield greater independence in these areas. It is important to understand which hygiene and social safety skills are most important for parents at the time of program delivery as this will allow interventions to be better tailored to parent needs.

Objectives: The main goal of the present study was to examine the most common pre-intervention parent goals. An exploratory goal was to determine if there were individual changes in hygiene skill acquisition pre-post intervention for a small subsample of participants.

Methods: The present subsample includes nine parents of cisgender male youth between the ages of 10-18 ($M = 12.05$ years). Parents were participating in a larger, randomized controlled trial comparing a novel parent-led sexual and reproductive health education (SRE) program, Birds & Bees, to a widely available SRE resource guide. Only parents randomized to receive Birds & Bees complete the Parent Goals interview, a brief 20-minute interview to identify individualized goals from a pre-determined list of possible outcomes, modeled after Goal Attainment Scaling (GAS; Ruble et al., 2012). Parents indicated the level of support their child needed for each skill area and rated their top three goals for their child pre and post intervention (see Table 1 for scoring). Complete data will be available by December 2024.

Results: Youth in the sample showed the most independence with wearing undergarments and oral hygiene. They showed the least independence with deodorant use. See Figures 1 and 2 for top priorities related to hygiene and social safety, respectively. Post intervention, a third of teens showed greater independence in at least one of the following areas: Deodorant use, Shaving, and Oral Hygiene. Over half of participants at post reported increased conversations regarding social safety and utilizing additional strategies (e.g., resources, teaching skills, etc). Complete results are forthcoming.

Conclusions: Functional outcomes are important to include in newly developed interventions, particularly when youth are the target of the intervention, but are not directly involved in the delivery. Results indicated that parents have many overlapping concerns in SRE skill development and even if youth are independent in the specific skill, the quality and frequency of use is important to parents. Based on a small subsample, there are some changes to youth independence in hygiene skill acquisition from pre to post intervention.



424.252 Supporting Inclusion and Belonging for Autistic Students: A Pilot Study of a Peer Educational Program in the Early School Years

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Background: Social inclusion and belonging are fundamental to well-being. Autistic students are at high risk for experiencing social exclusion, which negatively impacts their learning and well-being. Educational interventions aimed at increasing classmates' understanding of autism might support inclusion and belonging.

Objectives: Through this feasibility and pilot study we: (1) co-designed a feasible (time, training, cost), peer-focused, educational intervention intended to improve peer understanding, engagement and inclusion of autistic students, and (2) evaluated outcomes of the intervention on (a) peer engagement between autistic and other students, and (b) perceptions on inclusion, operationalized as belonging, acceptance, and valuing of autistic students.

Methods: Two classes of students at two different elementary schools participated. A weekly, 40 minute intervention was completed with each class over three weeks. Each session consisted of reading a book with a diversity awareness theme, a facilitated discussion, and a related creative activity. Interventions were led by the researcher, an occupational therapist who also has an autistic child. As such, her personal stories were also integrated into discussions with students and activities. The discussions covered general awareness of diversity, how autistic and non-autistic people can work together, and finding common ground. Photographs of student work were collected. Semi-structured interviews were completed with classroom teachers ($n=2$), educational assistants ($n=3$) and selected students ($n=10$). The interviews were recorded, transcribed and, along with students' work and reflexive memos, were analyzed through a process aligned with reflexive thematic analysis.

Results: Preliminary themes include: (1) *Good citizen vs. good friend* - students' intentions shifted from a charity and service mindset to one of connection; (2) *"That's just autism"* - students began to understand autistic behaviour as just another way of being, and began to more positively reframe their perceptions of their autistic peers; (3) *Permission to address the "elephant in the room"* - students felt that the intervention gave them permission to talk frankly about autism, which allowed them to develop a fuller understanding of their autistic peers; (4) *"I thought it was just me"* - through an exploration of diversity, students discovered that many (non-autistic) peers felt "different" in one way or another. Acknowledgement of the universality of these feelings led to new and more authentic social connections across the class as a whole, (5) *Lived experience as an active ingredient* - students discussed the researcher's personal stories frequently during the interviews, and (6) *"I could use that"* - staff developed new skills and approaches to support community development and inclusion in their classrooms that they planned to use in the future.

Conclusions: A short educational intervention with peers supported a shift in attitudes and understanding towards autistic peers and each other in an inclusive elementary classroom. The influence of the intervention on the experience of belonging for autistic students was less apparent. Lived experience may be a key component of interventions that target attitude and behaviour change.

424.253 Teachers' Experiences Implementing Time2Connect As a Strategy to Build Positive Relationships with Autistic Students

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Background: Student-teacher relationships characterized by warmth and open communication promote students' social integration, emotional and behavioral adjustment, and academic engagement (McGrath & Van Bergen, 2015; Losh et al., 2022). However, relationships between autistic students and their teachers are often characterized by low levels of closeness and high levels of conflict (Blacher et al., 2014, Zee et al., 2020). There is a need for feasible strategies to improve such relationships.

Objectives: As part of a larger autism-focused professional development (PD) program, *Smooth Sailing*, teachers were taught to engage in Time2Connect (T2C) sessions, short (3-10 min), one-on-one interactions with a focal autistic student during the school day. T2C incorporates evidence-based strategies to promote positive student-teacher relationships and is child-led, non-directive, and communicates teacher enthusiasm about the students' interests. The purpose of this study is to understand teachers' experiences using T2C. We examined (1) teachers' implementation of T2C strategies, including their frequency and maintenance, (2) teachers' perspectives of the feasibility and acceptability of implementing T2C, and (3) teachers' perspectives of the benefits of T2C.

Methods: Twenty-one teachers participated with an autistic focal student in their classroom (29% teachers of color, 62% students of color). Teachers taught general education classes in kindergarten (76%), first grade (5%), or second grade (19%) in MA (29%) or CA (71%). Teachers were asked to implement T2C sessions 3-5 times/week during their participation in the larger 4-week PD program; their frequency of usage during the program and their maintenance of T2C sessions after the program was monitored through teacher-report surveys (Aim 1). Throughout the program, teachers reported on T2C's feasibility and acceptability (Aim 2) and answered open-ended questions about how their student responded to T2C and what they learned about the student (Aim 3). We conducted a thematic analysis of the open-ended responses.

Results: All teachers implemented T2C sessions (mean: 9.45, range: 1-50), at an average of 3 sessions per week (range: 1-10). All teachers reported fully or partially using the learned strategies (following the child's lead, descriptive commenting, and shared enthusiasm) and 97-100% of teachers reported fully or partially avoiding directives, academic instruction, and asking questions. 76% of teachers reported avoiding questions to be a challenging T2C strategy to implement.

For feasibility and acceptability, all teachers rated T2C as helpful and effective and 90% of teachers agreed or strongly agreed T2C helped them get to know their student. Some teachers (40%) found it difficult to schedule T2C sessions, yet, all teachers planned to continue to implement T2C with the focal student and other students. Preliminary thematic analysis showed T2C provided opportunities for students to show more of themselves and allowed teachers to develop a more nuanced appreciation of their students' strengths. After T2C, teachers noted improvements in the students' comfort in the classroom. Full analyses are ongoing.

Conclusions: Results suggest T2C is a promising approach for K-2 general education teachers to get to know their autistic students, recognize their students' interests and strengths, and to ultimately reduce conflict and promote closeness between autistic students and their teachers.

424.254 Teaching Autistic Students Using Robot Assisted Instruction

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Background: Technology-Aided Instruction has been rated as an evidence-based practice for autistic students (Steinbrenner et al., 2020). Following technological advances, there have been increased investigations using robot assisted interventions (Kumazaki et al., 2020). Robot instruction leverages autistic preferences, desire for predictability, repetition, etc., while increased engagement and short-term improvement of several skills has been noted as an intervention outcome (Gómez-Espinoza et al., 2024; Holeva et al., 2022). Despite these successes and technology's potential, well known barriers exist. These include minimal intervention length, small sample size, lack of standardized implementation, focus on clinic settings, etc. (Santos et al., 2024; Yuan et al., 2021).

Objectives: This exploratory study is the first step in a multi-phase project. Our study objectives are to 1) determine the feasibility and effectiveness of using a robot assisted curriculum with autistic students in school settings, and 2) understand stakeholders' perceived implementation successes and challenges.

Methods: Over a 6-month period, we implemented a mixed methods approach in a public school in Southern New England. We collected observation data on the conversation skills of 7 autistic students (ages 6-13) across a multiple baseline design. We collected descriptive data to track participant use of the Robokind robot (Milo) and curriculum (conversation skills module) including engagement, time used, quiz scores, etc. A facilitator guided students through lessons using Milo and an iPad. Qualitative interviews were conducted with students, families, and teachers at the conclusion of the study.

Results: Students used Milo for an average of 17 minutes per weekly session while lessons averaged 6 minutes. While most students increased conversation skills from baseline to intervention phases, no causal relationship between variables was observed. Feedback from stakeholders was mixed with generally positive comments. While most students enjoyed using Milo, one student withdrew from the study due to boredom.

Conclusions: Robot assisted instruction was observed to be feasible in a school setting as it took minimal time and facilitator training, and students were rated by observers as typically highly engaged. All stakeholders were very willing to try this technology in a school setting. While promising, more research is needed to address limitations. In the next phase of this project, a rigorous single case design will be implemented with a more diverse student population.

424.255 6-Month Follow-up Outcomes of CBT Practices in Treating Anxiety in Autistic Children

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Background:

Anxiety is a common co-occurring challenge among autistic children that often interferes in several domains including home, school, social settings, and daily living. While both standard and adapted practices of cognitive behavioral therapy (CBT) are found to be efficacious in addressing anxiety among autistic children, adapted CBT practices have been shown to be more efficacious in reducing anxiety levels, as well as in addressing emotion regulation, social communication, and adaptive functioning. At present, less is known about the longer term outcomes of both standard and adapted CBT practices in supporting anxious autistic children.

Objectives:

The present study is a secondary data analysis of a multi-site randomized clinical trial that compares the longer-term outcomes of adapted and standard CBT practices in addressing clinically significant anxiety and social communication challenges among autistic children through the following questions: 1) Does adapted CBT produce superior outcomes to standard CBT at the 6-month follow-up? and 2) Do both groups (i.e., standard and adapted CBT) maintain treatment outcomes from post-treatment to 6-month follow-up?

Methods:

In the original study, volunteer participants ($N = 167$), between the ages of 7 and 13, and their families were recruited from 3 cities in the US, and were randomized to receive 16 weekly sessions of adapted CBT, standard CBT, or treatment as usual. Participants randomized to adapted CBT or standard CBT were administered follow-up measures 6 months following active treatment.

The Pediatric Anxiety Rating Scale (PARS; RUPP, 2002), an independent evaluator clinician-rated scale, was used to measure anxiety. The Social Responsiveness Scale–Second Edition (SRS-2; Constantino & Gruber, 2005), a parent-reported scale, was used to measure social communication challenges. Both measures were administered at baseline, mid-treatment, post-treatment, and 6-month follow-up.

In line with the primary data analyses, general linear mixed models (GLMMs) were utilized to compare the longer-term outcomes of both adapted and standard CBT in addressing anxiety and social communication challenges from baseline to 6-month follow-up, as well as the stability, from post-treatment to 6-month follow-up.

Results:

Condition (i.e., adapted CBT, standard CBT) was significantly associated with the outcome variable on the scale for anxiety, PARS ($b = 0.297$, $SE = 0.141$, $t = 2.082$, $p = .037$, 95% CI [0.017, 0.571]), as well as the scale for social communication, SRS-2 ($b = -0.148$, $SE = 0.066$, $t = -2.259$, $p = .025$, 95% CI [-0.278, -0.019]). There were no significant differences between conditions from post-treatment to 6-month follow-up in the scales for anxiety and social communication ($p = .441-.519$).

Conclusions:

While both groups (i.e., adapted CBT, standard CBT) demonstrated lower levels of anxiety and social communication challenges during the 6-month follow-up, adapted CBT outperformed standard CBT on both scales, suggesting the potential advantages of a modular-based, personalized CBT approach in addressing the specific challenges experienced by anxious autistic children.

424.256 The Effectiveness of an Adapted Psychological Intervention for Depression for Autistic Adults: The Autism Depression Trial (ADEPT-2)

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Background: Autistic people are disproportionately affected by depression. Evidence based psychological treatments for mild-moderate depression include low intensity cognitive behavioural therapy (CBT). Low intensity CBT for depression ordinarily comprises provision of evidence-based information with support from a therapist and is widely available in the UK healthcare context. However, it was not developed specifically for autistic people who can experience difficulties accessing standard psychological treatments. A low-intensity CBT intervention (Guided Self-Help: GSH) was developed in collaboration with autistic advisors (Russell et al., 2020). A pilot RCT demonstrated GSH was acceptable and feasible and warranted further investigation in respect of effectiveness.

Objectives: This study reports the results of a two parallel group multi centre pragmatic randomised controlled trial (RCT) (ISCRTN 17547011) conducted in UK statutory healthcare services investigating the effectiveness of GSH.

Methods: To test effectiveness, 266 Autistic adults (≥ 18 years) eligible and consenting to participate in the study were randomised to GSH or Treatment as Usual (TAU). TAU was described as NHS support for depression and is carefully characterised during the study. Randomisation was stratified according to baseline Beck Depression Inventory (BDI-II) score, trial centre and anti-depressant medication. Participants randomised to GSH were provided with intervention materials and offered 9 individual sessions delivered remotely with a therapist coach who had received training in the intervention. All participants are followed up at 16-, 32- and 52-weeks post-randomisation. The primary outcome is the BDI-II score at 16 weeks. Secondary outcomes include self-report measures of depression, anxiety, work and social adjustment, quality of life, patient rated global outcome and health and social care resource use. A public and patient involvement and engagement (PPIE) group are involved in the design, conduct and reporting of the study.

Results: The RCT has recruited above target (266/243 (109%). Thirteen participants withdrew from the study to date. Of 132 participants allocated to GSH, 109 (82%) completed the intervention. Follow-up rates at 16 and 32 weeks are 89% and 80% respectively with final follow-up of 52 weeks currently at 80%. We will report on the primary intention-to-treat analysis comparing BDI-II scores at the 16-week follow-up between the groups as allocated

Conclusions:

The results of this study will help us to understand if evidence-based psychological interventions adapted for autistic people can be effective when delivered in routine care. Issues relevant to implementation will be considered based on the findings.



424.257 The Effects of Internalizing Symptoms on Adolescent Outcomes of the PEERS® Intervention

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Background: The Program for the Education and Enrichment of Relational Skills (PEERS) is effective at improving social skills of autistic youth. However, few studies have examined the suitability of PEERS for youth with comorbid mental health concerns. Research suggests that autistic youth are highly likely to have co-occurring disorders (Simonoff et al., 2008), especially internalizing disorders, such as anxiety and depression (Greenlee et al., 2016; Hudson et al., 2019; Van Steensel et al., 2011). Comorbid internalizing disorders are linked with poorer social skills in autistic youth (Ambrose et al., 2021).

Objectives: This study explores the effects of internalizing symptoms (IS) on outcomes of the PEERS intervention by examining the relationship between IS and 3 composite outcome variables (i.e., social awareness, social interaction, social communication) before and following the intervention.

Methods: 61 autistic youth ages 11–17 ($M=13.54$, $SD=1.31$; 86.89% male) who completed the PEERS program were included in the analysis. Caregivers completed the Child Behavior Checklist (CBCL; Achenbach, 2001), Social Responsiveness Scale (SRS-2; Constantino & Gruber, 2012), Social Skills Improvement System (SSIS; Gresham & Elliott, 2008), Test of Adolescent Social Skills Knowledge (TASSK; Laugeson et al., 2009), and Social Communication Questionnaire (SCQ; Rutter et al., 2003).

Meaningful Grouping, which uses non-statistical methods to group variables based on the interpretation of variables' meanings, was used to create composite outcome variables (Song et al., 2013). This allows outcome measures assessing similar domains to be grouped, allowing for a broader understanding of changes in social functioning. Composite outcome variables were calculated using the average of z-score transformations of the standardized original scores produced by each of the variables comprising the composite (see Table 1 for groupings).

Results: Paired-samples t-tests examined changes between pre- and post-intervention timepoints for three composite variables. All showed an increase from pre- to post-treatment, indicating improvement in social skills (Awareness: $t(51)=-9.38$, $p<.001$; Cohen's $d=1.30$; Interaction: $t(51)=-5.36$, $p<.001$; Cohen's $d=.74$; Communication: $t(51)=-5.08$, $p<.001$; Cohen's $d=.70$).

Hierarchical regression was conducted to predict participants' awareness, interaction, and communication at pre- and post-treatment. If indicated, covariates (e.g., gender, IQ, autism severity, medication status) were included in the first step, and IS (CBCL Internalizing Problems) was included in the second step of the model for pre-intervention analyses. When examining post-treatment outcomes, pre-intervention composite scores were included in the first step of the models. Complete results of the hierarchical regression models can be found in Table 2.

At pre-intervention, IS was a marginal predictor of awareness, whereas at post-intervention, it was non-significant. For interaction, IS was a significant predictor at pre-intervention, but only a marginal predictor at post-intervention. Lastly, IS was not a significant predictor of communication at either timepoint.

Conclusions: Findings indicate that the composite variables are sensitive to change between timepoints. Although IS did predict pre-treatment social interaction, it did not consistently predict social functioning following the intervention. As such, higher levels of IS do not appear to interfere with youth's ability to access and utilize the PEERS curriculum. Future work will examine the PEERS program with youth with confirmed diagnoses of internalizing disorders.

**424.258** The Feasibility of Non-Specialist Health Workers Delivering a Social Communication Intervention in New Delhi (India) Delivered in a Community Setting.

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Background:

Autism Spectrum Disorder (ASD), is a developmental disorder with a prevalence of 1 per cent in India. Hence there are over two million young children with autism requiring support, the majority of whom lack access to evidence-based care. The UK's Pre-school Autism Communication Therapy (PACT) has been shown to be effective and was adapted and expanded for use by non-specialists as the Parent Mediated Autism Social Communication Intervention for Non-Specialist Plus (PASS Plus). The PASS component, employs video feedback of naturalistic play to assist parents in creating a supporting social communication environment around their autistic child. The Plus component, supports other related concerns. The COMPASS (Communication-centered Parent-mediated treatment for autism spectrum disorder in South Asia) trial aimed to embed an effectiveness evaluation in New Delhi, India, by training health system frontline workers to deliver the intervention between December 2019-October 2023.

Objectives:

To evaluate the feasibility of non-specialist health workers delivering a social communication intervention for ASD in New Delhi (India) delivered in a community setting.

Methods:

A total of 261 children with ASD, aged 2 to 9 years, were randomized after recruitment from two government hospitals in New Delhi, India. Among them, 130 children were allocated to the intervention arm. The intervention was delivered by 7 Accredited Social Health Activists (ASHAs) and 10 project-based workers with similar characteristics which included a lack of exposure to childhood disability. The non-specialists received 7-day training followed by an internship period with practice cases. On achieving competency via a knowledge and skills assessment, these counsellors delivered cases within the trial. Families were offered 12 communication sessions, with Plus modules to address coexisting concerns based on felt need. All cases were tracked for a range of measures and counsellors received both individual and group supervision.

Results:

Descriptive analysis of the delivered sessions showed that 65% of families completed 12 sessions; 11% families received less than 3 sessions, 18% families received between 3 to 7 sessions, 7% families received between 8 to 11 sessions. The majority of sessions 77% were delivered in-person, followed by virtual delivery for 20% sessions, while 3% sessions were conducted in hybrid mode. Out of the total 1214 sessions, 7 health system frontline workers, the ASHAs delivered 39% sessions, while 10 project-based workers delivered 61% sessions. The average number of sessions being delivered by per ASHA being ~79 and the average number of sessions being delivered by project-based counsellors being ~74. 4 tranches of fidelity were conducted, with a total of 98 sessions being evaluated for treatment fidelity. 90% of sessions passed on the fidelity measure.

Conclusions:

The COMPASS trial adds to the evidence of the feasibility of task sharing a complex autism intervention to lay health workers in India. The intervention showed adaptability to various modes of delivery and the same this adaptation to the pandemic did not have any negative impact on its completion rate.

424.259 The Influence of Parental Stress on Outcomes of a Social Skills Intervention

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Background: Parental stress is a recognized risk factor for adverse child outcomes (Crum & Moreland, 2017), including the development of aggression and disruptive behavior (Theule et al. 2010), internalizing problems (Mäntymaa et al. 2011), compromised emotional coping (Cappa et al. 2011), and impaired social cognition and competence (Guajardo et al. 2009). Parental mental well-being is known to impact intervention outcomes for children with autism spectrum disorder (ASD), particularly in programs with a strong parent-implemented component (Shine & Perry, 2010; Kasari et al., 2015). Previous studies suggested that participating in a parent-assisted social skills program (Program for the Education and Enrichment of Relational Skills, PEERS®; Laugeson and Frankel 2010) reduced the parenting stress associated with adolescent mood and social isolation (Corona et al., 2019); however, the influence of parental stress on adolescents' intervention outcomes remains unexplored.

Objectives: Examining how parental stress influences adolescents' outcomes after participating in a 16-week, parent-assisted social skills intervention (PEERS).

Methods: Forty-five adolescents (5 females; mean age 14.23 years $\pm$ 1.87) and their parents/caregivers who completed the PEERS program were included. Adolescents completed pre- and post-intervention questionnaires to assess social, emotional, and behavioral challenges (Youth Self-Report, YSR). Parents/caregivers completed parallel measures to report their child's internalizing and externalizing problems (Child Behavioral Checklist, CBCL) and their stress level related to parenting (Stress Index for Parents of Adolescents, SIPA) across five domains (i.e., adolescent concerns, parent concerns, adolescent-parent relationship, total parenting stress, and life stressors) before and after the intervention. Linear regressions were used to examine if parental stress moderated intervention effects.

Results: Parents reported significant reductions in adolescents' somatic complaints ($F = 4.73$, $p = 0.02$), social problems ($F = 5.78$, $p = 0.018$), and aggressive behaviors ($F = 4.14$, $p = 0.045$) following the intervention (Table 1). Parental stress levels before the group intervention significantly moderated some treatment effects. Specifically, parents who endorsed greater stress related to their teens' moodiness/emotional lability ($\beta = -0.254$, $p = 0.026$) and delinquency/antisocial behaviors ($\beta = -0.284$, $p = 0.041$) observed less improvement in teens' somatic complaints. Additionally, caregivers who reported greater stress related to their life restrictions ($\beta = -0.264$, $p = 0.003$), social alienation ($\beta = -0.585$, $p = 0.004$), incompetence/guilt ($\beta = -0.388$, $p = 0.023$), and overall parenting stress ($\beta = -0.067$, $p = 0.003$) endorsed less improvement in teens' somatic complaints. Less stress on the relationship with their partner is associated with greater improvement in teens' somatic complaints ($\beta = -0.365$, $p = 0.012$) and aggressive behaviors ($\beta = -0.282$, $p = 0.007$). Interestingly, no significant relationship was found between parental stress and changes in social problems as measured by the CBCL (Table 2).

Conclusions: Parents within our sample reported significant improvements in their adolescents' somatic complaints, social problems, and aggressive behaviors following their participation in the PEERS program. Parent stress moderated changes in somatic complaints and aggressive behavior, but not social problems, suggesting stress may hinder treatment outcomes. Further research is needed to explore how parental stress interacts with social skills interventions to optimize outcomes for adolescents.

**424.260 The Psychological Impact of Leisure and Rehabilitation Activities in Children with Autism: A Delphi Approach**

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Background:

Emotional well-being and happiness have received little attention in the field of autism. When we focus on well-being, we often do so from a negative perspective, that is, the lack of functioning that is assumed to play a key role in ensuring a good quality of life. The leisure-rehabilitation programs offered to children and adolescents with autism convey different kind of psychological responses and have an intrinsic power to influence the emotional pattern in different ways.

Objectives: To define how different types of rehabilitation programs can be expected to influence the psychological response of children and adolescent affected by autism.

Methods:

We applied the Delphi procedure during a workshop with 18 expert therapists (12 females- 6 males), with at least 10 years' experience in pediatric neuropsychiatric rehabilitation, specifically in autism. A two-round Delphi study was conducted in accordance with the Guidance on Conducting and REporting DELphi Studies (CREDES) with the aim of achieving consensus regarding the appropriateness of 12 types of leisure-rehabilitation activities (Dance therapy, Dramatherapy, Exercising in the gym, Exercising in the swimming pool, Individual sports, Team sports, Indoor climbing, Music play, Outdoor visits to common life environments, Outdoor visits to museums, Outdoor visits to parks and gardens, Writing your life story) in inducing seven types of psychological responses: Emotional engagement, Social engagement, Cognitive engagement, Physical engagement, Just fun, Sense of adventure, Sense of novelty.

Each participant could vote from 0 (complete lack of appropriateness) to 10 (maximum of appropriateness), where 5 means doubtful. Kappa statistics tested interrater reliability.

Results:

We observed as expected an improvement of agreement with the second Delphi round (mean K from 0.36 to 0.39). The activities with the highest potential for each psychological response were indoor climbing for physical engagement, for sense of adventure and for sense of novelty; team sports for social engagement and for fun, dramatherapy for emotional engagement, writing your life story for cognitive engagement. The top five activities with the highest overall impact (mean overall score > 7) were in decreasing order: indoor climbing, team sports, outdoor visits to common life environments, exercising in the swimming pool, and dramatherapy.

Conclusions:

The analysis of judgement made through a Delphi method showed that the twelve leisure-rehabilitation activities may act in different way on seven types of psychological responses. This varied potential allows modulating in clinical practice the combination of activities to the specific needs of the subject in the best way maximizing the potential benefit of rehabilitation.

424.261 The Role of Gender in Social Goal Setting and Achievement for Autistic Youth in PEERS® for Adolescents

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Background: PEERS® for Adolescents, an evidence-based relational skills program, has been shown to reliably result in improvements in participants' social communication, engagement, and skills knowledge on standardized measures (Laugeson et al, 2009; Zheng et al., 2021). Further, preliminary research has shown that adolescents are more satisfied with their individualized goals following PEERS® (Fisher et al., 2024), reinforcing the social validity of the program in addressing the unique priorities of participants in line with the neurodiversity movement (Pellicano & den Houting, 2022), examining the role of gender in PEERS® program outcomes, research findings suggest that male and female adolescents benefit similarly on standardized measures (McVey et al, 2017). However, less is known about the role of gender in social goal identification and achievement. Research has demonstrated gender differences in social behavior, with autistic females generally showing stronger social communication skills and engaging in more camouflaging behaviors than autistic males (Wiskerke et al., 2018; Wood-Downie et al., 2021). Given this, it is possible that autistic female adolescents may identify different types of social goals or apply social skills differently, affecting social goal achievement in social skills programming.

Objectives: The current study aimed to examine gender differences in participant's social goal identification and achievement during an evidence-based social skills program, PEERS® for Adolescents.

Methods: Fifty-four adolescents ($M_{age}=14.2$, $SD=1.9$; 66.7% male; 51.9% White) identified 2–3 social goals during the first week of PEERS® (T1) and rated their satisfaction with each goal on a 7-point Likert scale from “very dissatisfied” to “very satisfied.” Goals were classified into six types: conversational skills, making friends, deepening friendships, conflict resolution, social confidence, and other. Participants later rated their satisfaction with their individualized goals 8-weeks into the program (T2) and during week 16, after completing the program (T3).

Results: There was no significant difference in the type of goals endorsed by males and females, $\chi^2(5)=4.96$, $p=.421$; however, quantitatively the most commonly endorsed type of goal for males was related to making friends (28%) while the most common goal type for females was deepening friendships (40.5%). Collapsing across gender, a repeated measures ANOVA revealed significant improvements in goal satisfaction over time for the full sample, $F(1.7,208.5)=190.52$, $p<.001$. Further, pairwise comparisons indicated significant improvement between each time point, $p<.001$. After including gender in the repeated measures ANOVA, there was a non-significant interaction between the effects of gender and time, $F(1.7)=0.33$, $p=.68$.

Conclusions: Overall, findings suggest that PEERS® for Adolescents participants were significantly more satisfied with their individualized goals after the program, further emphasizing the validity of PEERS® for autistic youth. When examining the role of gender, findings suggest that males and females report similar rates of improvements in satisfaction with their social goals over the course of PEERS® for Adolescents. This finding further supports previous literature that both male and female participants benefit from PEERS® (McVey et al, 2017). Given high co-occurrence of gender diversity and autism (Dewinter, De Graaf, & Beeger, 2017), future research should examine PEERS® program response among gender-diverse autistic adolescents.

424.262 The Social Tools and Rules for Schoolchildren (STARS) Program: A Pilot Investigation for Autistic Children

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Background: Developing friendships is critical for school-aged children, as peer relationships play an important role in one's personal well-being (Rose et al., 2022) and prevent social isolation and loneliness (Hartup, 1996). The Social Tools And Rules for Schoolchildren (STARS) Program is an adaptation of the existing teen-based START group program (Vernon et al. 2016) reimagined to increase social skills and connections for school-aged children on the autism spectrum. This program combines a 10-topic social curriculum with an immersive experiential learning emphasis encompassing unstructured peer socialization and play periods to provide a supportive, strength-based natural context for social experimentation and skill building.

Objectives: The aim of this study was to conduct a multiple baseline trial of the Social Tools And Rules for Schoolchildren (STARS) program in a clinic setting. Specifically, we assessed the preliminary efficacy, feasibility, and social validity of the STARS program through parent reported and behavioral observation measures of the children's social communication skills and enjoyment of the program to inform the likely success of a future effectiveness trial. It was hypothesized that child participants' social skill use would significantly increase and would report high social validity after participating in the program as demonstrated via behavioral data and parent reports. It was also hypothesized that the research team would find the STARS program feasible to run in the clinic setting.

Methods: Participants were three children with autism aged 7, 8, and 10 and their parents. Inclusion criteria included the use of full sentence phrases to communicate, a verbal IQ ≥ 70 , and verification of their autism diagnosis. Participants were diverse across genders (2 males, 1 female) and racial and ethnic identities (White and Hispanic/Latinx; Native American and Hispanic/Latinx; Asian and Non-Hispanic/Latinx). The bi-weekly STARS program consisted of an individual therapeutic check-in, group discussion and practice of 10 social skill topics, group activity, group socialization and play time, and an individual checkout. Pre intervention data was collected 2 weeks before the program began and post intervention data was collected 3 weeks after the program ended. Behavioral data on engagement, initiations, and responses were collected across multiple baseline timepoints, during every STARS session, and at post intervention. A social skill use measure (SSIS) was also collected at intake and post and social validity ratings were collected at post.

Results: Behavioral observation results indicate that social skill use improved for all three participants following participation in STARS (See figures 1, 2, and 3). For fidelity, adherence to the session protocol was 96.67% and the mean attendance was 93.33%. Overall, social validity ratings were moderately high for two participants. SSIS scores indicated generalization of social skill use increases for two participants (mean change = 5.67, SD = 3.4).

Conclusions: Results show promise for the STARS model in improving social communication skill use in autistic children. The model was found to be feasibly run within a clinic setting. These results warrant explorations into adapting the model for use in the schools and replications with larger cohorts of school-aged participants.



424.263 The Social Validity of TEACCH Practices in South Korean Educational Settings

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Background: Although TEACCH has been recognized for its effectiveness in improving learning outcomes for autistic individuals across cultures (Virues-Ortega et al., 2013), research and practical application in South Korea have been limited. Examining social validity by stakeholders who actually implement the intervention is crucial to determine that TEACCH is feasible, culturally appropriate, and effective for the target population; however, the social validity of TEACCH practices has not been closely examined either within South Korea or internationally.

Objectives: This study aimed to examine the social validity of applying TEACCH practices in South Korean educational settings, particularly for autistic school-aged children and preschoolers.

Methods: A total of 13 Korean stakeholders participated in this study (10 females, age range: 26-49 years), including five special education teachers, five therapists, and three parents, all working with or caring for autistic children aged 3 to 10. Participants' educational levels consisted of one high school graduate, one with an associate degree, six with bachelor's degrees, three with master's degrees, and two with doctoral degrees. All participants completed the TEACCH online workshop organized by the University of North Carolina at Chapel Hill. Semi-structured interviews were conducted both before and after the workshop: pre-workshop interviews inquired about participants' experiences with environmental structuring and TEACCH, while post-workshop interviews focused on opinions about the effectiveness of TEACCH for autistic children in South Korea. Data were analyzed using content analysis to identify key themes related to the social validity of TEACCH in South Korea.

Results: A total of three themes—current practices of structuring the environment, TEACCH-related experiences, and perspectives about TEACCH—were identified from the pre-workshop interviews, while one theme, perspectives on the use of TEACCH in Korea, was identified in the post-workshop interviews. Tables 1 and 2 present the sub-themes, categories, and exemplary quotes identified in the pre- and post-workshop interviews, respectively. The pre-workshop interviews revealed that most participants structured the environment for autistic individuals predominantly using visual methods. For those not structuring the environment, reasons included environmental constraints (e.g., limited space) or individual characteristics that made it unnecessary. Many participants had some experience learning about TEACCH. All participants who had experience with TEACCH found it helpful, but concerns were raised regarding its effectiveness depending on the individual characteristics of autistic children. The post-workshop interviews revealed mixed perspectives on TEACCH. Participants who viewed TEACCH as effective reported that it was well-suited to the characteristics of autistic individuals and facilitated skill acquisition. Others saw TEACCH as only partially effective, considering the complexity of tasks and diverse environments. Concerns related to practical challenges, such as limited space and time for implementation were mentioned.

Conclusions: The social validity of TEACCH for school-aged and preschool-aged autistic children in South Korea revealed mixed results, with some expressing positive views while others had concerns. We plan to follow up after a month to explore the long-term social validity of the program. Future studies are needed to develop specific strategies for implementing TEACCH in the Korean educational system, taking into account cultural differences and variations in educational structures.



424.264 Therapist-Driven Adaptations to an Individualized Mental Health Intervention for Autism (AIM HI) Delivered Via Telehealth

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Background: Research supports the use of telehealth for supporting autistic individuals (Ellison et al., 2021). Further, adaptations to evidence-based interventions (EBI)—when delivered in community settings—are common (Lau et al., 2017; Stirman et al., 2013) and may serve to increase EBI feasibility or fit to novel modalities. Characterization of adaptations for telehealth can increase access to high quality interventions. An Individualized Mental Health Intervention (AIM HI) is an EBI for school-age autistic children with co-occurring mental health needs (Brookman-Frazee et al., 2022), but research has not evaluated AIM HI delivered via telehealth.

Objectives: This study aims to (1) characterize therapist-driven adaptations to AIM HI when delivered via telehealth, and (2) evaluate the perceived feasibility of AIM HI by providers who learned AIM HI in a telehealth modality.

Methods: This study analyzes data from a Hybrid Type 3 implementation-effectiveness trial testing implementation strategies paired with autism EBIs in youth mental health settings to characterize therapist-driven adaptations to AIM HI via telehealth. The sample consisted of mental health therapists enrolled in the trial who completed at least 80% of the 6 month AIM HI training process ($n = 20$) and delivered AIM HI via telehealth. Most were female (80.0%) and had a Master's degree (75.0%). Providers received AIM HI training, including introductory workshops, ongoing coaching/consultation, and case-specific feedback by expert trainers. Post (6 month) training data are reported, including therapist report of adaptations and perceived intervention feasibility.

Results: Most participants (50.0%) delivered AIM HI via computer, laptop, or tablet, or in combination with phone (25.0%). Most (52.6%) reported adapting AIM HI for their client/family to a great or very great extent. Mean ratings were in the moderate range for integration of components from other treatments ($M (SD) = 2.93 (1.16)$; scale = 1-5), lengthening/extending pacing ($M (SD) = 2.85 (1.22)$), adjustment to how components were presented/discussed ($M (SD) = 2.71 (1.21)$), and modification to intervention materials ($M (SD) = 2.25 (1.25)$). Providers also reported applying AIM HI strategies to novel populations ($M (SD) = 2.53 (1.34)$). Infrequently reported adaptations were shortening pacing or skipping/adjusting component order. Providers delivering AIM HI via telehealth reported it was feasible ($M (SD) = 4.09 (.77)$; scale = 1-5).

Conclusions: This study highlights prevalent adaptations during telehealth delivery of AIM HI. The percent of providers reporting adaptations were similar to those reported in research examining adaptations for in-person delivery (Dyson et al., 2019). Reported adaptations were largely fidelity-consistent, representing consistency with the AIM HI protocol and aligned to strategies for individualizing the intervention to specific clients.

These findings may also indicate modifications particularly relevant to the telehealth format (e.g., modifying materials for computer/tablet), which may be relevant to other autism or mental health interventions being modified for telehealth. Finally, the findings suggest that delivery of AIM HI via telehealth is feasible, which can increase access to evidence-based approaches for autistic youth with co-occurring mental health needs. Future research should evaluate the effect of these adaptations on intervention fidelity and youth mental health outcomes.

424.265 Therapist-Reported Adaptations to an Individualized Mental Health Intervention for Autism (AIM HI) Delivered in School-Based Settings

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Background: Community therapists' adaptations to evidence-based interventions (EBI) are common and may serve to improve feasibility and fit of EBIs to different service delivery contexts (Lau et al., 2017; Stirman et al., 2013). Many EBIs for autistic youth with co-occurring mental health needs were developed for and tested within clinic-based settings. However, youth often receive mental health services with schools, and limited research has evaluated how EBIs are adapted to fit this context (Sturm & Kasari, 2023). An Individualized Mental Health Intervention (AIM HI; Brookman-Frazee et al., 2010) is a parent-mediated and child-focused intervention to reduce challenging behaviors for school-age children with autism and co-occurring mental health needs in publicly-funded mental health services. Evidence supports its effectiveness in clinic- and school-based services (Brookman-Frazee et al., 2022). This study leverages data from a Hybrid Type 3 implementation trial testing implementation strategies paired with autism EBIs in children's mental health settings to characterize therapist-reported adaptations to AIM HI within school-based mental health services.

Objectives: This study aims to (1) characterize therapist-reported adaptations to AIM HI by school-based mental health providers, and (2) evaluate the feasibility and intentions to use AIM HI within school-based services.

Methods: The sample consisted of school-based mental health therapists enrolled in the AIM HI TEAMS trial who completed at least 80.0% of AIM HI training ($n = 25$). The majority of the sample was female (64.0%) and had a Master's degree (88.0%). Primary disciplines included Marriage and Family Therapy, Social Work, School Psychology, and Mental Health Counseling. All providers received 6 months of training in AIM HI, including didactic workshops and ongoing coaching/consultation for approximately 6 months with case-specific feedback and performance monitoring via video and material review by expert coaches/trainers. Data are reported from the post (6 month)-training questionnaire, which included therapist-reported adaptations when delivering AIM HI, and feasibility and intentions to continue using the intervention.

Results: Overall, 50.0% of school-based providers reported adapting AIM HI for their client/family to a great or very great extent. The most frequently reported adaptations were lengthening/extending pacing (33.4%), integrating components from other treatments (29.1%), and applying AIM HI strategies to novel populations (25.0%). Also common was the involvement of other people in the child's care (e.g., teachers). Providers reported minimal adaptations to the order of the AIM HI protocol steps, and they rarely reported shortening or skipping components. Providers reported high levels of feasibility and intentions to continue delivering AIM HI.

Conclusions: Therapists reported a variety of fidelity-consistent adaptations when delivering AIM HI in school settings. They also found AIM HI feasible and fitting for the school-based context. Adjusting pacing to fit services delivered within the school day may be particularly relevant to school-based delivery, especially when involving caregivers in care. Tools for supporting school-based providers in involving other people in the youth's care, and for integrating other approaches, may also be important. In addition to examining the impact on youth outcomes and intervention fidelity, next steps include comparing adaptations for school- and non-school-based mental health providers.

424.266 Understanding Homework Practice of Skills Taught during a Cognitive-Behavioral and Mindfulness Based Program

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Background: Few social functioning programs exist for adults. TUNE In (Training to Understand and Navigate Emotions and Interactions), a 17-week cognitive behavioral and mindfulness program, was developed at the University of Pennsylvania to support social functioning in autistic adults by addressing social anxiety (component 1), social skills and cognition (component 2), and skill generalization (component 3).

Objectives: The goal of the present study was to assess participant completion of assigned homework throughout the program, what influenced homework completion, and how homework completion was associated with changes in social functioning scores.

Methods: Overall, 20 participants completed TUNE In as part of a larger randomized control trial. Participants completed the Social Responsiveness Scale (SRS-2) self-report, as a measure of social functioning, prior to starting TUNE In and after each of the 3 components. In addition, participants reported preferences (ie., how helpful and useful different skills were) on various elements within each component via a qualitative interview. Participants' homework completion, practicing five different mindfulness-based exercises (Warm-Up Stretches, Mindful-Walking, Sitting, Standing, and Listening Exercises) taught during component 1, was tracked during component 2 via weekly logs where participants indicated how often they practiced each exercise daily.

Results: Overall, participant SRS-SR scores significantly improved after the first component of the TUNE In ($t(16) = 2.57, p = .02$), while responses to the subsequent two components, component 2 ($p = .11$) and component 3 ($p = .42$), varied. There was a significant correlation between how helpful participants found the exercise and the amount of homework practice for only one of the five mindfulness exercises (walking exercise; $r = .73, p < .01$). Post-Component 1 SRS scores were inversely correlated with Amount of Homework Practice across all exercises (controlling for baseline SRS; all $r = -.66, p = .01$). This suggests that those who showed greater response to component 1 of TUNE In on the SRS-SR, subsequently practiced these exercises (at home) more going forward. Exploratory analyses revealed that prior experience in a group-format organization (e.g., sporting, social, or artistic) significantly predicted the amount of homework practice among participants overall ($t(15) = 2.31, p = .04$) and the amount of practice of 3/5 exercises specifically (Walking, Listening, and Standing; all $t(12) > 2.79, p < .02$). The mean amount of exercises practiced after component 1 was three times greater among those with experience in group-format organizations before (average total exercises practiced: 75.80 vs 26.17).

Conclusions:

Overall, mindfulness exercises were particularly effective elements within TUNE In, a multifaceted program to support autistic adults socially. While their qualitative reporting on how helpful certain exercises were did not correspond to how much they practiced these exercises in the future, how helpful these exercises were quantitatively (ie., as captured by the SRS-2) did relate to how often participants practiced these exercises in the future. Moreover, having prior experience with group-activity formats was associated with how much participants practiced these exercises, suggesting that prior experience in group activities may be a meaningful variable in response to support programs.

424.267 Using Linguistic Analysis to Measure Clinical Intervention Outcomes Among Autistic Youth

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Background: Autism is characterized by challenges in social communication as well as repetitive and restricted patterns of behavior. Given autism's heterogeneous nature, an efficient way to characterize individual participants is needed to tailor intervention efforts. There is a growing number of evidence-based interventions designed to target social skills in autistic individuals, bringing along a critical need for methods to granularly and objectively measure clinical outcomes. Previous studies have examined linguistic differences in autism (Parish-Morris et al., 2016) and the potential to use them as part of an assessment tool for clinical outcomes and a digital phenotyping toolkit. The START Program is an intervention for transition-age youth, designed to target social communication by providing an opportunity to practice conversational skills. An RCT of this intervention was previously conducted and validated, imparting a sample well-suited for linguistic analysis.

Objectives: To assess whether key clinical outcomes can be measured using computational linguistic analysis, validated by gold-standard human annotation.

Methods: Adolescents aged 12-17 years with a confirmed diagnosis of autism were recruited to participate in the START RCT, and randomly assigned to "START" or "waitlist" groups. START participants (N=35 teens, 11 female) completed two five-minute "get to know you" conversations with unfamiliar neurotypical confederates, one male and one female per session. These conversations were recorded at intake and at weeks 5, 10, 15, 20 (post-intervention) and 40 (follow-up). Waitlist participants also completed conversations at intake and 20 weeks, then enrolled in the START program. Conversations were systematically coded by trained raters to identify verbal and nonverbal behaviors related to social inquiries, minimal encouragers, eye contact, and positive facial expressions. Prior analysis of outcome measures and behavioral coding revealed significant interactions between group and time, indicating positive treatment effects in the START group (Vernon, 2018). Linguistic analyses are complete for 16 conversations from 8 participants (4 START, 4 waitlist, half female) at intake and 20-weeks. Audio was manually transcribed by trained annotators. Conversational features were analyzed using an in-house Python script to identify features such as turn-taking rates (Cho et al., 2023). Language features (word valence, frequency, etc.) were extracted using LIWC software (Boyd, 2017). Acoustic features of participants' voices were analyzed using Covarep (Degottex, 2014) and openSmile (Eyben, 2010).

Results: Compared to pre-trial conversations, START participants produced significantly more second-person pronouns ("you": $p < 0.001$) and friend-related words ($p = 0.007$). These changes differed significantly from waitlist participants ("you": $p = 0.05$, friend: $p = 0.03$). START participants' voices also became more stable (lower SD of amplitude: $p = 0.01$, lower average zero crossing rate: $p = 0.001$) compared to both post-intervention and compared to waitlist participants (SD amplitude: $p = 0.025$, zero crossing rate: $p = 0.07$).

Conclusions: Social skills intervention outcomes can be captured using linguistic and speech features extracted from automated analysis pipelines. Final analyses will include 421 conversations at all study time points. Examining outcomes across the intervention duration could aid in identifying areas of strength and weaknesses for each individual, and inform future smart-design clinical trials that actively re-assign participants based on key treatment response metrics.



424.268 Viewpoints on Barriers and Facilitators to Physical Activity Among Autistic Adults

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Background: Insufficient physical activity (PA) among autistic adults is a growing concern due to its association with increased risks of obesity, diabetes, and cardiovascular diseases. However, information about the barriers and facilitators to PA participation among this population is limited.

Objectives: This study aimed to investigate the viewpoints on factors influencing PA from the perspectives of autistic adults.

Methods: Q-methodology, a research method that studies people's subjective opinions by having them rank-order statements, revealing patterns through statistical analysis, was used to examine the viewpoints of autistic adults, their parents, and health professionals on PA among autistic adults. Forty-one statements on PA's barriers and facilitators were developed based on previous studies and input from autistic community advisors. Forty-one participants, including 29 autistic adults (M age = 32.0 SD = 6.8), eight mothers of autistic individuals (M age = 39.3, SD = 4.8) and four health professionals (M age = 31.5, SD = 6.76), sorted each statement onto a normally distributed sorting grid on a continuum of "least like how you think" (ranking value: -6) to "most like how you think" (ranking value: +6). Sorts from participants underwent varimax-by-person centroid factor analysis to identify the viewpoints. This statistical method clusters similar ranking patterns based on correlations, revealing distinct groups of shared perspectives or viewpoints among participants.

Results: Four viewpoints were identified: 1. Difficulty maintaining PA due to inherent autistic traits despite available resources; 2. A lack of social support and negative PA perception; 3. Social, behavioural control and financial barriers; and 4. A need for tailored PA programs.

Conclusions: The results suggest that autistic adults experience the common barriers to participating in PA observed in the neurotypical population. However, autistic adults also face unique barriers to participating in PA related to their neurodivergence (e.g., hypersensitivity and social differences, motor coordination). A lack of understanding and support for their unique needs contributes to negative PA experiences and perceptions, which could reduce their motivation for PA. However, autistic adults expressed interest in tailored PA programs and social support. Future intervention design should consider creating appropriate PA settings, providing social support, and personalised strategies to improve autistic adults' PA experiences and participation.

424.270 "Finding Some Sisters": An Initial Evaluation of an Autistic-Led Peer Support Program for Newly Diagnosed Autistic Women

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Background: Autistic women are frequently underrecognized early in life and go on to receive their autism diagnoses in adulthood, which often carries negative mental health repercussions. Despite a high need for mental health services, a lack of post diagnostic support is consistently noted as a source of distress for late diagnosed Autistic women. There is growing recognition of the benefits of peer support amongst Autistic youth and adults. However, there is a lack of evidence for peer support programs tailored to the needs of newly diagnosed Autistic women.

Objectives: This study aimed to: 1) evaluate the feasibility and acceptability of an Autistic-led virtual peer support program for newly diagnosed Autistic women; 2) assess limited efficacy through changes in participants' mental health, social connectedness, and Autistic identity; and 3) explore participants' experiences in the program.

Methods: Recognizing insights from Autistic women are essential in designing effectively tailored supports, this study used participatory methods throughout program development and evaluation. Inclusion criteria for program participants included: 1) receiving a clinical autism diagnosis in the 8 months prior to start of the study; 2) identify as a woman; 3) English proficiency; 4) 18 years of age or older; 5) able to participate independently in the virtual program. The 8-session program included psychoeducation on various aspects of autism, neurodiversity, and sex/gender-based concerns identified during the coproduction process. Each session also allowed for the sharing of participants' perspectives and experiences. Feasibility was assessed by session attendance and completion rates (i.e., attended 75% of sessions). Acceptability was assessed through a post-program satisfaction questionnaire. Limited efficacy testing was assessed via pre- and post-program surveys measuring wellbeing, Autistic identity, and social connectedness. Participants also completed post-program semi-structured interviews. Data analysis is ongoing. Pre- and post-changes will be analyzed using descriptive statistics and paired-sample t-tests. Qualitative analysis is guided by an inductive reflexive thematic analysis through processes of familiarization, coding, and theme development. Analytic summaries are currently being refined with a team of self-advocates, researchers, and trainees.

Results: A total of 18 Autistic women participated in the program ($n=15$ completed pre and post questionnaires; $n=17$ completed individual interviews). Participants' attendance was strong ($M_{\text{sessions}} = 7.0$, $SD = 1.23$) with an 88.8% completion rate, demonstrating initial feasibility. Participants were satisfied with the program (100% agree/strongly agree that they would recommend the program to other Autistic women), including the virtual format (87.5% agree/strongly agree the online sessions were convenient and easier to attend than in-person sessions), indicating high levels of acceptability. Qualitatively, participants identified a number of positive outcomes such as new skill development, enhanced wellbeing, and increased sense of community. Participants highlighted that peer-support programming created unique opportunities to develop positive Autistic identities by connecting, learning, and sharing in a safe, Autistic-led environment.

Conclusions: Results to date provide preliminary support for the feasibility, acceptability, and limited efficacy of a novel Autistic-led virtual peer support program for newly diagnosed Autistic women. Findings can inform future programming to meet the underserved needs of newly diagnosed Autistic women.

424.272 An Assessment of the Potential for Adoption of XR Technologies to Improve Academic Outcomes for Autism Spectrum Disorder Learners.

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Background: The 4th industrial revolution is changing the way we live and work in fundamental ways. New breakthrough technologies are creating new forms of revenue and value that enable and improve our daily lives Schwab (2016).

The acceleration of these new technologies is creating mounting pressure on the workforce of the future, and there is much discussion on the latent readiness of the educational sector Kosko et al. (2021) and Education 4.0 policies and strategies to generate the relevant skills and talent necessary for the future Collins et al. (2023).

In South Africa the Autism Spectrum Disorder community remains disenfranchised from the talent pool due to a lack of relevant academic opportunities Pillay et al. (2022), facing choices of mainstream schooling with a focus on academic standards but a challenging learning context, or, special schooling environments which cater more readily to their environmental needs, however these focus on life and coping skills rather than academic growth Keen et al. (2016).

Objectives: Research question: To what extent are XR technologies being considered by educators to improve the learning experience and outcomes for autistic children?

We focus on *virtual reality*, *augmented reality*, and *mixed reality* with the following objectives:

1. To understand levels of awareness of XR technologies within South African educators (of ASD learners).
2. To assess their (SA Educators of ASD learners) understanding of the potential of XR technologies to impact the learning experience and learning outcomes of ASD students.
3. To assess whether they would consider adopting extended realities technologies within their teaching practices.
4. To make recommendations to educators and the technology industry to enable the adoption of XR technologies for educational purposes.

Methods: Thirteen qualitative semi structured interviews were conducted within a six week period using non-probability sampling. We explored current levels of awareness and usage of extended realities (XR) technologies and we utilised the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) model Venkatesh et al. (2012) to understand the factors that influence the consideration and adoption of extended realities technologies by special needs educators in the Western Cape, South Africa, for application to the ASD learning context.

Results: Current levels of awareness and usage of XR technologies was low, with little exposure in social media, the most prolifically used source of continuous learning for the participants. However, once exposed to the technologies in the form of presentation and discussion, 85% of the participants in the study believed that XR technologies could positively impact the ASD learning experience and were willing to embrace the technology where relevant (dependent on the learner) and with a balanced approach to use with due consideration for the risk of over reliance on the technology.

Conclusions: Given the openness of the participants and their collaborative partnerships with the parents of ASD children to explore new possibilities for ASD intervention, the opportunity exists for further research. We propose an experimental longitudinal study to test the use of XR technologies for positive impact on the ASD learning experience and academic outcomes.

424.273 A Randomized Control Trial on the Effectiveness of Improvisational Music Therapy for Autistic Children. Baseline Findings.

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Background:

Improvisational music therapy is a promising intervention for autistic children who often encounter difficulties in social communication and high levels of anxiety. Previous studies on music therapy for autism have shown mixed results partly due to limitations in outcome measures. This trial aims to use more sensitive tool that measures change in social communication and a broader range of assessments to capture post-intervention changes more effectively. The study is ongoing, and we have currently randomized 123 autistic children. We will have baseline data on all 200 children by April 2025, and will present the baseline findings at INSAR.

Objectives:

The primary aim of this trial is to examine whether improvisational music therapy can improve social communication in autistic children aged 7-11 years. Secondary objectives include assessing the impact of music therapy on adaptive behaviour, anxiety, and well-being. Additionally, subgroup analyses based on verbal ability (minimally verbal, phrase-speaking, and fluent speakers) will be conducted.

Methods:

This randomized controlled trial (RCT) involves 200 autistic children from various UK schools who will be recruited between November 2023 and April 2025. Participants are randomly assigned to receive either 12 weeks of improvisational music therapy or support as usual. The trial followed an assessor-blind, pragmatic two-arm cluster design. Baseline data are collected before randomization, and follow-up assessments will be conducted at 13 weeks (T1) and 39 weeks (T2). Music therapy is administered twice weekly (30 minutes per session) by a registered and specialised music therapist. Various improvisational techniques are employed to engage a child and in turn enhance social communication skills. The primary outcome is the change in social communication, measured by the Brief Observation of Social Communication Change (BOSCC). The secondary outcome measures include: (1) Parent reported anxiety scale for youth with ASD (PRAS-ASD) (2) Young Child Outcome Rating Scale, for wellbeing (YCORS), (3) Strengths and Difficulties Questionnaire (SDQ); and (4) Vineland Adaptive Behaviour Scale (VABS). (5) The Children's Communication Checklist-2 (CCC-2) is completed to evaluate pragmatic speech with fluent speakers only. (6) The Music Engagement Scale (MES); and (7) Assessment of the Quality of Relationship (AQR) are used to evaluate the child-therapist relationships using video-analysis of music therapy sessions. Demographic information is collected using the Wechsler Abbreviated Scale of Intelligence (WASI-II), Music at Home Questionnaire (M@H), Children's versions of the Empathy Quotient (EQ) and Systemizing Quotient (SQ). This randomized control trial is registered with the NIH U.S. National Library of Medicine: <https://classic.clinicaltrials.gov/ct2/show/NCT06016621>, clinicalTrials.gov Identifier: NCT06016621.

Results:

By April 2025, we will have randomized the full sample of 200 autistic children. Linear and multiple regression analysis will be conducted to show inter and intra variability between the two groups and the three study arms. Verbal ability may be used as potential predictor for levels of social communication as well as the secondary outcomes

Conclusions:

Baseline findings will allow us to explore potential predictors and mediators of social communication outcomes, laying the foundation for assessing the effectiveness of music therapy.

424.274 Feasibility and Preliminary Efficacy of Community Autism Peer Support (CAPS) Program Targeting Community Functioning in Young Autistic Adults

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Background: There is a lack of peer support interventions delivered by autistic individuals themselves, and little research has been conducted to examine these emerging services from the perspective of those with lived experience. Recognizing the national and urgent need for service development and delivery for autistic adults, a steering committee – including autistic adults, family members, peer specialists, researchers, service providers, and policymakers - developed the Community Autism Peer Support (CAPS) program. Based on existing peer support models, the CAPS program includes features such as goal-oriented activities and individualized support plans that allow peer specialists to tailor the program to each person's needs and interests.

Objectives: To investigate the feasibility and preliminary efficacy of the CAPS program – a peer support service designed for autistic individuals, targeting community functioning in young autistic adults.

Methods: Participants were autistic adults aged 18 to 30 with a formal autism diagnosis and challenges in one or more major life areas (social, school, work, self-maintenance). They were randomly assigned to either receive CAPS services delivered by trained peer specialists for up to 12 months or to continue with their usual services. Intervention participants met regularly with peer specialists to discuss goals, challenges, resources, progress, and action steps. All results were assessed at the 3-month follow-up. Feasibility and acceptability were assessed using semi-structured qualitative interviews. Fidelity was assessed using service data, progress notes, and qualitative interviews. Relationships between the peer specialists and participants were assessed by the Working Alliance Inventory (WAI) and IPS Core Competencies Scale (IPSCCS).

Results: Of 102 autistic adults assessed for eligibility between Mar 2023 and Aug 2024, 40 were randomized to the CAPS intervention (n=20) or control (n=20) groups (Table 1). Qualitative data at 3-month from a total of 16 intervention participants regarding their perceptions and responses to the intervention supported feasibility and provided important insights to guide future trials (Table 2). WAI (M=3.15, SD=0.49) and IPSCCS scores (M=3.96, SD=0.67) indicated high levels of agreement and positive relationships between participants and peer specialists. For fidelity, more than half the participants received full points on at least seven out of 10 service delivery criteria that are viewed as essential components of the CAPS program. Preliminary efficacy data will be presented in detail for INSAR. Methodological challenges to designing and implementing a randomized controlled, clinical trial with a new service in partnership with providers in the community settings included (1) difficulty recruiting/hiring trained peer specialists at the beginning of the trial, (2) lack of experiences in delivering peer support services or work experiences in general among peer specialists, and (3) staff/supervisor turnover and engagement.

Conclusions: CAPS is one of the first autistic-delivered peer support interventions for autistic young adults. There is evidence showing that the CAPS program is a feasible and acceptable service for autistic young adults in the community setting. However, evidence supporting the preliminary efficacy of this model is limited. We will discuss challenges and potential solutions to conducting an RCT in the community setting based on our experiences.

Poster Session

425 - Social Cognition and Social Behavior I

May 2nd, 2025, 12:30 PM - 1:30 PM - Hall 4A

425.275 Verbal Comprehension and Applied Theory of Mind Competence Mediate the Prediction of Explicit Theory of Mind Knowledge on Social Functioning in Children with Autism Spectrum Disorder: A Two-Year Follow-up Study

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Background:

Children with autism spectrum disorder (ASD) face significant challenges in social functioning, which are influenced by theory of mind (ToM) and verbal comprehension. ToM can be categorized into explicit knowledge and applied competence. While most research has focused on explicit ToM knowledge, the crucial impact of verbal comprehension on social functioning is often underestimated. Additionally, the reliance on cross-sectional designs may limit our understanding of how these dynamics evolve over time. Addressing these gaps can deepen our understanding of the mechanisms underlying social functioning in children with ASD and facilitate the development of more effective, targeted interventions.

Objectives:

This study aimed to investigate whether applied ToM competence and verbal comprehension mediate the prediction of explicit ToM knowledge on social functioning over a two-year period in preschool to school-aged children with ASD.

Methods:

A total of 123 children diagnosed with ASD (106 boys) participated in this study, completing an initial assessment (T1: January 2015 - October 2018) and a follow-up (T2: May 2017 - November 2020), approximately two years apart. At T2, the children were aged 5 to 14 years (mean = 8.6, SD = 1.7). Consistent procedures were followed at both assessments. Standardized tasks and questionnaires were applied to assess children's social functioning, verbal comprehension, explicit ToM knowledge, and applied ToM competence. A mediation analysis model (Figure 1) was used to determine if explicit ToM knowledge could predict social functioning and to explore how this predictive relationship is influenced by applied ToM competence and verbal comprehension.

Results:

The mean scores for the 123 children with ASD showed no significant differences between T1 and T2, except for ToMTB ($t_{(122)} = 3.1, p < .05$) and ToMI-2-C ($t_{(122)} = 6.9, p < .05$). The mediation analysis (Figure 1) revealed that scores on explicit ToM knowledge significantly predicted social functioning scores (total effect, effect size = 0.48; 95% CI: 1.38 to 3.00), with applied ToM competence and the verbal comprehension serving as key mediators (the serial indirect effect, pathway $a1 \times a3 \times b2$, effect size = 0.14; 95% CI, 0.03 to 0.24). Additionally, explicit ToM knowledge also predicted applied ToM competence over a 2-year period (parallel indirect effects, pathways $a2 \times b2$, effect size = 0.14; 95% CI = 0.01 to 0.31).

Conclusions:

This two-year study investigates how ToM influences social functioning in children with ASD. The findings show that applied ToM competence and verbal comprehension act as key mediators linking explicit ToM knowledge to social functioning. Furthermore, explicit ToM knowledge is foundational, as it predicts applied ToM competence and social functioning. Therefore, interventions should prioritize enhancing explicit ToM knowledge before adapting them to the child's verbal comprehension abilities to improve social outcomes.



425.276 The Interplay of Sociability, Social Cues Processing and Theory of Mind: Insights from Williams Syndrome

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Background: Williams syndrome (WS) is often considered to be the opposite of autism because of the distinctive phenotypic features of high sociability and increased visual attention to faces. Yet, compared to neurotypical peers, individuals with WS experience difficulties maintaining social relationships and interpreting social situations. They are also less successful on theory of mind tasks.

Objectives: This study used behavioral and neural measures in young adults with WS to examine their ability to effectively integrate and interpret multiple social cues. We hypothesized that basic perceptual abilities would be intact, while higher-order cognitive processes needed for accurate interpretation of social information would be less efficient compared to the neurotypical peers.

Methods: 27 adults with WS ($M = 28.36 \pm 7.43$ years) and 30 neurotypical controls ($M = 25.52 \pm 7.35$ years) completed a novel visual two-alternative forced-choice "Mind Reading" task that involved identifying a preferred object based on a combination of co-occurring facial cues (positive vs. negative emotional expressions; gaze direction toward vs. away from the target item) displayed by unfamiliar young adult faces. Event-related potentials (ERP) in response to faces and objects characterized neural processes supporting task performance. Temporal principal components analysis identified time windows corresponding to the perceptual (N170), attentional (P3), and affective (LPP) processing of social (faces) and nonsocial (objects) stimuli.

Results: Although objectively less accurate than the neurotypical peers, participants with WS successfully identified preferred vs. not preferred objects (M accuracy > 70%) when corresponding positive and negative facial emotional expressions were paired with the gaze directed toward the target item. However, they performed at chance level when the correct response required disengaging from the direction of the gaze, with greater decrement in performance observed for participants with lower IQ. ERPs revealed no group differences in the neural responses indexing face perception and no evidence of increased salience of social stimuli in WS. Contrary to the findings in the neurotypical peers, ERP responses to target objects in participants with WS were not significantly modulated by gaze direction, less sensitive to the facial emotion context, and reflected no extended processing beyond the initial affective evaluation. Biological sex differences did not affect the results.

Conclusions: The pattern of similarities and differences between the WS and neurotypical groups indicates that successful utilization of social information requires the ability not only to perceive but to integrate multiple facial cues (e.g., emotional expression and gaze direction) and to engage higher-order cognitive abilities needed to accurately interpret indirect social signs (e.g., averted gaze). The current findings support the idea that increased social interest may not be sufficient for optimal social-pragmatic functioning and therefore have implications for the design of interventions targeting social competence in neurodevelopmental disorders.

425.277 Adaptive Profile Changes from Toddler to School Age in Children with Low & Moderately Low Adaptive Skills in Autism Spectrum Disorder (ASD) and Its Implications for Functional Goal Making

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Background: In ASD, the core deficits of social communication delay and restricted/repetitive behaviour patterns can impair adaptive functioning, i.e., Skills the child needs to function in day-to-day life. As adaptive demands increase with age, understanding how adaptive skills evolve helps in modifying interventions and adjusting social environments.

Objectives: This study examines adaptive level trajectories in different domains & sub-domains from toddlerhood to school age, in children with low and moderately low adaptive skills and their implications for functional goal-setting.

Methods: The study included 483 children aged 2–12 years, with mild-to-moderate CARS-2-ST scores, from urban, middle-to-upper socio-economic backgrounds, with at least one parent holding a graduate-level education. Adaptive skills were assessed using the Vineland-3 scale. Non-parametric tests were used for statistical analysis.

Results: 65% of the children had low and 35% moderately low adaptive levels with 81.3% male and 18.7% females. Gender was not significantly associated with the results.

Overall adaptive level standard score (SS) was negatively correlated with age ($p < 0.001$), with 1.28 unit decrease in SS for 1 unit increase in age. For communication and motor domains, the correlation between age and adaptive level changes was not significant. In ADL (activities of daily living) and socialization domain, there was a negative correlation ($p < 0.001$) with 1.90 unit decrease in ADL and 1.88 decrease in social skills for each unit increase in age.

In sub-domains, for receptive language, gross and fine motor skills the association between age and domains was not significant. There was a negative correlation, for expressive and written language with a decrease of 0.11 (expressive) and 0.12 (written) units with 1 unit increase in age. Personal & community ADL skills also decreased with age (0.09- personal, 0.37- community). All three sub-domains of the socialization domain (interpersonal, play, coping) were negatively correlated with age (0.31/0.66/0.33 unit decrease for each unit age increase).

Low Adaptive Group: Overall, communication, receptive language, and gross motor skills improved across age. ADL and socialization domain, expressive language, personal and community ADL skills, interpersonal, play/leisure, and coping skills declined with age. Motor and fine motor domain variations were not significant.

Moderately Low Group: Overall, communication and fine motor skills improved, and the adaptive level of play/leisure skills decreased over age. All other domains and sub-domain changes were not significant. Written language peaked in the 3.1–6 years for both low and moderately low groups.

Conclusions: Overall, communication and motor adaptive levels were stable from toddler to school age, while ADL and socialization skills decreased. Moderately low adaptive levels showed improvement or stable trajectories for all domains, except the play/leisure domain. Low adaptive level showed improvement in communication, receptive and motor domain, but decline in all parameters of socialization domain, ADL skills, and expressive language. The impact of environmental factors and cognitive abilities on adaptive skills needs to be evaluated. The distinct adaptive level changes, emphasize the need for customized interventions and changes in social environments, including schools, to promote better functional independence in children with ASD.



425.278 Impact of Diagnostic Disclosure and Stigma on First Impressions Formed By Autistic and Non-Autistic Adults

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Background: Literature suggests that diagnostic disclosure improves how autistic individuals are perceived by non-autistic raters (Sasson & Morrison, 2017), but the impact of diagnostic disclosure may be mitigated by the amount of autism stigma raters hold (Morrison et al., 2019). Research in other marginalized groups suggests that internalized stigma negatively influences within-group social perceptions (Misra et al., 2021), but there have been no investigations into how internalized stigma of autistic raters influences first impression formation of autistic and non-autistic individuals.

Objectives: Analyze the autism stigma of autistic and non-autistic raters and investigate how stigma and diagnostic disclosure influence first impressions formed of autistic vs non-autistic adolescents.

Methods: We gathered 48 video clips of autistic and non-autistic adolescents aged between 12 and 17 mimicking sentences originally produced by non-autistic adolescents. Half the videos were accurately labeled with the adolescent's neurotype, i.e. "this individual has an Autism diagnosis" or "this individual has no diagnosis", the other half were unlabeled. Autistic ($N=120$) and non-autistic ($N=141$) adult raters watched each video and used slider bars to provide their first impressions by indicating agreement with seven statements (e.g. "How likely is it that this person is likable") (Sasson et al., 2017). After watching all videos, raters also completed a scale measuring autism stigma (Gillespie-Lynch et al., 2015) and another scale measuring impression management, i.e. participants' motivation to inhibit prejudiced reactions (Dunton and Fazio, 1997).

Results: A two (rater neurotype) by two (video neurotype) by two (disclosure) repeated measures ANOVA with stigma and impression management as covariates revealed no main effects for rater neurotype ($F(1, 257) = .92, p = 0.34$), video neurotype ($F(1, 257) = .001, p = .98$), or disclosure ($F(1, 257) = .09, p = 0.760$). There was, however, a significant interaction between video neurotype and disclosure ($F(1, 257) = 5.53, p = .02$). Post-hoc pairwise comparisons showed no significant effect of disclosure for autistic videos (7.74 [95CI-2.64, 18.11], $p = .143$), but significantly more favorable ratings for non-autistic videos following disclosure, compared to videos without disclosure (20.87 [95CI 12.61, 29.14], $p < .001$). Additionally, autistic participants reported significantly higher anti-autism stigma than non-autistic participants ($F(1, 261) = 33.03, p < .001$) and there was a three-way interaction between video neurotype, disclosure, and stigma score ($F(1, 257) = 3.94, p = .048$), indicating that stigma may influence first-impression formation differently depending on neurotype. There was no significant group difference in impression management ($F(1, 261) = 3.24, p = .073$), indicating that autistic and non-autistic individuals have similar motivations to inhibit prejudiced reactions.

Conclusions: Findings imply that disclosing the absence of a diagnosis may improve perceptions of non-autistic adolescents while disclosing an autism diagnosis may not affect ratings for autistic adolescents. Autistic raters exhibited more stigma than non-autistic raters, providing some insight into internalized stigma within the autistic community. Given the three-way interaction between stigma, disclosure, and neurotype of the person being rated, these findings suggest that efforts to reduce anti-autism stigma should also include autistic individuals.



425.279 An Idiographic Exploration of Masking in Autistic Adults

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Background:

Masking is a frequently reported behaviour in autistic people referring to the use of strategies to conceal autistic traits in social interactions. Previous research has examined masking on the group level through thematic analysis and quantitative methods and identified links with mental health.

Objectives:

This study explores the lived experience of masking and mental health using an idiographic approach and focus on the unique experiences of individuals.

Methods:

Semi-structured interviews were used to gather data. To make the process inclusive to different communication needs, the interviews were conducted online or in-person according to participant preference. Each participant participated in two interviews lasting one hour each. Data were analysed through the idiographic approach of interpretive phenomenological analysis..

To enhance the validity of the results and ensure that the lived experience of the participants is captured accurately, a process of member checking was undertaken. Following data analysis, participants received a plain English summary of the interpretation of their interviews and were given the opportunity to comment on this summary, identify anything they disagree with, and add additional information. These new data points were integrated into the final analysis.

Results:

All participants reported that they held a complicated relationship with masking. For many participants masking served a vital protective function, acting to shield them from the discrimination commonly experienced by autistic people. However, these same participants reported that masking had severe detrimental consequences to their mental health including depression, anxiety, and low self-esteem. For these participants a complex cost-benefits analysis was applied when deciding whether or not to mask – weighing up the benefits of being shielded from discrimination versus the downstream effect masking had on their mental health. Several participants reported that extensive masking since childhood had left them uncertain about many aspects of their own identity, as they struggled to know what was authentic and what was part of the mask. Several of these participants additionally described the process of unmasking as a journey of discovery and exploration wherein they were starting to uncover their real selves. A number of participants shared that their autistic traits were just one aspect of their identity that was subject to masking. Different participants reported masking their gender identity, mental illness, and their nationality. The common thread among these participants was that any aspect of their identity that was marginalised by society was masked as an act of self-protection.

Conclusions:

The study contributes to the growing understanding of masking through centring the voices of autistic people. A complicated relationship between masking and mental health was uncovered as choosing to mask was detrimental to long-term mental health but also acted to shield participants from experiencing discrimination and the consequences thereof. Identity also emerged as a core construct to be considered in discussions of masking. Masking strategies were not uniquely applied to participants' identity as autistic people, but also other aspects of their identity that were marginalised in society and that might make them vulnerable to discrimination.

425.280 Are Adults with Autism (really) Better at Estimating the Thoughts of Others with Autism?

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Background: While prevailing theories suggest that social interaction difficulties are inherent to individuals with autism, the theory of the double empathy problem (Milton, 2012) proposes that these difficulties arise from a mismatch between different neurotypes. The theory predicts more challenging communication between individuals with and without autism, but better communication among individuals with autism. Although qualitative studies on the experiences of individuals with autism seem to support this theory, experimental studies testing the theory are largely lacking.

Objectives: The goal of this study is to test whether adults with autism are better at estimating the thoughts of others with autism than of those without autism.

Methods: 109 adults (55 with autism) took part in an empathic accuracy task, where they watched videoclips of two individuals interacting. Whenever the videoclips was paused, they had to estimate the thoughts of the individuals in the videoclips. To create the videoclips, five dyads – each consisting of one adults with autism and one without autism - were filmed while they got to know each other (unstructured situation) and figured out the rules of a game (structured situation). Directly after, the filmed persons wrote down the thoughts they had while interacting with the other person. Crucially, the participants watching the final videoclips were unaware of the diagnosis of the person in the video. After data collection, four independent raters rated the accuracy of each estimated thought (of the participant watching the video) by comparing them to the original thought (of the person in the video).

Results: In contrast to our hypothesis, adults with autism were not better at estimating thoughts of another adult with autism. Instead, adults with autism were generally less accurate compared to individuals without autism in estimating thoughts of others irrespective of diagnosis.

Conclusions: Our findings do not support the theory of the double empathy problem and are not in line with previous reported experiences of individuals with autism, warranting further investigation

425.281 Are Autism Knowledge, Contact, and Identification Associated with Rapport in Real-World Interactions Among and between Autistic and Non-Autistic Adults?

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Background: Autistic and non-autistic people often communicate less effectively and establish lower rapport with each other than they do with someone of the same neurotype (Crompton et al., 2020). Previous findings suggest that people with more autism knowledge and contact often have more positive attitudes towards autistic people (Gillespie-Lynch et al., 2015). However, it is unclear whether these factors contribute to better real-world social interactions and experiences for autistic people. Further, it is unclear whether autistic people with a strong sense of autism identity establish better rapport with other autistic people.

Objectives: To investigate whether autism knowledge, contact, and identification are associated with real-world rapport among and between autistic and non-autistic adults in same- and mixed-neurotype dyads.

Methods: Forty-nine autistic adults and thirty-nine non-autistic adults (see Table 1) completed surveys to assess autism knowledge and contact. Autistic participants completed additional questions to assess their autistic identity. Participants were then allocated to one of three conditions: autistic dyads, non-autistic dyads, or mixed dyads (1 autistic and 1 non-autistic). Dyads were instructed to engage in an informal conversation for five minutes and complete a rapport measure (Crompton et al., 2020) afterwards about the interaction.

Results: Autistic participants reported significantly higher time spent ($t(82) = 3.91, p < .001$) and greater contact ($t(82) = 2.28, p = .025$) with autistic people than non-autistic participants. Among non-autistic participants, autism knowledge correlated significantly with time spent with autistic people ($r = .37, p < .001$) and the contexts they interact with them ($r = .55, p < .001$). Feeling part of an autistic community for autistic participants was associated with feeling positive about being autistic ($r = .46, p = .002$), which in turn correlated with self-understanding ($r = .34, p = .027$) and comfort disclosing their autism to others ($r = .46, p = .002$). Within autistic-autistic interactions, higher contact with other autistic people ($r = .39, p = .023$) and the contexts in which they interact with them ($r = .36, p = .038$) correlated with rapport; however, no aspects of autistic identity or autism knowledge related to rapport in these interactions. In mixed dyads, autistic participants' autism knowledge ($r = .62, p = .031$) and time spent with autistic people ($r = .61, p = .028$) were associated with their rapport with non-autistic partners but neither autism knowledge nor contact with autistic people were associated with non-autistic participants' rapport with autistic partners.

Conclusions: The current study examined how autism knowledge, familiarity, and identity related to rapport in same- and mixed-interactions. Autistic participants with higher contact with other autistic people expressed greater rapport with other autistic people, suggesting that familiarity with other autistic people may provide interpersonal benefits. However, contrary to expectations, higher autism knowledge and contact with autistic people were associated with greater rapport in mixed interactions for autistic participants but not for non-autistic participants. High autism knowledge and contact for autistic people may be proxies for more social experience and comfort within interactions, which could translate to better rapport with non-autistic people. Further work is needed to determine what predicts rapport with autistic participants among non-autistic people.



425.282 Are Restricted Interests of Autistic Adolescents Linked to Differences in Learning about Peer Preferences?

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Background: Learning about others is a crucial prerequisite for successful social interactions. While previous research has stressed that social cognitive differences and rigidity are separable dimensions of autism (Happé & Ronald, 2008), rigidity may predict social learning capabilities. For instance, restricted interests—a form of rigidity—could lead to less accurate and detailed representations of peer preferences. These social knowledge representations are used for learning in non-autistic groups (Rosenblau et al., 2021). An open question is whether higher rigidity in autistic individuals predicts social learning performance.

Objectives: This study uses a big data approach to investigate the relationship between parent-reported cognitive rigidity, restricted interests, and social learning strategies in autistic early adolescents compared to non-autistic controls. We expect rigidity to predict the use of detailed social knowledge during social learning in autistic individuals. We further expect that a data-driven clustering of early adolescents based on social learning and rigidity will predict autistic traits across participants and autism symptomatology in the autistic group.

Methods: The target sample size is 1000 participants with an autism diagnosis (aged 8-12 years) and 600 age-matched controls (<https://doi.org/10.17605/OSF.IO/8RZNY>). Participants complete three rounds of an online social learning task that involves rating the preferences of three peers on 60 items each. Peer profiles vary in diagnostic group (i.e., autistic / non-autistic) and the variability of preferences (i.e., overall distribution of self-preferences). Learning is quantified by reductions in prediction errors (PEs), defined as the difference between participants' trial-by-trial ratings of peer preferences and subsequent feedback. After the learning task, participants rate their own preferences for all task items. Additionally, parents assess their child's behavior, including rigidity and social cognitive abilities, on several demographic and clinical measures. Here, we report results of a preliminary sample of 296 early adolescents with autism (M age = 10.94 years old, 78.37% male, Social Responsiveness Scale (SRS) total score $M = 101.20$).

Results: Linear mixed effects models conducted in R (www.r-project.org R Core Team, 2014) revealed PE differences based on task profile, such that autistic adolescents' PEs were significantly higher for the autistic profile with the most variability in preferences, and lowest for the non-autistic profile. Participants' PEs did not decrease significantly over the task across profiles. The magnitude of PEs scaled with cognitive rigidity, as measured with the Behavioral Inflexibility Scale. This regressor remained marginally significant when controlling for overall ASD symptom load with SRS total score. When investigating the unique contributions of the Social Communication and Restricted/Repetitive Behavior subscales of the SRS on PEs, only the latter subscale, which measures cognitive rigidity, significantly predicted PEs.

Conclusions: Preliminary analyses suggest that early adolescents with autism are less accurate when making social inferences about autistic vs. non-autistic peers. As expected, cognitive rigidity scales with overall task performance, such that higher parent-reported rigidity predicts greater task-based PEs. We plan to examine social learning strategies in both autistic and non-autistic adolescents as a next step and will additionally consider the role of reported self-preferences.

425.283 Associations between Expressive and Receptive Facial and Vocal Affect Communication Abilities in Autistic and Typically Developing Youth

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Background: Individuals with autism spectrum disorder (ASD) may struggle with expressing emotions through facial or vocal expression (affect production; AP) and/or interpreting these expressions in others (affect recognition; AR). While deficits in social communication are a defining feature of ASD, the relationship between AP and AR difficulties remains unclear.

Objectives: We evaluated expressive and receptive affect communication abilities in youth with autism and typically developing controls (TDC) and investigated relationships between AP and AR abilities in ASD.

Methods: Participants included 160 youth, aged 8 to 16 years. ASD participants (N=113) were 39.8% female with a mean age of 12.3 (SD=2.7) and mean FSIQ of 98.16 (SD=22.0). Controls (N=47) were 51.1% female with a mean age of 12.4 (SD=2.5) and mean FSIQ of 115.85 (SD=10.8).

Participants completed measures to assess their ability to produce and recognize basic emotions (happy, sad, angry, afraid) through facial and vocal expression. Mann-Whitney U tests were applied to evaluate group differences in AP and AR. A two-way repeated measures ANOVA was used to test interaction effects of emotion and diagnostic group. Spearman's correlations were performed to assess relationships between facial and vocal AP and AR.

Results: Participants with autism scored lower on facial and vocal AR ($U = 1552, z = -3.74, p < .001, U = 1413, z = -4.23, p < .001$, respectively) and facial AP ($U = 888, z = -3.47, p < .001$). While no significant group differences were identified for vocal AP, a significant group by emotion interaction indicated that the ASD group was less effective at conveying happiness vocally ($F(3,339) = 3.956, p = .009$, partial $\eta^2 = .034$). As individuals with ASD are at increased risk for depression, a post hoc analysis of covariance was performed to determine if this difficulty conveying happiness through vocalization was driven by the presence of depression. After controlling for depression, the interaction effect remained significant ($F(3,333) = 4.815, p = .003$, partial $\eta^2 = .042$). No other significant interaction effects were identified. Significant correlations were identified between expressive and receptive tasks across facial and vocal modalities. Specifically, facial AP was significantly correlated with vocal AP ($\rho = .743, p < .001$) and facial AR was significantly correlated with vocal AR ($\rho = .547, p < .001$). Vocal AP was significantly associated with vocal AR ($\rho = .399, p < .001$); however, facial AP was not associated with facial AR ($\rho = .195, p = .083$).

Conclusions: Youth with autism had greater difficulty conveying and recognizing emotions via facial and vocal cues. Affect communication skills were strongly associated across facial and vocal modalities, suggesting that receptive and expressive affect communication impairments can manifest broadly and may operate distinctly. Although a subset of participants demonstrated impairments in both facial AP and AR, a linear relationship was not identified. In contrast, vocal AP was significantly associated with vocal AR, potentially due to an underlying deficit in auditory processing, which has been repeatedly demonstrated in autism studies. This may explain why a relationship between AP and AR was seen within only the vocal modality, as auditory feedback assists in evaluating and adjusting the sound of our own speech, whereas visual processing/feedback is not typically available during production of facial expressions.



425.284 Autism Spectrum Traits Predict Better Communicative Reasoning Ability in Late but Not Early Adolescence

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Background:

Challenges in social communication are core characteristics of autism spectrum disorder (ASD) in the clinical population and autism spectrum traits in the general population. Yet recent evidence suggests a more complex relationship between autism spectrum traits and social cognition. For example, nonclinical individuals with high autism spectrum traits are linked with similar or even better social psychological skills relative to those without.

Objectives:

Here, combining tools and methods from developmental psychology, computational pragmatics, game theory, and computational psychiatry, we investigated whether and how autism spectrum traits influence the ability to infer others' communicative intent based on communicative signals and contexts during the transition from childhood to adulthood in a nonclinical sample.

Methods:

A total of 541 subjects (ages 10-20) participated in a referential communication game previously established for examining the neural and cognitive processes of communicative reasoning ability in adults and children. We evaluated autism spectrum traits using the Autism Spectrum Quotient (AQ), a well-validated measure of autism symptoms in nonclinical samples.

Results:

Consistent with prior work, our data show that the ability to recover a speaker's intention develops continuously from childhood into adulthood. Interestingly, autism spectrum traits exhibit divergent effects on communicative performance in subjects at different developmental stages (interaction effect of AQ and age = $0.14, 0.04, P < 0.001$). Higher autism spectrum traits predict better communicative reasoning performance in subjects during their late adolescence (ages 16-20), but lower performance during early adolescence (ages 10-11). Results of computational modeling further show dissociable cognitive operations that are differentially associated with autism spectrum traits at different developmental stages. The association between autism spectrum traits and communicative performance in early adolescence is mediated by the extent to which a subject was engaged in the egocentric processing of communicative contexts (indirect effect = $-0.16, P < 0.01$). By contrast, the association seen in late adolescence is mediated by how well a subject could mentally simulate what a speaker would say given a communicative goal and context (indirect effect = $0.23, P < 0.01$). Finally, the individual differences in the key cognitive operation quantified by the computational modeling of communicative behavior can modulate how autism spectrum traits influence the self-reported intimate exchange of real-life friendship.

Conclusions:

Together, our findings provide quantitative evidence that autism spectrum traits in a nonclinical population differentially influence the ability of communicative reasoning across development. The dynamic effects point to a learnable social strategy for inferring others' intentions by mentally simulating rational goal-directed behavior in context, shedding light on potential ASD interventions.

425.285 Autistic People Differ from Non-Autistic People Subjectively, but Not Objectively in Their Reasoning

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Background: Autism has been associated with difficulties in social interactions and rapid decision-making. The Dual Process Theory of Autism suggests that autistic people, in comparison to non-autistic people, tend to prefer and engage in a more deliberative and less intuitive reasoning style, indicating enhanced rationality in autism. However, this theory has not been systematically investigated across social and non-social domains.

Objectives: This study aimed to explore reasoning styles of autistic people, examining whether they prefer deliberative over intuitive thinking across different domains (social and non-social) or whether they apply consistent strategies in both.

Methods: A total of 24 autistic adults and 24 non-autistic adults, matched for age, gender, and non-verbal cognitive ability, participated in this study. They completed both subjective (self-reported) and objective measures of reasoning. A scenario-based task, covering social and non-social vignettes, was used to assess participants' reasoning strategies in their forced-choice judgments, to determine whether participants maintained a consistent strategy across domains or shifted between intuitive and deliberative reasoning.

Results: Autistic participants reported lower intuition on subjective reasoning measures compared to their non-autistic counterparts. However, on objective reasoning tasks, the reverse pattern emerged, with autistic people providing more intuitive responses. No significant group differences were observed in self-reported deliberation, objective reflectiveness, or forced-choice moral judgments across social and non-social domains.

Conclusions: The findings highlight complexities in reasoning, decision-making, and judgments among autistic people across various domains by suggesting possible discrepancy between autistic people's self-reported preferences and their actual performance.

425.286 Autistic Trait Similarity, Social Interaction Quality, and Empathic Accuracy in Close and Stranger Dyads

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Background: The 'double empathy problem' posits that social interactive difficulties between autistic and non-autistic people are bidirectional, attributable to difficulties interacting across neurotypes (Milton, 2012). To date, studies testing this theory have frequently relied on strangers interacting with each other or participants watching videos of autistic or non-autistic speakers. Less is known about how the double empathy problem impacts social interaction in established social dyads versus strangers, particularly across the broad spectrum of autistic traits, and about whether there are differential impacts on subjective measures of interaction quality versus more objective measures of empathic accuracy (Livingston et al., in press).

Objectives: Using a naturalistic, dyadic paradigm, we quantified relations between partners' autistic trait similarity, subjective impressions of interaction quality, and objective measures of interactive empathic accuracy for both pre-existing close dyads and stranger dyads recruited from the general population.

Methods: Our sample was 50 close dyads and 52 stranger dyads aged 18 to 31 years ($N = 204$ participants). Close dyads (24 close friends and 26 romantic partners) had an average relationship length of 2.72 years ($SD = 3.07y$). Dyads completed an in-person semi-structured conversation in the lab. Afterwards, each participant privately viewed video of that conversation, reported on their own thoughts and feelings during the conversation, and guessed at their partner's thoughts and feelings. Empathic accuracy scores were calculated by comparing each participant's guesses about their partner's mental states to what their partner reported actually thinking or feeling (Ickes, 1993). All participants also completed measures of interaction quality (e.g., "Overall, how would you rate the conversation you had today?") and autistic traits (Autism Quotient [AQ]; Baron-Cohen et al., 2001). Close dyads completed measures of emotional and intellectual relationship satisfaction (Schaefer & Olson, 1981).

Results: Neither close nor stranger dyads showed significant concordance in partners' autistic traits ($r_s < .15$). Autistic trait similarity was not related to empathic accuracy for either close or stranger dyads and was also unrelated to overall relationship satisfaction for close dyads ($r_s < .10$).

However, larger within-dyad differences in autistic traits were related to lower interaction quality ratings for close dyads only ($r(36) = -.58, p < .001$; stranger dyads: $r(50) = .045, p = .75$). Follow-up analyses using an Actor-Partner Interdependence Model (APIM) found that the effect was driven by the dyad member with higher autistic traits score, such that their AQ score impacted both their own and their partner's interaction quality ratings (Figure 1). APIM analyses also indicated that empathic accuracy was not related to subjective interaction quality ratings for either dyad type.

Conclusions: Overall, autistic trait similarity improved subjective experiences of interaction quality, but only for pre-existing close dyads. Additionally, autistic trait similarity did not impact overall relationship satisfaction for those dyads, indicating the importance of considering time scale when interrogating social interactive success. The operationalization of the double empathy problem is also important, given that empathic accuracy did not relate to autistic trait similarity or subjective interaction quality. Future research should continue to investigate how the double empathy problem may impact a wide variety of social interactions for different types of relationships.



425.287 Autistic and Non-Autistic Children's Recounting of Basic and Self-Conscious Emotional Experiences

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Background:

The ability to reflect on one's own emotional experiences is central to socioemotional development. Self-conscious emotions (e.g., guilt, embarrassment), in particular, facilitate social relationships and adherence to societal norms. Although a handful of studies have explored autistic children's recounting of basic and complex emotions (e.g., Losh & Capps, 2006), linguistic analyses of children's recounts across discrete basic and self-conscious emotions are lacking.

Objectives:

Although previous research has shown that autistic children may struggle with identifying self-conscious emotions, recognition tasks or hypothetical situations used to assess this may underestimate their understanding. Using detailed linguistic coding, the purpose of this study was to evaluate autistic and non-autistic children's recounting of personally-experienced basic and self-conscious emotions. Potential predictors of appropriate content included age, autism symptomatology, and receptive vocabulary ability.

Methods:

Twenty-three autistic and 38 non-autistic children participated in the study following IRB approval and parent/child consent. Table 1 shows participant characteristics (e.g., race, test scores). All autistic children had received a clinical diagnosis of autism by a licensed clinical psychologist prior to the start of the experiment, and were provided with services at their school for their autism diagnosis (e.g., assigned a paraprofessional). Children were asked to recount two experiences of each basic (i.e., fear, happy, sad), and self-conscious emotion (i.e., guilt, pride, embarrassment). In a quiet room at the child's school, children's responses were audio-recorded, and then later transcribed and coded by two raters. Each response was coded for appropriateness of the content (0-3), the role of others, length in number of clauses, and number of prompts needed to elicit a response.

Results:

Autistic children provided significantly less appropriate content in recounting self-conscious emotions compared to non-autistic children (see Table 1). However, no significant differences were found between children when recounting experiences of basic emotions. In terms of number of clauses, autistic children produced briefer descriptions of experiences pertaining to guilt and embarrassment, and were less likely to reference others for these emotions than non-autistic children (see Table 1). As shown in Table 2, autism symptomatology predicted appropriateness of content for guilt and pride. In contrast, receptive vocabulary level predicted appropriate content for sadness and embarrassment across children.

Conclusions:

Our findings revealed that autistic children were on par with their non-autistic peers in recounting personally experienced basic emotions, but showed less appropriate and less linguistically sophisticated content for self-conscious emotions. Autism symptomatology predicted appropriateness of children's recounts of guilt and pride, whereas receptive vocabulary level accounted for differences in children's ability to provide appropriate content for sadness and embarrassment. This suggests that both autism symptomatology and language play important roles in communicating about complex emotions in autistic children. In terms of implications, many emotion training programs for autistic children focus exclusively on teaching about basic emotions. Our results suggest that it would be beneficial if programs also focused on promoting children's understanding of discrete, self-conscious emotions.



425.288 Behavioral and Physiological Differences during an Emotion-Evoking Task in Children at Increased Likelihood for Autism Spectrum Disorder and Associations with Problematic Behaviour

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Background: Siblings of children with autism spectrum disorder (ASD) display higher rates of negative emotions and lower rates of positive emotions on parent-reported questionnaires. An under-explored area in younger siblings is behavioural and physiological measurement during emotion-eliciting tasks (e.g., bubbles). Because physiological indices of arousal can register differences in early-developing processes, they may be informative for mechanisms underlying emotional development and ASD symptom emergence.

Objectives: To examine behavioral and physiological responses during an emotion-evoking task in infants who are increased likelihood for ASD (younger siblings; IL) and low likelihood for ASD (no family history of ASD; LL). A secondary objective was to explore relationships between behavioural and physiological indices and internalizing and externalizing problem behaviours.

Methods:

Participants: IL (n=78) and LL (n=46) infants assessed at 6, 12, 18, and 36 months of age.

Activities designed to elicit positive and negative emotions (bubbles, toy play, toy removal, and negative task phases; Sacrey et al., 2021) to measure (1) percent time looking at the task object (gaze); (2) behavioral affect, coded for valence and intensity; and (3) heart rate, calculated as a change from baseline. Parents completed the Child Behaviour Checklist (CBCL) 1.5-5 years when their child was 3 years old.

The Autism Diagnostic Observation Schedule 2nd Edition, Autism Diagnostic Interview-Revised and clinical impression were used to inform diagnostic impression at 36 months of age to classify participants into three groups: LL (n=46), IL not classified with ASD (IL non-ASD; n=59), and IL classified with ASD (IL-ASD; n=19).

A series of linear mixed models with group (IL-ASD, IL-non-ASD, LL) and age (6, 12, 18) as the independent variables and scores on each phase of the EE-Task for heart rate, affect, and gaze as the dependent variables were run. Relationships between behavioural-physiological indices and internalizing and externalizing problem behaviours on the CBCL were also examined.

Results: The IL-ASD group displayed higher levels of negative affect during toy removal ($p=.03$) compared to IL-non ASD and hair brushing ($p=.009$) compared to the LL; the IL-ASD spent less time looking at bubbles at age 12 months ($p=.038$) compared to the other two groups. Further, the IL-ASD group showed a greater increase in heart rate from baseline during toy removal ($p=.007$) compared to the other two groups. For the associations with the CBCL, at 6 months, problem behaviours were associated with affect during face washing ($p < .05$). At 12 months, problem behaviours were associated with heart rate and affect during toy removal and negative tasks, as well as gaze during negative tasks ($p's < .05$). At 18 months, problem behaviours were associated with gaze during negative tasks ($p < .05$).

Conclusions: These results suggest that IL children diagnosed as ASD show differences in affect, gaze, and heart rate during an emotion-evoking task, which are associated with internalizing and externalizing problem behaviours at age 3. As such, behavioral and physiological reactivity during emotionally-evocative tasks may inform early intervention approaches for infants who show early signs of ASD, with potential implications for understanding mechanisms related to emerging ASD.

425.289 Child Emotional Regulation Mediates the Association between Parenting Stress and Behavior Problems in Autistic Toddlers

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Background:

Parents of children with ASD often experience elevated parenting stress, which has been consistently associated with an increased behavior problems in young autistic children (Zaidman-Zait & Duku, 2014). Additionally, lower emotional regulation in autistic children strongly relates to increased behavioral problems (Berkovits & Eisenhower, 2017). Studies have also shown that parenting stress is associated with child emotional regulation in children with developmental delays (Chan & Neece, 2018). These suggest that a child's ability to regulate emotion can explain how parenting stress affects child behavioral outcomes. However, studies examining the interplay between these constructs altogether in young autistic children are rare. Understanding this mechanism can provide insight into the more targeted intervention for young autistic children.

Objectives:

To examine whether child emotional regulation mediates the association between parenting stress and behavior problems in autistic toddlers.

Methods:

The sample included 51 autistic toddlers (72.5% male) aged 18-35 months and their caregivers (88.2% mother). Parenting stress was measured using the Parent Stress Index-Short Form (PSI-SF), with Parental Distress, Parent-Child Dysfunctional Interaction, Difficult Child subdomain T-scores. The Emotional Regulation Index from the Behavior Rating Inventory of Executive Function (BRIEF) was used. Internalizing and externalizing behavioral problems were captured by the Child Behavioral Checklist (CBCL). Verbal and non-verbal developmental quotients (DQs) were assessed using the Mullen Scales of Early Learning (MSEL). Some children (n=30) were reassessed 12 months after their initial assessment (T2). Pearson correlations were used to examine associations among all variables. Stepwise hierarchical regressions were conducted prior to mediation analyses following Baron and Kenny's (1986) model to examine whether parenting stress influenced children's behavior problems while considering child emotional regulation, as well as child/caregiver age, gender, and non-verbal DQ. Mediation analyses using PROCESS macro were conducted to examine whether T1 child emotion regulation (M) mediates the impact of T1 parenting stress (X) on child concurrent and future behavior problems (Y), while controlling for factors mentioned above.

Results:

Higher parenting stress (PSI scores) was significantly correlated with poorer child emotional regulation and internalizing/externalizing problems at both T1/T2 ($r's .45-.71, p's < .01$). Child emotional regulation was also correlated with internalizing/externalizing problems ($r's .40-.65, p's < .01$). Regression analyses revealed that PSI scores except for Parental Distress significantly predicted T1/T2 internalizing/externalizing problems ($p's < .01$). However, when child emotion regulation was included in the model, which significantly predicted T1/T2 internalizing ($b=.368/b=.557, p's < .01$) and externalizing problems ($b=.59/b=.42, p's < .01$), the effects of PSI scores were not significant anymore. Similarly, the mediation analyses indicated that child emotional regulation fully mediated the indirect effects of the PSI Parental Distress on internalizing/externalizing problems at T1 ($b=.22, CI=[.06,.47]/b=.33, CI=[.11,.59], p's < .01$). Longitudinal analyses revealed a similar significant indirect effect on T2 internalizing problems ($b=.33, CI=[.02,.78] p < .05$).

Conclusions:

Consistent with earlier findings (Lin et al., 2020), this study showed that higher parenting stress significantly predicts behavior problems in autistic toddlers. Importantly, this is one of the first studies to show that child emotion regulation fully mediates this association. Therefore, targeting emotional regulation difficulties and supporting caregivers to manage stress should be a key intervention target for autistic toddlers.



425.290 Children with ASD Exhibit Heterogeneous Social Competence Based on Their Theory of Mind Developmental Stages: Insights from a Refined Analysis

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Background: Children with autism spectrum disorder (ASD) often encounter difficulty in social competence (SC), largely attributed to their theory of mind (ToM) challenges. This is because ToM is to interpret mental states of self and others. However, few studies examined the SC across ToM developmental stages into three key dimensions: social skills elements (SSE), social reciprocity (SR), and social adjustment (SA) in children with ASD.

Objectives: To investigate differences in SC across three ToM developmental stages in children with ASD.

Methods: A total of 58 children with ASD aged 3 to 12 ($M=5:10$, $SD=1:8$) and their caregivers participated in this study. Children's SC was assessed across three dimensions (i.e., SSE, SR, and SA) using the Observational Social Competence Assessment (OSCA). Children's ToM was assessed using the Theory of Mind Inventory, Second Edition (ToMI-2), which categorized children into three groups: not developed/early, basic, and advanced ToM developmental stages. Analysis of covariance (ANCOVA) was employed to compare SC across the ToM groups, controlling for age and verbal comprehension.

Results: The three ToM groups showed an increasing trend in overall OSCA scores, with the advanced group scoring significantly higher than the early ToM group ($p=0.016$). A similar pattern was observed for SR ($p=0.042$) and SA ($p=0.039$), but not for SSE. These results indicate that while overall SC, SR and SA, increase with the ToM development, a notable distinction only becomes evident after reaching advanced ToM stage. Further item-level comparisons within the SR dimension revealed significant differences between the early and advanced groups in the quality of initiation ($p=0.030$) and response behaviors ($p=0.026$), and breadth of reciprocal behaviors ($p=0.032$). In the early group, the initiation and response behaviors were difficult to understand and struggled to maintain exchanges on any topic during interactions. In contrast, a greater proportion of children in the advanced group exhibited contextually appropriate initiation and response and extended interactions into daily topics. Additionally, the quality of initiation also distinguished the basic from the advanced ToM groups ($p=0.029$), indicating initiation requires more complex ToM to align with social situations. Regarding the depth of reciprocity behaviors, the advanced group showed greater depth in sharing emotions, events and comments than the basic ToM group ($p=0.029$).

In the SA dimension, comforting behaviors showed significant differences between the early and basic groups ($p=0.023$), and early and advanced groups ($p=0.003$). Although no significant differences were found in turn-taking, helping, and cooperating, similar patterns emerged, with the early group performing worse than the other two groups. This indicates abilities beyond basic ToM are crucial for comforting and may also play a role in other SA behaviors.

Conclusions: Children with higher ToM stages demonstrated significantly better SC, with advanced ToM being superior performance.

Specifically, ToM development was closely associated with the quality, breadth and depth of SR, and comforting in SA. However, due to the relatively small sample size and the reliance on caregiver-reported ToM assessment, future large-scale studies are recommended to investigate the influence of both ToM knowledge and real-life performance on SC in children with ASD.

425.291 Children with Autism Spectrum Disorder Exhibit Heterogeneous Social Competence Based on Their Verbal Comprehension Abilities

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Background: Children with autism spectrum disorder (ASD) present highly heterogeneous neurodevelopmental profile, particularly in verbal comprehension and social competence. Social competence, which refers to the ability to engage with others, involves three dimensions: social skill elements (SSE), social reciprocity (SR), and social adjustment (SA). However, previous research has seldom conducted a detailed analysis of the relationships between verbal comprehension ability and these specific dimensions of social competence in children with ASD.

Objectives: This study aimed to examine the associations between verbal comprehension and social competence including with its three dimensions of SE, SR, SA in children with ASD, and to compare social competence across different levels of verbal comprehension within this population.

Methods: A total of 91 children with ASD participated in this study (mean age=69.29 months, $SD=16.77$, range=36-125 months). Children's social competence was assessed with the Observational Social Competence Assessment (OSCA) with its three dimensions of SSE, SR, and SA. Their verbal comprehension was assessed using verbal comprehension index (VCI) from either the Wechsler Intelligence Scale for Children – Fourth Edition (WISC- IV) or the Wechsler Preschool and Primary Scale of Intelligence – Fourth Edition (WPPSI- IV). The children with ASD were divided into three groups: lower ($VCI < 85$), average ($VCI = 85-115$), and higher groups ($VCI > 115$). Pearson correlation coefficients were used to examine the associations between the OSCA scores and the VCI. Analysis of covariance (ANCOVA) was used to compare the three VCI groups with the OSCA total and dimension scores across the three VCI groups while controlling for age.

Results: The VCI significantly correlated with the OSCA total score ($r=0.74$, $p<.05$) and each of its three dimensions: SSE, SR, and SA ($r=0.72$, 0.71 , and 0.63 respectively, $p<.05$). Significant differences were found among the three VCI groups in the OSCA total score ($F_{(2, 87)}=22.92$, $p<.05$) and in all three dimensions: SSE, SR, and SA ($F_{(2, 87)}=20.67$, 23.46 , and 4.25 respectively, $p<.05$). Specifically, the higher VCI group outperformed the lower VCI group in the OSCA total score and dimension scores (all $p<.0001$), and the average VCI group also showed significantly higher scores compared to the lower VCI group (all $p<.0001$). No significant difference was found between the higher and average VCI groups ($p=.30\sim.46$). A more detailed analysis of all items of the three dimensions showed significant differences across the VCI groups for most items ($F_{(2, 87)}=4.83\sim 21.04$, all $p<.05$), except for questioning behaviors ($F_{(2, 87)}=3.10$, $p=.05$) in the SR dimension and comforting ($F_{(2, 87)}=0.23$, $p=.80$) in the SA dimension.

Conclusions: This study demonstrates that children with ASD exhibit heterogeneous social competence based on their verbal comprehension abilities, and a clear association between their verbal comprehension and social competence. This insight could guide more nuanced intervention strategies that address aspects of social competence based on the verbal comprehension in children with ASD.

425.292 Collaboration Is Key: Unlocking the Neural Correlates of Autistic Friendships and Wellbeing

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Background: Friendships are crucial to promoting adolescent wellbeing. Despite similar desires for forming friendships, autistic adolescents have fewer friends, less contact with friends, and lower quality friendships than neurotypical peers (Kasari et al., 2011). Atypical social attentional processes in autism may lead to poor interpersonal relationships, including friendships, and in turn impact wellbeing (Pavlova, 2012). Yet, poor social attention may not fully explain friendship experiences in autistic adolescents as many report having successful and beneficial friendships (Black et al., 2022). Therefore, a better understanding of the underlying neural mechanisms during friendship interactions and, in turn, their impact on autistic adolescent wellbeing is needed. Since collaboration is often strongest among friends and aids in developing cognitive and social skills (Sills et al., 2016), collaborative environments may be an important context in which we can better understand how neurobiological states influence autistic friendships and wellbeing.

Objectives: First, we aim to identify social attentional neural correlates unique to real-time autistic friendship interactions during goal-directed collaborative conversations. Second, we aim to investigate how social attentional neural correlates impact subsequent wellbeing and if these relationships differ between social contexts.

Methods: Preliminary data from five autistic adolescents and two neurotypical adolescents (9-17 years-old) across six dyadic sessions were included in these analyses (data collection ongoing). Participants completed a battery of interactive paradigms either with a friend or a stranger. During the goal-directed collaborative task (Figure 1), participants and their respective partners were shown an image (each person with a different photo) and then were asked to talk together to find the differences between the pairs. Electroencephalography (EEG), electrocardiogram (ECG), behavioral, and self-report data were collected from each dyadic partner during and after each session. We focus on frontal alpha asymmetry (FAA) as a neurobiological correlate of social attention that is associated with social communication abilities in autism (Neuhaus et al., 2023) and often conceptualized as reflecting approach/avoidance processes (Harmon-Jones & Gable, 2018). Additionally, we evaluate relationships between FAA, ECG, self-report, and behavioral data to better characterize associations between social attention, communication, and wellbeing.

Results: Autistic participants demonstrated slightly more approach-like (increased right FAA) neurobiological signatures ($M=1.50$, $SD=1.32$) than neurotypical adolescents ($M=1.12$, $SD=0.73$). Additionally, friend sessions were slightly less approach-like ($M=1.43$, $SD=2.20$) than stranger sessions ($M=1.51$, $SD=1.08$; Figure 2). Initial relationships between FAA and post-session wellbeing also indicated trending positive relationships between FAA and feeling satisfied ($r=0.49$, $p=0.074$) and content ($r=0.44$, $p=0.116$) for all participants. Finally, self-reported negative feelings following stranger sessions were negatively correlated with FAA ($r=-0.8$, $p=0.018$), such that as FAA became more approach-like, participants indicated less negative affect.

Conclusions: These findings highlight neurobiological correlates that are sensitive to contextual differences during goal directed collaborative conversations and initial impacts on wellbeing. Notably, this is one of the first studies that uses interactive tasks to build a more thorough conceptual model of friendship and wellbeing in autistic adolescents. Our overarching goal is to continue to identify individual strengths and mechanisms in autistic adolescents that aid in building and maintaining optimal friendships and subsequently improve wellbeing.

**425.293 Collective Imagination in Pretend Play: Comparison of Robot-Mediated Interactions with TD and ASD Toddlers**

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Background: We can imagine non-existing things and events; humans have collectively produced and shared numerous stories and techniques, thus creating cultures. Here, we present a case study of how such co-imagination and co-creation emerged in kindergarten children, implicating the cognitive process underlying the development of communication and sociality. Friston's "predictive coding model" claims whatever we perceive in the world is strongly conditioned by an internally produced predictive image, which we project onto reality. The idea directly implies that schizophrenic hallucinations would emerge from abnormally strong and rigid predictions, but also that ASD's enhanced perceptual functioning (Mottron), which forcefully attracts one's attention to incoming piecewise information, would distract one from such top-down projection needed for interpreting the reality.

Objectives: We extend the idea to "collective imagination/expectation" as the fundamental mechanism of our social communication, where the participants project their predictive expectations onto the physical world (Figure 1). Those projected images may be incongruent with each other, but partially congruent to make sense of their actions. As each participant acts on the reality, others' responding actions would strengthen or weaken the prediction; thus, each can update their hypothetical predictions to fit into the concordance. This process is fundamental to our social communication. We here investigate how neurotypical and ASD children engage in or fail in "collective imagination/expectation."

Methods: We conducted a longitudinal observation of a group of neurotypical children (3-year-olds) at a kindergarten and a group of ASD children (3-to-4-year-olds) at a daycare center. In each setting, we introduced a simple robot to the children's playroom with their familiar toys, and we observed how they played with the robot (Figure 2). Throughout the observations, the robot was tele-controlled by researchers in a remote room to produce socially meaningful behavior. We video-recorded the children's interaction with the robot as well as their mutual interaction, which we then analyzed with an ELAN-like system quantitatively (by type and time of actions, etc.) and qualitatively (by role assignment, pretense and symbolic attitude, etc.).

Results: For the ASD children, we observed various dyadic interactions with the robot, but virtually no pretense or symbolic play. The ASD children often played with the robot alone, not having any company. They enjoyed interacting with the robot in a playful mood but did not project their imaginary expectations. On the other hand, neurotypical children showed a lot of group activities, such as playing house, with the robot. They often assigned some roles and symbolic meanings to the robot and objects. The qualitative analysis suggested that the children first had slightly different expectations (e.g., gender, roles, likes, and dislikes) of the robot and different interpretations of the objects, but they gradually converged into a shared range as they mutually exchanged actions and speech to the robot and objects.

Conclusions: From our observations of child-robot interactions, we identified several phenomenological evidence of "collective imagination/expectation" as the fundamental process of social communication. We are building a computational model of the mutual convergence of predictions and its disorders in ASD.



425.294 Comparing Empathic Responses in Different Components and in Different Emotion Situations in School-Aged Autistic Children to Non-Autistic Children

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Background: Empathy, which is an ability to understand and share others' feelings (Singer, 2006), is composed of three component stages (Watson & Bird, 2020). In Stage1, after an individual noticing another person's feeling, he/she correctly interprets that person's emotional behaviour (Cognitive Empathy/CE). In Stage2, he/she feels for the person (Affective Empathy/AE). In Stage3, the individual responds to that person's emotion verbally and/or behaviourally (Prosocial Behaviour, PB). Prior studies have shown that autistic individuals lack empathy (e.g. Baron-Cohen & Wheelwright, 2004). However, there is no consensus on which stage(s) is/are related to such deficits (reviews in Song et al., 2019). Besides, many of the previous studies did not explore all three components simultaneously and used self-report measures (reviews in Fatima & Babu, 2023). Furthermore, autistic individuals respond differently to positive and negative emotions (e.g., Lamm et al., 2011). Thus, this study systematically investigated empathic responses in different component stages and in different emotion situations in autism. The findings will inform clinicians and researchers about the assessment and intervention for empathy in autism.

Objectives: The present study examined CE, AE, and PB in different emotional situations in autistic children and neurotypical children. We hypothesized that autistic children have poorer CE, AE, and PB than neurotypical children(H1) and such deficits are found in all kinds of emotional situations(H2).

Methods: 30 Chinese-speaking autistic children (25 males) aged 5-8 (mean=6.98) with verbal IQ above 85 (mean=97.23) and 24 age- and IQ-matched neurotypical children (18 males) were recruited via advertisement posted online. The autism diagnoses were confirmed by ADOS-2. Autistic children had lower Theory of Mind scores than controls. All children watched 8 videos describing emotional situations, two each on happiness, sadness, anger, and fear respectively, and answered five questions for each video (CE: "How does the main character feel?"; AE: "Why does he feel like this?"; AE: "How do you feel for his feeling?"; PB: "What should his friend do/say?"; PB: "What would you do/say if you were his friend?"). One mark was given for each correct answer.

Results: Figures 1 and 2 show the summary. The group effect was significant: autistic children had lower accuracy than neurotypical children across all empathy components and emotion situations, $F(1,52)=10.32$, $p<.002$, $\eta^2=.17$. The emotion effect was significant, $F(1,52)=13.58$, $p<.001$, $\eta^2=.34$: The accuracy was highest in happy situations across all questions, followed by sad, fearful, and angry situations. Participants were significantly more accurate in sad situations than in fearful and angry situations. There was no significant difference between fearful and angry situations. The question effect was significant, $F(1, 52)=207.74$, $p<.001$, $\eta^2=.80$: All children had higher accuracy in CE than in AE, with PB the lowest. When answering the PB questions, children tended to offer solutions to solve the problems for the main characters instead of showing empathy, especially when taking main character's perspectives.

Conclusions: Our hypotheses were supported. Autistic children have less empathic responses in all components than neurotypical children. Intervention should particularly focus on the empathic responses and appropriate prosocial behaviours in fearful and angry situations.

**425.296 De-Gendering in Mental Representations of Autistic Women and Men: Implications for Mechanistic and Infantilistic Forms of Dehumanization**

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Background: Autism as a pathology has been thoroughly researched; however, comparatively less work has explored its role as a social identity that can inform impressions of autistic adults. Limited research on impressions of autistic adults has primarily focused on male autistic targets. Accordingly, unanswered questions remain involving how autism might intersect with other social identities (e.g., gender) in shaping impressions. **Objectives:** We aimed to determine whether and how impressions of autistic men and women differ from those of neurotypical men and women. Specifically, we examined the ways that autistic men and women are de-gendered and dehumanized compared to their neurotypical counterparts. We also tested whether non-autistic and autistic participants differ in their impressions of each target group.

Methods: In the first two experiments, non-autistic participants were randomly assigned to evaluate one of four target groups: autistic women, autistic men, neurotypical women, or neurotypical men. In Experiment 1, participants first rated their assigned group on their likelihood of possessing masculine (e.g., competitive, dominant) and feminine traits (e.g., nurturing, sympathetic; Martin & Mason, 2022). Next, they completed measures assessing the mechanistic dehumanization (Bai & Zhao, 2024) and animalistic dehumanization (Kteily et al., 2015) of their assigned target group via pictographic scales displaying ascending silhouettes from highly machine-like (i.e., calculator) or animalistic (i.e., ape) to more human-like. In Experiment 2, participants rated their assigned target group on the same gendered traits. They also rated their assigned target group's likelihood of possessing childlike traits (e.g., gullible, naïve; Berry & McArthur, 1985) and completed a measure assessing the infantilization of their assigned target group via a similar pictographic scale displaying ascending silhouettes from highly childlike (i.e., crawling baby) to more adultlike. Finally, in Experiment 3, autistic and non-autistic participants rated all four target groups on the same three ascent scales and a feeling thermometer measure of general evaluations.

Results: Across experiments, autistic men and women were de-gendered (i.e., rated lower on gender-consistent traits), mechanistically dehumanized, and infantilized more than their neurotypical counterparts. Furthermore, the mechanistic dehumanization and infantilization of autistic targets were mediated by their de-gendering. Additionally, both autistic and non-autistic participants mechanistically dehumanized and infantilized autistic targets more than neurotypical targets, though these effects were weaker for autistic participants. Both participant groups displayed ingroup preferences on animalistic dehumanization and general evaluations.

Conclusions: Autistic men and women were viewed less favorably than neurotypical men and women, particularly by non-autistic participants. These negative impressions were especially prevalent in areas where specific stereotypes of autism exist, such as viewing autistic people as more childlike or machine-like. Furthermore, these stereotypic impressions, which suggest a stripping away of gendered traits from autistic people, were held (albeit more weakly) even by autistic participants.

425.298 Do Autistic Children Share with People in Pain: The Role of Empathy in Prosocial Behavior

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Background:

Prosocial behavior plays an important role in human social interactions and has been regarded as a key social skill for children's development (Decety et al., 2021). Empirical studies are revealing reduced prosocial behavior in autism (Ryan-Enright et al., 2022). Empathy serves as a primary proximate mechanism that motivates prosocial behaviors (Jensen, 2016). However, autistic individuals have also been reported to show atypical patterns of empathy (e.g., Song et al., 2019; Li et al., 2024).

Objectives:

The current research investigated prosocial behavior in autistic children and how it is influenced by empathy in two interrelated studies. Study 1 examined whether empathy elicits prosocial behaviors indexed by sharing. We asked autistic and neurotypical (NT) children to share in an empathy-induced or a non-empathy-induced situation. We then examined the association between children's dispositional empathy measured by parent-reported questionnaires and empathy-induced sharing. Study 2 examined whether situational empathy would influence children's prosocial behavior. We adopted a pain-related empathy task to measure visual attention and emotional arousal during situational empathy using eye-tracking techniques. We then analyzed whether emotional arousal and visual attention to others' pain during situational empathy could predict children's empathy-induced prosocial behavior.

Methods:

In Study 1, seventy-nine 4- to 7-year-old autistic children and 81 age- and IQ-matched NT children participated in an adapted Dictator game (Table 1), sharing stickers with an anonymous child who was suffering in pain (i.e., empathy-induced condition) or busy at home (i.e., non-empathy-induced condition). Then, children's dispositional empathy was assessed using the Griffith Empathy Measure-Parent Ratings (GEM-PR; Dadds et al., 2008). Last, we explored the relationship between children's levels of dispositional empathy and empathy-induced sharing. In Study 2, thirty-nine 4- to 7-year-old autistic children and 37 age-matched NT children participated in a pain-related empathy task (Table 1). We measured children's visual attention and emotional arousal to others' pain during situational empathy using eye-tracking techniques. We then asked children whether they would share stickers with an anonymous child in the empathy-induced situation, as we did in Study 1. Finally, we examined whether emotional arousal and visual attention to others' pain during situational empathy could predict children's empathy-induced sharing.

Results:

Study 1 found that empathy elicited sharing behaviors in both autistic and NT children, while autistic children shared less than NT children (Figure 1a). Meanwhile, the level of dispositional empathy positively predicted empathy-induced sharing in both groups of children. Study 2 revealed emotional hypo-arousal as well as reduced visual attention to others' pain during situational empathy in autistic children (Figure 1b). More importantly, higher levels of emotional arousal to others' pain indexed by pupil dilation predicted more empathy-induced sharing in both groups of children.

Conclusions:

Our findings highlight the important role of empathy in eliciting prosocial behavior in autistic children, address a research gap in this area, and offer implications for clinical services aiming at enhancing social skills in autism.

**425.299 Early Joint Attention Behaviors in Autism Spectrum Disorder: Are There Sex Differences?**

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Background: Autism spectrum disorder (ASD) is estimated to affect males more than females; however, more recent studies have suggested that the prevalence rate in females has been historically underestimated, leading to many females being under-identified or misdiagnosed, especially in early childhood. It has been suggested that females might present a distinct ASD phenotype compared to males. Early signs of ASD can be detected in the first and second years of life. Impairments in Joint Attention (JA) are one of the earliest indicators of ASD diagnoses and are often included in developmental screening and diagnostic tools. JA is characterized by the ability to follow the gaze of others and share common interests with other individuals or objects. In developmental screening tools, JA behaviours have been equally assessed in male and female children. However, little is known about whether JA patterns differ in early childhood in females from males.

Objectives: In this study, we aimed to examine JA behaviours and sex differences in relation to ASD diagnosis in young children with an increased familial risk of developing ASD.

Methods: In this study, behavioural data from 869 children (61.2% males) with an increased familial risk for developing ASD were collected as part of the ACE Study and IBIS Network from the National Database for Autism Research (NDAR). In this sample, 173 children received an ASD diagnosis (59.5% males). Behavioural data from the Autism Diagnostic Observation Schedule (ADOS) was collected in the second year of life and was used to examine early JA behaviours. The mean age of the ADOS was 24.8 months. Data from two items related to JA behaviours, responding to joint attention (RJA) and initiating joint attention (IJA), from the ADOS were used for further analysis. Binomial logistic regression analyses were conducted to assess the relationship between RJA and IJA behaviours and biological sex within Diagnostic (Dx) groups (i.e., ASD vs. no-ASD). The outcome variable was biological sex (male/female); the predictor variables included were RJA and IJA behaviours, controlling for age. **Results:** Using a regression method, it was found that, in children who received an ASD diagnosis, RJA behaviours ($B=-0.570$, $aOR=0.566$, $p=0.015$) classified male and female children. In contrast, IJA behaviours were not statistically significant ($B=-0.14$, $aOR=0.869$, $p=0.577$). In the model, RJA behaviours could differentiate males and females in the group that developed ASD, correctly classifying 60.1% of the cases. For the group who did not develop ASD, the model did not accurately predict biological sex.

Conclusions: Findings suggest that RJA behaviours may look different in females with a familial risk for developing ASD who received an ASD diagnosis compared to males at two years of age. Specifically, children who presented lower scores on RJA measures, which means less impaired RJA behaviours, and received an ASD diagnosis were more likely to be females. A better understanding of JA behaviours in females could aid in developing more sensitive tools to detect the female ASD phenotype at an early age.

425.300 Emotion Dysregulation Related Impairment Is Elevated across Social Contexts in Autistic Preschoolers

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Background: Although not part of the core criteria of autism, accumulating evidence indicates that emotion dysregulation is common in autistic individuals across the lifespan (Cibralic, Kohlhoff, Wallace, McMahon, & Eapen, 2019; Conner et al., 2021). Challenges like meltdowns, outbursts, and tantrums can impact child and family life across contexts by damaging peer and family relationships, reducing community engagement, and impacting school participation and performance. To date, no research has examined how emotion dysregulation impacts various aspects of child and family life in autistic children as compared to their non-autistic peers.

Objectives: The present study aimed to characterize impairment associated with emotion dysregulation across various social contexts (home life, out-and-about, with siblings, with peers, with nonparental adults, and in school/day care) in children with and without an autism diagnosis.

Methods: Participants were parents of 3- and 4-year-old (mean age: 4.12 (0.55)) children with ($N=30$) and without ($N=37$) autism. Parents were interviewed using an adapted version of the Early Childhood Irritability-Related Impairment Interview (E-CRI), which assesses impairment (0 = no impairment; 3 = severe impairment) associated with irritable, angry moods and tantrums across six different contexts: home life, out-and-about in the community, with siblings, with peers, with nonparental adults, and in school/day care. A linear mixed model was used to analyze the effects of diagnostic group, context, and the interaction between group and context on impairment severity scores, controlling for child age, gender, IQ scores, and adaptive communication ability.

Results: The model revealed a significant main effect of diagnostic group, $F(1,57.22) = 16.06$, $p<.001$ and a significant main effect of context, $F(5,261.6) = 22.4281$, $p<.001$. Autistic children had more severe impairment than non-autistic children. Post-hoc pairwise comparisons on impairment across contexts revealed that impairment in home life was higher than impairment across all other contexts (see Figure 1). While the overall interaction between diagnostic group and context was not significant, $F(5, 261.6) = 1.51$, $p = 0.18$, an exploratory post-hoc analysis revealed an interaction between diagnostic group and impairment out-and-about versus impairment at home. Specifically, the autism group had no difference in impairment at home versus out-and-about, while the non-autism group had significantly reduced impairment out-and-about compared to at home.

Conclusions: While prior research has established elevated emotion dysregulation in autistic children, this is the first study, to our knowledge, to examine how emotion dysregulation impacts child and family life across social contexts. Autistic children had more impairment across all contexts than their non-autistic peers. In general, emotion dysregulation impacted home life more than any other context, though autistic children had as much impairment out-and-about in the community (e.g., in grocery stores, church, extracurriculars, restaurants, etc.) as they did at home. Despite the clear impact of emotion dysregulation on autistic children and their families across social contexts, emotion dysregulation is rarely the target of early intervention. This study calls attention to the urgent need and broad potential impact of targeting emotion dysregulation early in life.



425.301 Emotion Regulation in Children with Autism Spectrum Disorder and Attention Deficit Hyperactivity Disorder: A Scoping Review

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Background: According to James J. Gross, emotion regulation (ER) refers to the process by which individuals manage their emotions for their emotional experience and expressions. Recent research has found that children with poor ER skills tend to struggle with social interactions and peer relationships. Autism spectrum disorder (ASD) and attention deficit hyperactivity disorder (ADHD) are common neurodevelopmental disorders in children, each with distinct symptoms. However, studies suggest that children with either ASD or ADHD experience significant difficulties with ER.

Objectives: Therefore, this study used a systematic and iterative approach to identify and synthesize an existing and emerging body of literature to explore the differences in ER between children with ASD and ADHD.

Methods: A scoping review was conducted using keywords relevant to ASD, ADHD, and ER across multiple databases, including PubMed, Cochrane Library, Embase, CINAHL, and Google Scholar. A total of 469 studies from 2000 to 2024 were identified. Among them, 14 studies focusing on 4- to 12-year-old children met the inclusion criteria in this review.

Results: This review revealed that children aged 4 to 12 with ASD and ADHD both face greater challenges in effectively regulating and expressing their emotions compared to typically developing (TD). Children with ADHD tend to display heightened emotional responses and react more intensely to emotionally arousing situations. During negative situations, they tend to focus on the obstruction, thus maintaining a high arousal level without solving the problems. Their ER is less effective, even though they understand the social rules, leading to greater levels of positive and negative emotions, which often in turn contribute to behavioral issues. Similarly, children with ASD show increased emotionality, but tend to rely on maladaptive ER strategies (e.g., suppression, avoidance) and use adaptive strategies (e.g., cognitive reappraisal, seeking social support) less frequently. This reliance on less effective strategies hindered their ability to describe and identify emotions and decreased insight into more complex emotional processes, and thus made them unable to regulate emotions, resulting in reduced emotional expression compared to TD children.

Conclusions: ER difficulties pose a significant challenge for both children with ASD and ADHD. The main difference between these two groups lies in the outcome of ER efforts: children with ADHD tend to display a wider range of emotion including both positive and negative emotions, whereas children with ASD show more restricted emotional expressions. Although several studies have explored the ER strategies commonly used by ASD children, the different types of strategies applied for regulating negative and positive emotions remain unclear. Also, there is limited research on ER strategies among children with ADHD. Future research should focus on understanding the ER strategy patterns in both children with ASD and ADHD, which could enable more tailored approaches to addressing ER difficulties in both groups from a more nuanced perspective.

425.302 Emotional Expressions Trajectories in Autistic and Non-Autistic Children: Insights from Adapted Observational Contexts
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Background:

Studies suggest that autistic children, whether at preschool or school age, tend to express fewer positive emotional expressions in contrast to more neutral and negative ones compared to non-autistic (Trevisan et al., 2018). Certain emotional expressions are also challenging to recognize.

However, when exposed to the preschool version of the Montreal Stimulating Play Situation (MSPS) autistic children showed similar amount of positive, negative, and neutral emotional expressions as non-autistic, despite some unrecognizable/ unknown emotional expressions (Jacques et al., 2022). Utilizing a context tailored to school-age autistic children could provide deeper insights into the developmental trajectory of their emotional expressions.

Objectives:

1) Document the developmental trajectory of emotional expressions in autistic and non-autistic children, using the preschool and the new school version; 2) Compare emotional expressions at school-age between the two groups; 3) Examine how cognitive profiles may influence emotional expressions.

Methods:

Twenty-five autistic and 25 non-autistic children participated in the MSPS, with an average age of 47.7 and 43.6 months in the preschool version and 130.5 and 132.2 months in the school version ($p = 0.078$). Two naïve raters coded positive, neutral, negative and unknown emotional expression on Observer XT ©. Frequency, duration and proportion of children displaying emotional expression were analyzed. Wilcoxon Signed-Rank and McNemar tests were used for intragroup comparisons over time, while Mann-Whitney U tests were used for intergroup comparisons at school-age. Mixed longitudinal regressions were performed to explore the interaction of emotional expressions with time and group, and with IQ (WISC-V FSIQ) and NVIQ (Raven's 2), with only the results presented if significant in both duration and frequency. Holm-Bonferroni corrections led to an adjusted alpha level of 0.05.

Results:

From preschool to school age, autistic children showed an increase in both frequency and duration of neutral and unknown emotional expressions. For negative emotional expressions, duration decreased for autistic children, while frequency increased in both groups, with less pronounced changes for autistic children. Non-autistic children showed a decrease in positive emotional expressions over time in terms of duration, frequency and proportion.

At school-age, autistic children displayed positive and unknown emotional expressions more frequently and for longer along with a higher frequency of neutral emotional expressions than non-autistic children. Positive emotional expressions were expressed by 80% of autistic and 64% of non-autistic children, while negative emotional expressions were less common (28% and 32%, respectively), with no significant differences between groups.

Over time, higher FSIQ scores are linked to increased neutral emotional expressions in non-autistic children. Higher scores in both IQ and NVIQ measures are related to reduced negative emotional expressions in autistic children, while only FSIQ scores to decreased frequency and duration of negative emotional expressions in non-autistic children. Both measures are associated with attenuated increases in unknown emotional expressions in the two groups.

Conclusions:

Using a context that prompts positive emotional expressions offers valuable insights into the emotional expression trajectories of autistic children. Notably, it highlights the persistence of unknown emotional expressions over time and enables the exploration of how cognitive profiles influence emotional patterns.

425.303 Emotional Recognition in Autistic Individuals: A Nuanced Approach

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Background:

Emotional recognition (ER) is an adaptive skill essential for individuals to function socially (Izard et al., 2001). Most studies indicate that autistic individuals have greater difficulty than neurotypical individuals in recognizing emotions, particularly negative and complex emotions (Yeung, 2022; Tang et al., 2019). This difficulty has been linked to a decline in the quality of social interactions in autistic individuals (Lozier et al., 2014). However, as most studies have employed static emotional stimuli (Harms et al., 2010), the extant scientific literature does not indicate whether exposure to a more ecological context, involving dynamic emotional stimuli, would reveal different ER characteristics in autistic individuals.

Objectives:

The aim of this study was to investigate whether there are differences in ER between an autistic and a non-autistic group when exposed to a dynamic task in terms of 1) emotional valence (positive vs negative) and 2) response precision.

Methods:

The Geneva Emotion Recognition Test — Short Version (GERT-S), consisting of 42 video clips, was administered to an autistic group ($n = 30$; Age(Sd) = 35(7); 16M/14F) and a non-autistic group ($n = 55$; Age(Sd) = 30(11); 10M/45F). Participants were asked to indicate which of 14 emotions was expressed by the actor in each video clip (1 to 3 seconds; with visual and auditory cues: face, movement, upper body and prosody). Response accuracy was computed in two ways: 1) exact emotion (i.e., correct response = the target emotion) or 2) similar emotion (i.e., correct response = the target emotion or most similar emotion, e.g. joy and pride; anger and irritation). Group X Valence ANOVAs were conducted on response accuracy.

Results:

The autistic group had significantly lower ER accuracy than the non-autistic group in the exact emotion analysis (means 57 vs 64%; $F(1, 83) = 5.36, p = 0.02$). In contrast, the between-group difference was not significant in the similar emotion analysis ($F(1, 83) = 3.20, p = 0.08$). Positive emotions were better recognised than negative emotions by both groups in the exact emotion analysis ($F(1, 83) = 7.82, p = 0.01$), whereas there was no difference in the similar emotion analysis ($F(1, 83) = 2.37, p = 0.13$).

Conclusions:

The results suggest that autistic individuals have slightly lower ER abilities than their neurotypical counterparts when they must identify the exact emotion conveyed by an actor. However, the similar performance of both groups when considering similar emotions to the target emotion suggests that autistic individuals can recognize broad emotion categories as well as non-autistic individuals. This highlights the importance of exploring different flexible assessment conditions that are better suited the clinical population of autistic individuals. The study is particularly notable for its use of dynamic stimuli, a relatively ecological context, which allows the emotional abilities of autistic individuals to be more accurately reflected.

425.304 Epeekaboo: A Novel Eye-Tracking Paradigm to Track the Development of Contingency Learning and Anticipation

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Background: The social motivation hypothesis of autism asserts that autistic people find social stimuli less rewarding on average (Chevallier et al., 2012; Clements et al., 2018). However, the term “rewarding” encompasses a broad set of processes that are poorly defined, especially in early childhood research. The developmental model of reward processing argues that in the early years, reward processing can be broken down into constituent components of contingency learning, effort, anticipation, response, and others (Clements et al., 2023). Longitudinal study of each component across early childhood will provide a foundation for how the components of reward processing develop typically – and atypically – across a variety of conditions including autism. Thus, we developed a novel experimental paradigm that blends the peekaboo game with the Doors Guessing task in a computerized experiment “ePeekaboo.” ePeekaboo was designed to measure contingency learning and anticipation through anticipatory saccades; future complementary EEG data will integrate response to reward. This project presents the first results of anticipatory saccades to social and nonsocial stimuli.

Objectives: To test whether a novel paradigm elicits measures of anticipation to social and nonsocial stimuli

Methods: ePeekaboo was completed by 30 children ages 3-6 years (Table 1). In ePeekaboo, a social (caregiver) or nonsocial (abstract art) video appears on the screen in the left or right doorway, predicted by one of two auditory cues (Fig 1). We measured anticipation during the 2500ms between the cue and video with four outcomes: A) which doorway (target or non-target) the child looked to first; B) time until first fixation on target doorway; C) number of fixations to target versus nontarget doorway; D) duration of all fixations to target versus nontarget doorway. Fixations were extracted using the dispersion-threshold algorithm for fixation identification (I-DT) from data recorded by a 120Hz Tobii Pro Fusion eye tracker. We applied an angular threshold of 0.5° and a minimum duration threshold of 100ms. For each outcome measure, we compared anticipation during social and nonsocial blocks using Wilcoxon sign-rank tests or paired t-tests when data were normally distributed. Significance was assessed using a Bonferroni-adjusted threshold of $p < 0.0125$.

Results: Participants appeared quicker to fixate on the target doorway during social trials than nonsocial trials ($M(SD)$ social = 527.7(206.0)ms, $M(SD)$ nonsocial = 596.0(472.3)ms), but the difference was not statistically significant ($W = 160.0, p = 0.50$). Similarly, participants fixated on the target doorway first in more social trials than nonsocial trials ($M(SD)$ social = 5.8(3.1), $M(SD)$ nonsocial = 5.3(3.7)), but the result was not significant ($t(29) = 0.54, p = 0.59$). No trends emerged in the number or duration of fixations to the target side (all p 's > 0.01).

Conclusions: Two outcome measures using the novel paradigm ePeekaboo appear promising for assessing anticipation in preschool-age children: time to fixation on target doorway, and number of trials with first fixation to target doorway. Future directions include individual trial analyses to assess contingency learning over trials, behavioral coding of positive affect during response, and integration of Event-Related Potential data to assess neural anticipation and response to reward.



425.305 Estimating Social Responsiveness of Adults with ASD in Group Conversations

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Background: Psychological tests, such as Social Responsiveness Scale (SRS-2), are widely used to screen autism spectrum disorder (ASD). However, conducting psychological tests requires professional skill and knowledge. Aiming to support the screening process, this study proposes machine learning techniques that estimate SRS-2 scores from verbal and nonverbal behaviors captured in video recordings.

Objectives: This study, first, analyzes the correlation between SRS-2 scores and verbal and nonverbal behaviors, such as prosodic features and facial expressions, in video-recorded group conversations. Based on these findings, regression models are proposed to estimate SRS-2 scores using the extracted verbal and nonverbal information.

Methods: Three-person group conversations were recorded, each group comprising one individual with ASD and two neurotypical individuals. A total of 38 participants (11 ASD and 27 neurotypical individuals) participated in the recording sessions, and 22 conversations, each of which was 5-15 minutes long, were collected. SRS-2 self-report scores were collected from all participants. In addition, family-reported SRS-2 scores were collected for ASD individuals. Audio, video, and utterance transcriptions were obtained from the recordings. From these audio, video, and text sources, prosodic features, facial features, and utterance embedding from the RoBERTa language model were extracted as input features for machine learning. To identify useful features for estimating SRS-2 scores, Pearson correlation coefficients were calculated between SRS-2 score and all audio and facial features, and features with statistically significant correlations were identified. Based on the results, regression models, including linear regression and XGBoost, were created to estimate both the overall SRS-2 score and the social communication sub-scale score. **Results:** Correlation analysis found that facial features, such as downward head movements and certain facial expressions (e.g., AU07 and AU04), were significantly correlated with SRS-2 scores. For audio features, speech intensity and some MFCC values were correlated with SRS-2 scores. Several regression models were created by combining different modalities (audio, facial, and language features). The best performing model for overall SRS-2 score estimation was an XGBoost model using language and audio features, with a root mean square error (RMSE) of 21.48. For social communication sub-scale score, the best model was an XGBoost model using the language, facial, and selected audio features that significantly correlated with SRS-2 score, achieving an RMSE of 8.68. It was also found that model performance was better in estimating family-reported SRS-2 scores than self-reported ones for ASD individuals.

Conclusions: This study proposed regression models to estimate SRS-2 scores from multimodal data, including audio, facial, and language features extracted from audio and video recordings. The XGBoost model using language and audio features outperformed others. It was found that feature-selection was useful to improve model performance, and family-reported SRS-2 scores were more reliable than self-report scores for ASD individuals.

425.306 Examining Associations between Social Experiences and Loneliness Among Autistic Youth

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Background: Given the elevated rates of loneliness among autistic youth (Grace et al., 2022), it is important to understand which social experiences are associated with loneliness in autistic populations. Prior research examining predictors of loneliness among autistic youth have focused on the amount of time they spent interacting with others and alone (Parenteau et al., 2024). However, it may not just be the amount of time in social interactions and alone that is critical to understanding loneliness, but how the individual feels about their social interaction and solitary experiences (Adams et al., 2024). Experiences in peer groups are also associated with loneliness among autistic youth (Storch et al., 2012) and are thus equally important to consider when understanding loneliness in this group.

Objectives: Examine associations between loneliness, social interaction/solitary experiences (i.e., time spent alone and interacting, feelings about time spent alone and interacting) and peer experiences (i.e., victimization, being ignored, and being included) among autistic youth.

Methods: Autistic youth (N=241) between 15-26 years old (M=18.7) participated in the current study. Via online survey, youth reported their levels of loneliness using the Loneliness in Context Questionnaire for Adults (Weeks & Asher, 2014). Youth indicated the degrees to which they were ignored and included by their peers using the Ostracism Experiences Scale for Adolescence (OESA; Gilman et al., 2012), and the degree to which they were victimized by their peers using the Revised Schwartz Peer Victimization Scale (RSPVS; Schwartz et al., 2002). Furthermore, at 9PM each day for 7 consecutive days, participants were prompted via a smartphone app to report events that occurred within five specific time frames throughout that day (waking to 9AM, 9AM to 12PM, etc.). Youth reported how long they participated in each event and whether they were interacting with others or alone. Summary variables were derived to approximate the average amount of time that participants spent interacting and alone per day. In addition, for the longest lasting activity in each time frame, participants were presented with a list of 3 positive feelings (e.g., happy) and 7 negative feelings (e.g., stressed). Youth rated how strongly they experienced each feeling on a 3-point scale. Summary variables were derived from the ratings to approximate the average weekly positive and negative feelings scores when interacting and when alone. Multiple regressions were conducted to test the associations between each social experience measure and loneliness.

Results: Model estimates are shown in Table 1. Higher levels of being ignored were associated with higher levels of loneliness. Meanwhile, more negative feelings when alone were associated with increased loneliness, and more positive feelings when alone were associated with reduced loneliness. More negative feelings when interacting were also associated with increased loneliness. Neither time spent alone nor time spent interacting with others were significantly associated with loneliness.

Conclusions: Rather than focusing on the amount of time autistic youth spend alone and interacting, it is equally important for future interventions to facilitate positive peer experiences and consider ways to meet youth's needs for interaction and solitude.



425.307 A Computer Vision-Driven Measure of Facial Expression Atypicality in Autism

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Background: For decades, researchers and clinicians have struggled to quantify the atypical profile of facial expressions often associated with autism. Computer vision provides us with new ways to accomplish this goal, with unprecedented precision and granularity. This study examines the coordination of facial movements constituting a smile, in a large transdiagnostic sample engaging in naturalistic social interaction.

Objectives: 1) To identify a signature of facial expression atypicality in autism. 2) To replicate prior findings of diminished smiling behavior in autism and establish the specificity of this finding to autism versus anxiety symptoms.

Methods: 192 participants (93 female; Mean age/SD/range=15.02/1.77/6.22) completed a five-minute “get-to-know-you” conversation with a confederate based on the Contextual Assessment of Social Skills, while both were video-recorded (1280x720 pixels, 60 frames/second). 42 participants carried an Autism diagnosis, 116 carried one or more non-autism psychiatric diagnosis (PSY group; 33 depression, 106 anxiety, 54 ADHD, 29 other), and 34 were neurotypical without psychiatric diagnoses (NT group; see Table 1). Confederates completed the Conversation Rating Scale (CRS), which includes items rating the prototypicality and genuineness of participants’ facial expressions. Videos were analyzed using the program OpenFace, which decomposes expressions into facial action units (AUs), including those corresponding to a smile (AUs 6 and 12) – the predominant facial expression during this type of social interaction. Atypical smiling behavior was operationalized as a diminished correlation (Pearson r) between the two smiling AUs – a metric from our prior work reflecting of the extent to which the primary facial constituents of a smile are coordinated. Analyses followed categorical (group difference) and continuous approaches (multiple regression with the Social Communication Questionnaire [SCQ] and the parent-report Multidimensional Anxiety Scale for Children [MASC-2]).

Results: As predicted, the Autism group showed a diminished correlation between smiling AUs relative to the NT group ($t(74)=3.38, p=0.001$). The PSY group was not significantly different from Autism or NT. However, the Autism group showed diminished correlation relative to the largest diagnostic category within PSY (anxiety disorders; $t(146)=2.38, p=0.019$). Multiple regression analysis (SCQ and MASC-2 predicting AU6/AU12 correlation) followed the same pattern of specificity to autism and not anxiety; autism symptoms (SCQ) were significantly related to the AU correlation ($\beta=-0.007, p<0.001$; see Fig 1.), but anxiety symptoms (MASC-2) were not ($\beta=0.001, p=0.241$). As predicted, the SCQ correlated negatively with overall smile magnitude ($r=-0.31, p<0.01$). AU correlation significantly predicted CRS items related to facial expression naturalness ($r=-0.22, p=0.003$) and emotional expressiveness ($r=0.25, p<0.001$), establishing the real-world validity of the smile AU correlation metric.

Conclusions: The present findings identify a robust, automated behavioral marker of smiling atypicality in autism. By including a transdiagnostic sample and continuous measures of both autism and anxiety, the study established specificity of this effect to autistic characteristics versus anxiety, though future research is needed to fully establish specificity relative to other traits. Future research should focus on ways of characterizing facial movements (besides AU correlations) that may prove more sensitive to expression differences in autism, as well as data collected in other interaction contexts with varying conversational partners.

**425.308** Examining the Social Content of Spontaneous Thought in Autism Spectrum Disorder

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Background: Up to half of our waking lives are spent engaged in spontaneous thoughts, and the content of these thoughts are causally linked to a variety of mental health outcomes (e.g., anxiety, depression, well-being). Content-wise, 70% of our spontaneous thoughts involve thinking about the self and other people. This spontaneous social thought aids in both the processing of social stimuli and preparing for future social interactions, both of which have been linked to increased social success. Whether spontaneous social thought is related to social outcomes in autism spectrum disorder (ASD) – which is characterized by difficulties in social communication and interaction – remains an underexplored question.

Objectives: The aim of this research is to 1) examine whether spontaneous social thought is related to continuous traits of social aloofness, as captured by the Broad Autism Phenotype Questionnaire (BAP-Q) Aloof Subscale, and 2) examine whether there are group differences in the proportion of social vs. non-social spontaneous in autistic compared to non-autistic adults.

Methods: Participants [neurotypical controls (NT) = 117; ASD = 11] sat in front of a blank screen for 30 minutes and were instructed to let their thoughts drift. Every 20-80 seconds, a prompt would ask them to freeze their thoughts, followed by forced-choice question probes that asked if their thought was about 1) themselves, 2) other people, 3) both, or 4) neither (non-social). Participants then completed the Broad Autism Phenotype Questionnaire (BAP-Q) as a measure of social aloofness. Toward Aim 1, we examined whether the proportion of spontaneous social thought (responses indicating that the participant was thinking about other people or both themselves and other people) was correlated to the BAP-Q Aloof subscale. Toward Aim 2, we examined whether there were any differences in the proportion of responses to the four question probes between individuals with a diagnosis of ASD and our NT control sample.

Results: In our sample of NT controls, self-reported continuous traits of social aloofness were not significantly related to the proportion of social thought ($r=-0.12, p=0.21$). In our preliminary sample of autistic individuals, the ASD group reported numerically lower proportions of thought about themselves [ASD: 36.5% (SD=16.0); NT: 42.8% (19.8); $p=0.31$] and numerically higher proportions of non-social thought [ASD: 25.5% (23.5); NT: 17.4% (15.9); $p=0.13$], but these differences were not significant (Figure 1).

Conclusions: Though still preliminary, our results do not convincingly support the idea of different amounts of social thinking in ASD, or in relation to aloofness in the general population. However, our ongoing data collection will provide more convincing evidence for these claims. This work begins to fill a gap in our understanding of inner experience in ASD. Further investigation into similarities and differences into both the amount and nature of inner thought in ASD are warranted.



425.309 Executive Function Challenges: Associations with Social Communication in Autistic Teens

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Background:

Challenges in social communication (SC) are common in autistic youth and predict outcomes such as loneliness, psychopathology, and quality of life. Executive function (EF) challenges are also prevalent in autism and are linked to SC abilities in children. Limited research exists on how EF predicts SC challenges in autistic teenagers. Exploring this relationship could inform interventions that help autistic youth build meaningful relationships at an age when social pressures begin to shift.

Objectives:

This study investigates how parent- and self-reported EF challenges, as measured by the Behavior Rating Inventory of Executive Function (BRIEF-2), predict parent-reported SC, as measured by the Social Communication and Interaction (SCI) index of the Social Responsiveness Scale-2nd Edition (SRS-2), in autistic teenagers. Of the BRIEF-2 indices, we hypothesized that BRI and ERI, but not CRI, would predict SCI.

Methods:

This study included 184 autistic individuals (35% female assigned at birth) ages 14-18 years old ($M=16.1$, $SD=1.19$), with a mean Full-Scale IQ (FSIQ) of 103 (Range=66-141). As part of two larger treatment trials, parents completed the BRIEF-2 and SRS-2. Teens completed the BRIEF-2 self-report. Pearson correlations were used to assess relationships between self- and parent-reported BRIEF-2 and parent-reported SRS-2 scores. Bidirectional stepwise regression models then examined how BRIEF-2 Parent indices differentially predicted SRS-2 SCI beyond age, sex, and FSIQ, using the AIC method of variable selection. After testing associations at the index level, the relationship between prominent BRIEF-2 Parent subdomain scores and SCI scores was assessed to gain a more precise understanding of the specific aspects of EF driving SC challenges. Analyses were then repeated using BRIEF-2 Self and parent-reported SRS-2 SCI to evaluate the consistency of these associations.

Results:

All BRIEF-2 Parent indices (BRI, CRI, ERI) were positively correlated with SCI. Multiple regression was first used to assess the relationship between covariates (age, sex, FSIQ) and SRS-2 SCI; none reached statistical significance ($F=1.20$, $R^2=0.019$, $p=0.31$). Stepwise regression models including covariates followed by variables of interest (parent-reported BRIEF indices) explained 45% of the variance ($F=49.74$, $R^2=0.45$, $p<.001$), revealing that parent-reported ERI ($\beta=0.55$, $p<.001$) and CRI ($\beta=0.17$, $p<.05$), but not BRI, were significant predictors of SCI, with ERI showing the largest effect. Evaluating ERI subdomains, stepwise regressions showed that parent-reported Emotional Control ($\beta=0.14$, $p<.04$) and Shift (flexibility; $\beta=0.56$, $p<.001$) subdomains explained statistically significant variance in SCI ($F=55.63$, $R^2=0.48$, $p<.001$); flexibility was the strongest factor in explaining SCI. Using self-reported EF, ERI scores, but not BRI or CRI, predicted parent-reported SRS-2 SCI scores ($\beta=0.27$, $p<.001$), with flexibility as the only statistically significant subdomain in explaining SCI ($\beta=0.29$, $p<.001$).

Conclusions:

Flexibility is a consistent predictor of SC challenges in autism; findings held true across both self- and parent-reports, increasing the robustness of these results. These findings complement research showing that EF interventions improve social skills in early childhood. Therefore, flexibility may also be a key target for social communication interventions in teens to improve key outcomes like psychopathology and loneliness, while helping autistic teens develop skills for social relationships aligned with their personal goals.



425.310 Exploring Loneliness through Cognitive Profiles: Understanding Executive Function and Mentalizing across Autistic and Non-Autistic Youth

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Background: Difficulties with executive function (EF) and mentalizing are hallmark cognitive features in autism spectrum disorder (ASD). Challenges in these cognitive domains are shown to be related to poor social outcomes. Across EF and mentalizing research in autistic youth, discrepant findings suggest that the heterogeneity of autism symptomatology is a major limiting factor in fully understanding cognition in autism. It is crucial to understand the complex relationship between cognitive traits and loneliness to best support autistic youth's well-being.

Objectives: Characterize the profiles of EF and mentalizing cognitive features in autistic and non-autistic youth. Explore the relationships between these profiles and social loneliness outcomes.

Methods: *Sample:* 163 eligible participants (Autistic $n=57$; Non-Autistic $n=106$) between the ages of 11 and 14 enrolled in this study (Table 1). Study recruitment is ongoing. *Measures:* IQ was estimated using the Kaufman Brief Intelligence Test, Second Edition (KBIT-2). Two executive function domains were measured using the NIH Toolbox Cognitive Battery: Dimensional Change Card Sort (DCCS) Test (flexibility), and Flanker Inhibitory Control Test (inhibition). Mentalizing was captured across two distinct tasks: The first task (STOMP) is a laboratory-developed task in which participants watched an emotionally charged film clip and described what occurred, capturing spontaneous mentalizing. The second mentalizing task, the face task, captured accuracy in labeling complex emotional states from dynamic faces (face-based mentalizing). Loneliness was captured using a modified Children's Loneliness and Social Dissatisfaction Scale. Using tidyLPA to conduct an LPA in R, we generated the estimated number of profiles and model specifications to identify the best solution based on the model fit.

Results: The autistic group reports higher levels of loneliness compared to the non-autistic group (autistic $\bar{x} = 51.31$; non-autistic $\bar{x} = 38.11$; $p < 0.001$). Groups differ significantly on Flanker ($p < 0.001$), percent accuracy on the Face Task ($p < 0.001$), and frequency of mentalizing words ($p < 0.001$), in which the autistic group scored lower than the non-autistic group. As demonstrated in our group's prior work, none of the selected measures of EF and mentalizing domains predict loneliness when we account for group differences. Preliminary LPA results indicate that 5 distinct EF and mentalizing profiles best fit the data (Figure 1). These profiles significantly predicted loneliness ($\beta = -1.80$, $p = 0.03$) controlling for the diagnostic group.

Conclusions: Supporting prior claims, our results indicate that autistic youth experience more feelings of loneliness than their non-autistic peers. Based on our group's previous work suggesting that a profiles approach is best to explore the heterogeneous nature of cognitive skills in autism, these results provide novel evidence that distinct profiles of mentalizing and executive function exist in autistic samples. In interpreting our results, participants fitting Profile #4, with low spontaneous mentalizing, moderate face-based mentalizing, and high executive functioning scores, reported the lowest loneliness rates. Participants fitting Profile #5, who had low executive function and low spontaneous and face mentalizing, reported the greatest rates of loneliness. Future directions include a more robust sample upon completion of study data collection and additional diagnostic exploration of these profiles.



425.311 Exploring Parental Monitoring of Digital Media in Autistic Adolescents and Young Adults: Insights from Factor Analyses
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Background: Parental monitoring is linked to lower engagement in risky behaviors in youth (Dittus et al., 2023). Restrictive monitoring may be associated with problematic internet use in adolescents, while active and deference monitoring show more positive family outcomes (Hernandez et al., 2023). Youth diagnosed with Autism Spectrum Disorders (ASD) use digital media differently than their peers, potentially increasing their risk for adverse outcomes, including cyberbullying and online miscommunication (Gwynette et al., 2018; Phillips & Anderson, 2020). Measurement development is needed to study caregiver monitoring and online experiences in autistic youth effectively.

Objectives: This study explores the factor structure of the Digital Parenting Mediation Attitude Scale (DPMAS; Navarro et al., 2023) adapted for use on adolescents and young adults diagnosed with ASD, and explores age-related differences in parental monitoring of digital media use.

Methods: Data were drawn from an ongoing longitudinal investigation of alcohol and other substance use in adolescents and young adults with ASD ($N = 238$, aged 12-24, 54.2% male, $M = 19.06$ years, $SD = 3.68$). The original DPMAS was adapted to a 35-item self-report Likert scale by removing nine items related to modeling and adding "not applicable" as a response option. Exploratory and Confirmatory Factor Analyses (EFAs and CFAs) were conducted. Iterative modifications included removing items with low factor loadings, allowing items with high residual correlations to covary, and combining highly related factors (Sarmiento & Vera-Costa, 2019; Wider et al., 2023). Factor scores were then analyzed by age group (adolescents ages 12-17 vs. young adults ages 18-24).

Results: Five factors were extracted in the EFA, explaining 75.23% of the variance. Using a split sample approach, CFA resulted in four factors with acceptable model fit indices ($CFI = 0.898$, $TLI = 0.887$, $RMSEA = 0.061$, $SRMR = 0.067$; see Figure 1). Standardized factor loadings ranged from 0.44 to 0.98. Factor scores analysis by age group revealed differences in digital media use patterns (Table 1). Adolescents reported significantly higher "Limits and Monitoring" ($p = .013$), and "Discussions of Online Behavior and Content," although this difference was not statistically significant ($p = .565$). Young adults reported significantly higher "Parent-Youth Interaction in Social Media and Games" ($p = .048$) and "Parent Involvement in Digital Platforms and Activities" ($p = .028$).

Conclusions: Exploratory and confirmatory analyses resulted in 4 factors that describe different aspects of caregiver limit setting, monitoring, and involvement with digital and social media experiences in autistic youth. Age-related differences were identified between adolescents and young adults diagnosed with ASD, indicating that adolescents reported that their parents set more limits and more actively monitor online activity than parents of young adults. These age-related differences in control and guidance mirror the developmental pattern of parental monitoring observed in the general population. Interestingly, young adults with ASD reported higher parent-youth interaction in social media and online games, indicating persistent engagement of parents in media use into young adulthood. This preparatory work lays the foundation for future research and intervention to improve the well-being of youth diagnosed with ASD in the digital age.



425.312 Exploring Social Goal Achievement for Youth with ASD and ADHD: Insights from PEERS for Adolescents

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Background: Both autistic adolescents and adolescents with attention-deficit hyperactivity disorder (ADHD) may experience social challenges leading to peer difficulties (Mikami et. al, 2017). Literature suggests that youth with co-occurring diagnoses of autism and ADHD may have greater treatment needs as compared to youth with a singular diagnosis (Zablotsky et al., 2020; Sprenger et al., 2013). The PEERS® for Adolescents social skills program (Laugeson et al., 2014) has a strong evidence base in promoting positive social outcomes for autistic teens (Zheng et al., 2021). Data has also demonstrated that PEERS® is effective in improving relational skills through standardized questionnaires for adolescents with ADHD with or without autism (Geannopoulos et al., 2024). However, in the wake of the neurodiversity movement, it is essential to center neurodivergent voices and ensure that social skills programming helps youth meet their own unique social goals (Pellicano & den Houting, 2022).

Objectives: Recent research indicates that across a neurodiverse sample of PEERS® participants, teens report significant improvements in satisfaction with their individualized social goals (Fisher et al., 2024). However, less is known regarding the types and achievement of these individualized social goals by diagnosis.

Methods: Participants included 72 adolescents ($M_{age}=14.01$, $SD=1.85$; 59.7% male) who enrolled in PEERS® for Adolescents. Adolescents had diagnoses of ADHD without autism ($n=18$), autism without ADHD ($n=26$), or co-occurring ADHD and autism ($n=28$). Adolescents identified 1-3 social goals, with goals later coded into six different types (i.e., conversational skills, making friends, deepening friendships, conflict resolution, social confidence, and other) with 80% inter-rater reliability. Adolescents ranked their satisfaction with each goal on a 7-point Likert scale from “very dissatisfied” to “very satisfied” the first week of PEERS® (T1), after 8-weeks (T2), and at 16-weeks upon completing the program (T3). Using the goal satisfaction outcome, a repeated measures ANOVA was conducted to test for the presence of an interaction between time and diagnostic group (ADHD, autism, autism+ADHD).

Results: Crosstabulation analysis indicated no differences in the types of social goals endorsed across the three diagnostic groups, $\chi^2(10) = 5.53$, $p = .853$. A repeated measures ANOVA revealed a significant time by diagnostic group interaction, $F(3.3,258)=2.66$, $p=.043$. The nature of this interaction suggested that although all diagnostic groups significantly improved in their ratings of social goal satisfaction, $p's<.001$, the co-occurring autism+ADHD group showed the greatest rate of improvement over the course of PEERS® for Adolescents.

Conclusions: Results provide continued support for the social validity of PEERS® for Adolescents, as participants with varying neurodivergent presentations endorsed progress toward self-identified social goals. Interestingly, despite distinct symptom profiles and associated social challenges (Mikami et al., 2019), adolescents with ADHD, autism, and co-occurring presentations were similarly likely to endorse different goal types. The finding that the co-occurring autism and ADHD group reported greater improvements in goal satisfaction differs from previous research that suggested similar outcomes across these diagnostic groups using standardized measures (Geannopoulos et. al, 2024). This may suggest the presences of qualitative differences in PEERS®program response that are not being fully captured by standardized questionnaires, warranting further investigation.

425.313 Exploring the Associations between Autistic Traits, Alexithymia, Social Competence, and Parent-Child Attachment Among Autistic Children

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Background: Attachment theory emphasizes the critical role of parent-child attachment in non-autistic children's socio-emotional development, though the relationship between parent-child attachment and socio-emotional development is under-studied in autistic children (Groh et al., 2016). Attachment insecurity may be more common among autistic people (Kahane & El Tahir, 2015), and autistic traits are predictive of avoidant attachment (Gallitto & Leth-Steensen., 2015). Attachment insecurity has been linked to higher levels of alexithymia (difficulty interpreting and expressing emotions; (Besharat & Shahidi, 2014) while secure attachment has been associated with better socio-emotional skills, lower alexithymia, and reduced social difficulties (Jin et al., 2022; Takhashi et al., 2013). However, a few studies have reported conflicting or null results (Oskis et al., 2013). Given the higher potential for attachment insecurity in autistic populations, more research is needed to understand its potential impact on socio-emotional functioning.

Objectives: The purpose of this study was to determine the relationship between attachment insecurity, autistic traits, alexithymia, and social competence among autistic children.

Methods: Participants were 56 autistic children (Mean age=10.07, SD=2.06; 33 boys, 23 girls), aged 6-13 years, and their parents participated in this study by completing online questionnaires. Caregivers completed the Autism Spectrum Quotient (AQ; Baron-Cohen et al., 2001) measuring autistic traits, the Children's Alexithymia Measure (CAM; Way et al., 2010) assessing alexithymia traits, the Multidimensional Social Competence Scale (MSCS; Yager & Iarocci, 2013) measuring children's social competence, and the Adolescent Attachment Anxiety & Avoidance Inventory (AAAAI; Moretti & Obsuth, 2009) assessing attachment insecurity. Bivariate correlations and linear regressions were conducted to examine the relationships between AQ, CAM, MSCS, and AAAAI scores.

Results: Correlational analyses demonstrated that alexithymia traits were positively correlated with attachment avoidance ($r(54)=.28, p=.03$) but not attachment anxiety ($r(54)=.14, p=.36$). Linear regressions showed that attachment avoidance accounted for 28% of the variance in alexithymia traits ($F(1,54)=4.61, p<.05$). Autistic traits did not account for any variance in either attachment anxiety or attachment avoidance. Additionally, both attachment anxiety and attachment avoidance did not account for any variance in social competence.

Conclusions: Only attachment avoidance was related to alexithymia traits, suggesting that autistic children with higher attachment avoidance struggle more with emotional awareness and expression. Attachment avoidance has shown strong linkage to emotional suppression and inhibition (Mikulincer & Shaver, 2019). However, attachment style was not related to autistic children's social competence. Contrary to research with autistic adults (Gallitto & Leth-Steensen., 2015), we did not observe a link between autistic traits and insecure attachment. This may be because attachment is more malleable in middle childhood as compared to adulthood (Kobak & Madsen, 2008), and caregivers' increased involvement at this stage may mitigate the impact of autistic traits on attachment. Our findings suggest that the connection between attachment and socio-emotional development may be weaker in autistic children than what is found in non-autistic children (Groh et al., 2016). A limitation of our study is the lack of a non-autistic comparison group to determine if attachment avoidance is also related to alexithymia traits or if this association is unique to autistic children.

425.314 Exploring the Continuum of Autistic-like Traits: Insights from Demographic, Genetic, and Neuroimaging Correlates in the Adolescent Brain Cognitive Development Study

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Background: An increasing number of studies have utilized autistic-like traits in the general population as an outcome measure to gain insight into autism spectrum disorder (ASD), aligning with the dimensional understanding of the condition. However, autistic-like traits have not been well characterized in large child cohorts, particularly regarding its similarities and differences to ASD in terms of demographics, genetics, neuroimaging, and comorbidities.

Objectives: This study aims to explore the demographic, genetic, neuroimaging, and mental health comorbidities associated with autistic-like traits, comparing those with the highest levels of these traits with individuals diagnosed with ASD.

Methods: This study included 9,788 non-ASD children and 182 autistic children aged 9-11 years from the Adolescent Brain Cognitive Development Study. Autistic-like traits were assessed using the short social responsiveness scale (SSRS). Generalized linear mixed-effect models were applied to evaluate the associations of SSRS with a spectrum of demographic, genetic, neuroimaging, and clinical characteristics. We estimated the heritability of SSRS using twin and sibling data.

Results: Our finding revealed that children with higher SSRS exhibited a higher male-to-female ratio. SSRS had a high heritability of 0.52 (95% CI, 0.45 to 0.63), and higher SSRS scores were correlated with increased polygenic risk for ASD ($P < 0.001$). Neuroimaging analyses identified both overlapping and unique neurobiological underpinnings, with sex-specific variations in structural and functional connectivity similar to those observed in ASD. Higher SSRS scores were linked to lower fluid intelligence, more behavioral problems, more sleep problems, and more psychotic-like symptoms.

Conclusions: These findings underscore the continuity and divergence between ASD and autistic-like traits, advocating for a more inclusive understanding of autism within the general population. Our findings emphasize the need for nuanced diagnostic and therapeutic approaches that accommodate the wide spectrum of autistic expressions.

425.315 Exploring the Interplay between Depression and Mentalizing in Autistic Young Adults

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Background:

Difficulties mentalizing (i.e. interpreting others' thoughts and emotions), including more overmentalizing (i.e., over-attributing mental states), undermentalizing (i.e., missing social cues), and nonmentalizing (i.e., relying on non-mental explanations) (Müller et al., 2016) appear more common in autistic relative to non-autistic individuals. Depression has also been linked with mentalizing differences, particularly under-interpretation of others' mental states (Zwick & Wolkenstein, 2017); however, results are inconsistent (Nestor et al., 2023). Nonetheless, limited research has examined how mentalizing abilities relate to the frequent co-occurrence of autism and depression in adults. The use of both implicit (i.e., automatic, flexible cognitive processes) and explicit (i.e. deliberate, reasoned judgments) mentalizing measures has been particularly lacking, though together, they may offer complementary perspectives into both spontaneous and reflective aspects of an individual's social cognition.

Objectives:

To investigate how depressive symptoms relate to overall mentalizing accuracy and specific social-cognitive errors (under-, over-, and non-mentalizing) in autistic young adults. We hypothesized that depressive symptoms would be associated with reduced accuracy overall and greater undermentalizing specifically, as in non-autistic samples (Wolkenstein et al., 2011).

Methods:

Fifty-eight autistic young adults (see Table 1 for characteristics) were recruited from Canada and the US (50% participated in person, 50% online via Zoom). Eligibility criteria included English proficiency, no history of psychotic disorder, and an autism diagnosis (confirmed via clinical documentation and meeting clinical cut-offs per the Autism Diagnostic Observation Schedule-2 [in-person sample] or Ritvo Autism & Asperger Diagnostic Scale [online sample]). Participants completed self-report measures of depression (Patient Health Questionnaire-9; Kroenke, Spitzer, & Williams, 2001), autistic traits (Social Responsiveness Scale-2), and social anxiety (Liebowitz Social Anxiety Scale; Liebowitz, 1987), a video-based measure implicit task (Movie for Assessment of Social Cognition; MASC; Dziobek et al., 2006) and a vignette-based explicit task (Strange Stories Task; Happe, 1994). Five hierarchical linear regressions tested relationships between depressive symptoms and overall MASC and Strange Stories accuracy, and as well as specific MASC errors (undermentalizing, overmentalizing, nonmentalizing errors), covarying for IQ, autistic traits and social anxiety.

Results:

Greater depressive symptoms were associated with more accurate performance on the MASC ($\beta = .302, p = .050, R^2 \text{ change} = .053$) and Strange Stories task ($\beta = .161, p = .008, R^2 = .084$; see Table 2). Analyses of subtype errors showed no significant associations, though higher IQ was significantly associated with fewer errors of all types, and higher autistic traits with more undermentalizing.

Conclusions:

Contrary to our hypothesis, more accurate mentalizing was linked to higher depressive symptoms among autistic young adults. Greater awareness of social cues may increase vulnerability to depression by heightening sensitivity to one's social differences and negative cues (as in non-autistic adults; Bechtoldt & Schneider, 2016; Hunsche & Kerns, under review). Alternatively, successful mentalizing may come at the cost of well-being, as these efforts could stem from feelings of insecurity or camouflaging (Cage et al., 2019; Hull et al., 2021). Our sample's characteristics (eg., above-average IQ, 50% gender-diverse) limit generalizability, highlighting the need for more diverse samples in future research.



425.316 Facial Expressivity in Autistic and Non-Autistic Adults during Mild and Intense Emotional Experiences

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Background: Autistic adults often differ in facial expressivity (Faso et al., 2015; Foster et al., 2024) in ways that can be perceived negatively and misinterpreted by non-autistic people (Sasson et al., 2017; Sheppard et al., 2016). Automated emotion recognition software indicates that autistic and non-autistic adults differ in expressivity across contexts, with non-autistic adults displaying more positive affect, and negative affect in autistic adults relating to less favorable first impressions (Foster et al., 2024). However, no studies have yet examined whether these differences are driven by differences in the experience of emotion rather than the expression of it.

Objectives: To determine whether emotional expressivity differs in autistic and non-autistic adults when experiencing mild and intense emotional events.

Methods: Twenty autistic and twenty non-autistic adults, comparable on age ($M_A = 25.55$, $M_{NA} = 25.85$, $p = .180$), gender ($p = .321$), ethnicity ($p = .143$), and IQ using the WASI-II ($M_A = 114.00$, $M_{NA} = 113.30$, $p = .435$) were video recorded after being coached to re-live mild and intense experiences of happiness, sadness, and anger using an established methodology (Faso et al., 2015). Participants rated how much emotion they experienced during each recounting. Later, the positive, neutral, and negative affect of participants was classified from videos with iMotions software used in previous studies quantifying expressivity in autism (Foster et al., 2024; Trevisan et al., 2016).

Results: A mixed model ANOVA with group as the between-group variable and emotion and intensity as the within-group variables on self-reported scores of experienced emotion found a main effect of emotion ($p < .001$) and intensity ($p < .001$), indicating that participants reported more experienced emotion for sadness than anger, and for strong compared to mild events. However, the main effect of diagnosis was not significant ($p = 0.69$), indicating that autistic and non-autistic participants did not differ in how much emotion they experienced. When videos of these experiences were analyzed with iMotions, there was a significant interaction between intensity, emotion, and diagnosis ($p = .013$). More positive affect was detected in non-autistic faces ($M = 33.89$, $SD = 5.56$) compared to autistic ones ($M = 16.69$, $SD = 5.56$; $p = .035$), and more neutral affect was detected in autistic faces ($M = 74.67$, $SD = 5.34$) compared to non-autistic ones ($M = 54.12$, $SD = 5.34$; $p = .010$) when recounting mild emotional experiences (figures 1-2).

Conclusions: Despite autistic and non-autistic participants not differing in the amount of emotion experienced, iMotions classified more positive affect in non-autistic expressions and more neutral affect in autistic participants in the mild condition, suggesting that autistic and non-autistic people may be more similar in their expression of intense emotion. However, differences emerged in more subtle emotional expressions. Autistic people may not express mild emotion in their faces as prominently as non-autistic people do or do so in ways that are less identifiable to automated software and non-autistic people. Greater positive affect in non-autistic faces relative to autistic faces may relate to positivity biases favoring non-autistic people. We are now collecting non-autistic rater data to determine if raters also have more difficulty identifying mild emotional states of autistic participants. These data will be included at the time of the conference.



425.317 Friendships in a Diverse Group of Autistic Adolescents and Adults: A Mixed-Methods Approach

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Background: Friendships are crucial during adolescence, providing support and social development (Moore et al, 1991). Autistic people may experience differences in communication styles, sensory sensitivities, and social presentation, which can influence peer interactions (Daugherty et al., 2019). Additionally, external factors such as peer attitudes, access to social support, and inclusive environments play a significant role in shaping friendship opportunities (Ridgway et al., 2023). These barriers to friendship may predispose autistic people to an increased risk of loneliness and social isolation (Deckers et al., 2017). Therefore, a better understanding of the interplay of individual, peer, and environmental factors related to autistic friendship is essential.

Objectives: This work sought to better describe the characteristics of friendships in a diverse set of autistic adolescents and adults, as well as potential barriers to these relationships.

Methods:

Study 1: 15 autistic teens from diverse racial and ethnic backgrounds ($M_{age} = 15.2$ years, $SD = 1.7$; 44% Black, 22% White, 17% Asian, 13% more than one race, 17% Hispanic or Latino) participated in interviews and focus groups related to their social experiences. Responses were recorded and transcribed verbatim, with an inductive approach to thematic analysis (Braun and Clarke 2006, 2022) used to identify salient themes in the data.

Study 2: 16 Black and 16 White autistic adults ($M_{age} = 26.3$ years, $SD = 6.9$) participated in an interview about their social experiences. Interviews were recorded, transcribed, and analyzed following a similar procedure to study 1. A quantitative content analysis was also conducted to compare experiences of belonging in Black and White autistic people.

Results:

Study 1: Several themes related to friendship and social interaction were identified. Participants described 1) the characteristics of friendships, including a preference for similar peers, 2) the benefits and challenges associated with friendships, and 3) the barriers they face within broader peer interactions. Overall adolescents reported challenges with peers and high rates of loneliness. They also described the importance of having good friends and being around similar peers to help protect against these negative experiences.

Study 2: The social experiences of autistic adults shared many similarities with those of adolescents, especially when describing preferred characteristics in friends. Participants often experienced sensory barriers in social settings, and felt a pressure to mask their autistic traits to fit in better, contributing to social withdrawal. The content analysis suggested that Black autistic adults were more likely to report a lack of community support ($p = .001$), and more likely to form cross-group friendships ($p = .023$) compared to White autistic adults.

Conclusions: These findings suggest that autistic youth and adults may face similar barriers to friendship, and value similar characteristics when forming friendships. The results also highlight the importance of incorporating diverse samples, as certain social experiences may differ as a function of race. By understanding the factors contributing to friendship experiences in diverse groups of autistic people, we can encourage the development of supports that help foster genuine, lasting connections, ultimately improving social connection and well-being in autistic youth as they grow.

425.319 Gender and Autistic Camouflaging: CAT-Q Scores in Transgender, Nonbinary, and Cisgender Autistic Adults

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Background:

Gender diversity and autistic identity commonly coexist. Substantial disparities are encountered by autistic, gender-diverse and transgender individuals in assessment and healthcare. Research has identified disparities in autism diagnosis in subpopulations not represented by the stereotypical autism profile (primarily based on cisgender boys) and is beginning to explore specific autistic experiences in underserved populations. "Camouflaging", or "masking" autistic traits, is one such experience which can contribute to under-identification. The Camouflaging Autistic Traits Questionnaire (CAT-Q) has been used to study subjectively perceived camouflaging differences between predominantly cisgender autistic men and women, and in limited research, has included gender-diverse autistic people on a broad level. Yet, research has not addressed how CAT-Q scores vary among specific gender-diverse and transgender groups.

Objectives:

This study investigates how CAT-Q scores differ among autistic binary transgender men and women, nonbinary individuals, and cisgender men and women as an exploratory step in understanding the applicability of the CAT-Q and potential camouflaging differences in these groups.

Methods:

A total of 900 autistic adults, including transgender and gender-diverse participants (58 transgender men, 51 transgender women, 309 nonbinary individuals, 261 cisgender men, 221 cisgender women), were recruited through Prolific. Participants who reported a professional or self-diagnosis of autism were included in this study. Camouflaging experiences were measured using the CAT-Q. An Analysis of Variance (ANOVA) examined differences in CAT-Q total score among autistic transgender men, transgender women, nonbinary individuals, cisgender men, and cisgender women. A Multivariate Analysis of Variance (MANOVA) examined how the three CAT-Q subscores (compensation, masking and assimilation) differed between these groups.

Results:

Significant differences in CAT-Q total score across groups ($p < 0.001$) were found. Post-hoc comparisons revealed that cisgender autistic men scored significantly lower than cisgender autistic women and nonbinary autistic individuals ($p < 0.001$), and that transgender autistic women scored lower than cisgender autistic women ($p = 0.030$). The MANOVA also showed significant differences in CAT-Q subscores by groups (Wilks' Lambda = 0.915, $F(12, 2362.9) = 6.70$, $p < 0.001$). Post-hoc ANOVAs for each subscore showed that cisgender autistic men scored significantly lower than cisgender autistic women on compensation ($p < 0.001$) and masking ($p = 0.016$). Transgender autistic women scored significantly lower than cisgender autistic women on compensation ($p = 0.030$) and masking ($p = 0.002$). In assimilation, cisgender autistic men scored lower than cisgender autistic women ($p < 0.001$), while nonbinary autistic individuals scored higher than cisgender autistic men ($p < 0.001$).

Conclusions:

CAT-Q scores differed on average between cisgender, binary transgender, and nonbinary autistic adults. While this may indicate camouflaging differences between cisgender, gender-diverse and transgender autistic groups, it may also reflect the yet undetermined measurement invariance of the CAT-Q as a measure across transgender and gender-diverse populations. The unbalanced representation of transgender groups, where binary transgender individuals were proportionally the least represented in the sample, should be taken into account. Future research should focus on validating the CAT-Q in gender-diverse groups, and exploring factors that contribute to differences in CAT-Q scores and camouflaging.

**425.320 Having Older TD Siblings Is Associated with Better Social Functioning in Autistic Children; What about Having Older Autistic Siblings?**

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Background:

Previous research showed that having older, typically developing (TD) siblings is associated with better social functioning in autistic children. Modeling by the older sibling and the fact that siblings provide a social companion to practice social skills were suggested as explanations. This raises the question of what occurs when autistic children have older autistic siblings. In this case, modeling by the sibling might lead to more autistic symptoms, and at the same time, greater companionship might be expected between two autistic siblings under the double empathy problem framework.

Objectives: To investigate whether findings of a positive effect of older TD siblings on the social functioning of autistic children replicate and whether having older autistic siblings is associated with a similar or an opposite pattern.

Methods: The National Autism Database of Israel was used to retrieve collected data for secondary analyses (1,596 autistic children who completed the Autism Diagnostic Observation Scale [ADOS]). After removals according to exclusion criteria (>18 years of age, non-Hebrew speakers, missing data, no diagnosis, not living with biological parents, older non-TD siblings), a cohort of 794 children was scanned to identify autistic children with no siblings (No-Sib; $n=135$), older TD siblings (Older-TD-Sib; $n=261$), and older autistic siblings (Older-Autistic-Sib; $n=27$). Each Older-Autistic-Sib child was matched to 1. Older-TD-Sib, and 2. No-Sib, by sex, age, and cognitive scores, resulting in 25 triads of three matched participants (i.e., 25 participants in each group, see Table 1). The groups were compared on a measure of social functioning (ADOS social effect [SA] sub-domain; A lower score (0-10) indicates less severe social-communication symptoms [better social functioning]).

Results: The effect of group (No-Sib/Older-TD-Sib/Older-Autistic-Sib) on autistic children's social functioning (ADOS-SA) was compared using a repeated measures ANOVA, which indicated a significant difference between at least two groups ($F_{(2, 24)}=3.88, p=.027, \eta^2=.073$). Results from three paired t-tests revealed that autistic children with older TD siblings had better social functioning than autistic children with no siblings ($t_{(24)}=-3.84, p<.001, d=.761$), and no significant difference between the social functioning of autistic children with older autistic siblings compared with autistic children with no siblings ($t_{(24)}=-1.57, p=.129, d=.343$), or with older TD siblings ($t_{(24)}=-1.01, p=.321, d=.294$).

Conclusions: We replicated the finding of a positive effect of having older TD siblings on the social functioning of autistic children. There was no evidence of a significant effect of having an older autistic sibling on either better or worse social functioning of autistic children. However, while autistic children with TD siblings outperformed those with no siblings, they did not outperform those with older autistic siblings. The group of autistic children with autistic siblings demonstrated an "intermediate pattern" between the other two groups. This implies that there could be a positive effect of having an older autistic sibling, albeit smaller, and more statistical power is needed to detect it. This could be explained by complex relationships between sibling modeling and sibling companionship or the impact of parenting measures, such as experience or knowledge. These speculative explanations should be directly examined in future research.



425.321 How Autistic Children Recognize Mask-Wearing and Sunglasses-Wearing Faces: Implications for Face Processing

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Background: Face recognition deficit is a key characteristic of autism. Two kinds of hypotheses have been proposed to explain this phenomenon. One kind of explanation emphasizes the different generalized face processing strategies in autism due to holistic processing deficits (Rose et al, 2006) or local processing bias (Deruelle et al., 2006). Another explanation is the eye avoidance hypothesis (Tanaka & Sung, 2016), which suggests that less attention to the eye region in autism leads to deficits in face recognition. After the COVID-19 pandemic, wearing a mask has become more common. It can also disrupt the holistic processing of faces and make people focus more on the eyes. This may lead to different challenges for face recognition in autism and neurotypical (NT) individuals.

Objectives: This study explored the effects of facial occlusion on recognition abilities and gaze patterns in autistic and NT children using eye-tracking technology, aiming to provide new evidence for the two kinds of hypotheses for face recognition deficits in autism.

Methods: Thirty-one autistic children (age: 5.91 ± 0.80 years) and 29 NT children (age: 5.43 ± 0.81 years) participated in this study. Participants conducted a face recognition task with three blocks using original faces, mask-wearing faces, and sunglasses-wearing faces as stimuli. Each block contained ten trials. During each trial, the target face was displayed for 5 seconds in the familiarization phase. After a random interval of 1-2 seconds, the distractor and target face were presented at the same time with randomized position assignments. Participants chose which face was the target with no time limit. We used a Tobii Pro Fusion eye tracker to record participants' eye movements during the familiarization phase. Statistical analysis was performed using Mann-Whitney U tests, Wilcoxon signed rank tests, linear mixed models (LMM), and generalized linear mixed models (GLMM).

Results: The analysis of behavioral data showed that wearing a mask ($p = .007$) or sunglasses ($p = .034$) significantly reduced only NT children's recognition accuracy. We found no significant group difference in the accuracy of recognizing three types of faces. The analysis of gaze patterns revealed that the eye region's gaze proportion of mask-wearing faces ($p = .017$) and the mouth region's gaze proportion of sunglasses-wearing faces ($p < .001$) were significantly higher than the corresponding region of original faces for all participants. Autistic children's gaze proportion of eye region was significantly lower than NT children ($p = .002$). GLMM analysis showed that autistic children's gaze proportion of the eye region positively predicted their recognition accuracy of mask-wearing faces ($p = .007$), and NT children's gaze proportion of the mouth region positively predicted their recognition accuracy of sunglasses-wearing faces ($p = .039$).

Conclusions: This study found that the disruption of holistic processing caused by facial occlusion did not impair face recognition in autistic children, suggesting different holistic-local processing strategies between autistic and NT children. While autistic children demonstrated eye avoidance, it did not lead to recognition deficits.



425.322 How Do Laypeople Define Social Competence?

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Background: Social competence (SC) is an important aspect of functioning that contributes to social well-being. It is also an area of challenge for many autistic individuals. This complex and dynamic construct has been difficult to define, presenting a challenge for researchers aiming to understand its role in autism and in the social stigma that is commonly experienced by autistic people. Previous work has shown value in consulting lay persons' perspectives on SC to gain insight into whether researchers' conceptualization of SC is comprehensive.

Objectives: The present study aimed to examine whether the layperson's definition of SC is reflected in researchers' definition, as defined by the seven domains of the Multidimensional Social Competence Scale (MSCS): *social motivation, social inferencing, demonstrating empathetic concern, social knowledge, verbal conversation skills, nonverbal sending (communication) skills, and emotion regulation*. To this end, we explored the layperson's understanding of SC through a thematic analysis.

Methods: Undergraduate students (69.9% female; $M_{age} = 18.77$, $SD = 2.04$) provided written responses to report their perception of a socially competent person. These responses were examined using thematic analysis.

Results: Three overarching themes, with respective subthemes, in the layperson's definition of social competence emerged: (1) knowledge of social norms (aware of social norms and adapting behaviour according to social norms), (2) social skills (communication, building relationships, regulating, reading people and environments, and leadership) and (3) personal attributes (empathetic, calming and comfortable presence, general positive traits, non-judgemental and open, not anxious, and extroverted).

Conclusions: The themes in layperson definitions of SC share several similarities with researchers' definitions of the concept, as outlined by the MSCS. However, laypeople often include additional qualities that extend beyond the MSCS's seven established domains, such as leadership skills, a calming presence, openness and strong problem-solving abilities. These additional aspects can create gaps between how researchers measure SC and how the general public perceives it. This discrepancy highlights challenges in accurately assessing SC, especially when studying autism. The results of our research indicate that non-autistic individuals may use certain criteria when judging SC, which could influence the social perception of autistic individuals. This insight is valuable for refining both the assessment of SC and our understanding of social stigma toward autism.

425.323 Hyper-Sensitivity or Ignorance? Evidence from Automatic Encoding of Social Information

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Background: Children with autistic spectrum conditions (ASC) are frequently reported with atypical social cognition, but whether such impairments derive from hypo- or hyper-reactivity is still under debate. Previous studies typically probed task-relevant social and non-social information, which could not effectively distinguish between these two hypotheses. Here we propose that testing the task-irrelevant information can better distinguish between the automaticity and sensitivity in the processing of social information.

Objectives: The current study intended to investigate automatic encoding of social information in children with ASC, and to better verify the underlying mechanism of their atypical social cognition.

Experiment 1-Methods: Analysis included data from 20 children with ASC and 20 IQ- and age-matched typical developing (TD) children. Participants were instructed to memorize the color of mushrooms (non-social condition) or colored faces (social condition), while ignoring their orientation (irrelevant non-social feature) or identity (irrelevant social feature), and quickly decide whether the colors changed on the probe display. In half of the trials, the irrelevant feature changed between the memory display and probe display. If irrelevant feature is automatically encoded into working memory, its change would make participants response more slowly according to the previous studies (i.e., the irrelevant distracting effect). By comparing the irrelevant distracting effect between different groups, we could index their processing of task-irrelevant social and non-social features.

Experiment 1-Results: For non-social stimuli, both TD and ASC group responded significantly slower when irrelevant feature changed (TD: $t(19)=3.909$, $p<0.001$, Cohen's $d=0.874$, 95% CI [0.348, 1.384]; ASC: $t(19)=4.313$, $p<0.001$, Cohen's $d=0.965$, 95% CI [0.422, 1.49]), and the distracting effects were comparable between groups ($F(1,38)=1.681$, $p=0.203$, partial $\eta^2=0.031$), while for social stimuli, such effects were observed only in TD group (TD: $t(19)=3.237$, $p=.004$, Cohen's $d=0.724$, 95% CI [0.222, 1.211]; ASC: $t(19)=-0.68$, $p=.505$, Cohen's $d=-0.152$, 95% CI [-0.591, 0.291]; interaction: $F(1,38)=5.387$, $p=.026$, partial $\eta^2=0.124$). This pattern was further confirmed by three-way interaction ($F(1,38)=8.831$, $p=.009$, partial $\eta^2=0.189$).

Experiment 2-Methods: Experiment 2 was designed to test whether children with ASC would automatically encode social feature into working memory and quickly suppress it, so we decreased the display time to 250ms so that they do not have enough time to suppress the social information. Considering the ability of children, we decreased the memory item to one at the same time. Additionally, only social condition was retained because the result of Experiment 1 showed that both groups can encode non-social information into working memory automatically.

Experiment 2-Results: Both TD and ASC group responded significantly slower when irrelevant feature changed (TD: $t(19)=2.35$, $p=.029$, Cohen's $d=0.527$, 95% CI [0.052, 0.990]; ASC: $t(19)=2.03$, $p=.057$, Cohen's $d=0.454$, 95% CI [-0.012, 0.910]), and the distracting effects were comparable between groups ($F(1,38)=0.047$, $p=.83$, partial $\eta^2=0.001$).

Conclusions: The results showed that children with ASC automatically encode task-irrelevant social information at early processing stage, while they could further exclude it at late stage, indicating that atypical processing of social information in children with ASC cannot be simply explained by hypo-sensitivity hypothesis, but rather supporting the hyper-sensitivity with instant suppression.



425.324 Identifying Social Profiles in Autism: Cluster Analysis Using the Multidimensional Social Competence Scale (MSCS)

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Background: Social competence can vary widely, particularly among autistic individuals. This complex social construct is thought to be comprised of seven domains, as defined by the Multidimensional Social Competence Scale (MSCS): *social motivation, social inferencing, demonstrating empathetic concern, social knowledge, verbal conversation skills, nonverbal sending (communication) skills, and emotion regulation*. While previous research reveals general challenges in social competence among autistic individuals, not all autistic people have the same social challenges. Similarly, there are social competency strengths in certain individuals that have not been recognized such as empathic concern.

Objectives: This study sought to identify subtypes of social competence among autistic individuals using the MSCS, as well as whether executive functioning and IQ vary across these subtypes.

Methods: Participants completed the MSCS online or in-person. Data from children and adolescents was obtained through the parent-version of the MSCS, where parents provided responses regarding their child or adolescent.

Results: We conducted exploratory k-means cluster analyses across three samples (autistic children ($n = 268$, $M_{age} = 8.61$, $SD = 1.32$, range: 5.98 – 10.98), adolescents ($n = 148$, $M_{age} = 12.80$, $SD = 1.70$, range: 11.00 – 17.28), and adults ($n = 433$, $M_{age} = 29.91$, $SD = 9.96$, range: 18.00 – 67.00). Across all three samples, a four-cluster solution had the best explanatory power. These solutions gave rise to the following subtypes: (1) socially adaptive (i.e., high scores across all social competence domains), (2) global social difficulty (i.e., low scores across all domains), (3) verbal-emotional strengths (i.e., high scores in verbal communication and emotion regulation), and (4) empathetic and motivated-nonverbal communicators (i.e., high scores in social motivation, empathetic concern, and non-verbal communication skills). Preliminary data were examined to identify differences in executive functioning (child $n = 95$, adolescent $n = 48$, adult $n = 73$) and IQ (child $n = 201$, adolescent $n = 104$, adult $n = 26$) across the four subtypes. Results revealed no significant differences among children, adolescents, nor adults in IQ across the subtypes. However, children in subtypes 1 and 3 exhibited significantly greater executive functioning, in comparison to subtypes 2 and 4 (p -values $< .001$). This suggests that the characteristics of subtype 3, such as strong emotion regulation, may help offset the challenges with executive functioning that are often coupled with low social competence. Meanwhile, high scores in social motivation, demonstrating empathetic concern, and nonverbal communications skills, as exhibited in subtype 4, do not appear to preserve executive function in the same way. Additionally, adolescents in subtype 2 had significantly poorer executive functioning than subtypes 1, 3, and 4 (p -values $< .004$) while differences in executive functioning across the subtypes were not significant among adults, suggesting these challenges may be intertwined with development.

Conclusions: These findings have important clinical implications for autistic individuals. By identifying one's social competence subtype, intervention strategies can be tailored to better suit their specific strengths and challenges. Implications of these subtypes on current knowledge of autism will be discussed.

425.325 Identifying Subgroup Differences in Camouflaging and Impression Management across Behavioral, Motivational, Cognitive, and Mental Health Domains

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Background: Camouflaging and impression management (IM) are observed across social and neurodiverse groups. Researchers have documented varied patterns of motivations, cognitive skills, and mental health issues associated with camouflaging in autistic and non-autistic people. It remains unclear whether there are distinct neurodiverse groups who employ and experience IM/camouflaging differently.

Objectives: 1) To identify subgroups in the general population based on IM/camouflaging tendencies; and 2) To characterize subgroup differences across behavioral, motivational, cognitive, mental health and neurodivergent trait domains.

Methods: A total of 972 adults (461 cisgender men, 491 cisgender women, 20 gender-diverse, Mean-age=44.2years, 72.7% Caucasian, 7.51% neurodivergent) completed an online survey assessing IM (i.e., camouflaging, self-presentation, self-concealment, compensation), mental health (i.e., anxiety, depression, self-regulatory fatigue, subjective authenticity), social pressure (i.e., internalized stigma, social anxiety), and neurodivergent traits (i.e., autism and ADHD dimensional traits). Exploratory Factor Analysis (EFA) on the subscale-scores from all IM measures identified latent dimensions, which were then applied as features in a Latent Profile Analysis (LPA) to identify IM subgroups (Figure 1A). Univariate analyses described IM and mental health patterns across subgroups. Multinomial logistic regression examined the associations of demographics, cognitive capacities, social pressure, and neurodivergent traits with subgroup membership.

Results: EFA and item review suggested three latent dimensions within IM: active strategies, defensive strategies, and IM ability. LPA identified three IM subgroups that we termed "Compelled", "Optimal", and "Striving" based on their profile characteristics (Figure 1B). The subgroups differed in IM patterns, neurodivergent traits, and mental health outcomes (Table 1A). The "Compelled" subgroup, characterized by high IM engagement, high social needs, and low cognitive capacity, showed the poorest mental health (73% male, Mean-age=36.3). The "Optimal" subgroup, with better cognitive capacity, balanced IM strategies, and lower social needs, exhibited the best mental health (56% female, Mean-age=53.0). The "Striving" subgroup displayed moderate IM, social needs, and mental health (57% female, Mean-age=40.7). Higher autism traits were associated with lower chances of being in the "Optimal" ($OR = 0.913$, $p < 0.001$) and "Striving" subgroups ($OR = 0.932$, $p < 0.001$) than in the "Compelled" subgroup (Table 2B). Similarly, higher ADHD traits were associated with lower chances of belonging to the "Optimal" group compared to the "Compelled" subgroup ($OR = 0.904$, $p = 0.001$). Higher internalized stigma and social comparison tendencies were linked to a higher likelihood of being in the "Compelled" subgroup, while better emotional regulation and social competence were linked to a lower likelihood.

Conclusions: This study identified three IM/camouflaging subgroups in the general population. The "Compelled" subgroup had the poorest mental health, while the "Optimal" subgroup showed the inverse. Neurodivergence was linked to the "Compelled" group. Meanwhile, better emotional regulation and social competence were linked to the "Optimal" subgroup, suggesting that these capacities may highlight individuals with more effective IM/camouflaging. These findings offer novel insights into potential distinctions in how neurodiverse subgroups of individuals experience and employ IM/camouflaging.



425.326 Social Cognition and Visual Attention in Complex Social Interaction Scenes

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Background:

Effective social interaction depends on our ability to interpret others' thoughts, emotions, and intentions, using verbal and non-verbal cues like facial expressions, eye gaze, and body language. This real-time integration of social cues, known as social cognition or theory of mind (e.g., Tager-Flusberg, 2007), allows us to understand others' mental states. Individuals on the autism spectrum, however, may struggle to process multiple social cues simultaneously. While someone may correctly interpret simple social interactions, difficulties can arise as the number of cues or their complexity increases, revealing potential social cognition challenges. Even within the typical population, variations in theory of mind can lead to differences in how social cues are processed and understood.

Objectives:

This project aims to investigate how autistic traits influence social cognition by examining differences in visual attention to complex social scenes.

Methods:

Participants watched short videos of interactions between four friends and answered questions about the characters' thoughts and feelings (*Movie for the Assessment of Social Cognition*, Bölte, S., Fleck, S., & Dziobek, I., 2014). Eyetracking was performed as participants watched the social movies. Autistic traits were measured through self-report questionnaires.

Results:

Pilot results (N = 15) indicated that the number of autistic traits influenced the participants' performance in the MASC task, where a higher number of traits predicted lower social cognition abilities ($p = 0.018$). Additionally, slower responses regarding the characters' mental states were associated with lower social understanding ($p < 0.001$), suggesting a need for longer deliberation times. Data collection is ongoing, and the final analysis will include eyetracking data to investigate whether differences in social cognition relate to how participants allocate visual attention to social cues.

Conclusions:

Our preliminary findings suggest significant variation in social cognition even within the typical population. The final analysis will include visual attention differences and their implications for understanding how autistic traits influence social cognition.

**442.318 Social and Non-Social Autistic Traits Synergise to Impair Facial Emotion Recognition in Men but Not Women: Why You Should Include Sex/Gender in Your Model**

M. Belmonte¹ and J. H. Ong², (1)The Com DEALL Trust, Bangalore, INDIA, (2)School of Psychology and Clinical Language Sciences, University of Reading, Reading, United Kingdom

Background: Aspects of individual differences in perception, cognition and action throughout the general population can be described in terms of dimensional autistic traits, whose strongly polygenic and multifactorial bases give rise to a continuum of individual variation. Two major domains of autistic traits are superior attention to detail and difficulties in neurotypical social interaction. These non-social and social domains of measured autistic traits interact with each other and with sex to determine how and to what extent social information is gathered from eyes and from other facial regions (<https://doi.org/10.3389/fpsyg.2013.00286>): in men but not women, attention to detail synergises with social difficulty to impair recognition of eyes-only faces, yet also synergises with social prowess to facilitate eyes-only face recognition. Facial masking during the recent COVID-19 pandemic offered an ecologically valid opportunity to test the extent of this effect.

Objectives: Might this interaction of sex with social and non-social dimensional autistic trait domains during face recognition extend also to facial emotion recognition? That is, does autistic-like attention to detail facilitate eyes-only facial emotion recognition in men with intact social function but impair it in men with autistic-like social impairment? And if so, does this impairment encompass only more subtle facial emotions, or all facial emotions, and can it be overcome with practice? We addressed these hypotheses using data from the natural laboratory provided by pandemic facial masking.

Methods: We re-analysed a data set (<https://osf.io/xn3g4/>) of emotion recognition from masked faces, in 302 adults (234 women, 68 men) sampled during the first wave of the COVID-19 pandemic and 250 (208 women, 42 men) sampled during the second wave about ten months later. 10% of each sample self-reported with an autism spectrum condition. 32 were common to both samples. Facial emotion stimuli, masked to the eyes only, were taken from the EU Emotion Stimuli (<https://doi.org/10.3758/s13428-015-0601-4>) in the case of simple emotions, and from the 'Reading the Mind in the Eyes' Test (<https://doi.org/10.1111/1469-7610.00715>) in the case of complex emotions. Augmenting the data set's original analysis (<https://doi.org/10.1177/17470218221135585>), the sample was split by sex and by the separate Autism Spectrum Quotient factors social interaction (AQSoInt) and attention to detail (AQDeT), yielding an overall model in which facial emotion recognition was predicted by sex, AQSoInt, AQDeT, time point in the pandemic, emotion complexity, and the subject's self-rated familiarity with interacting with masked social partners.

Results: A significant AQSoInt x AQDeT x Sex x Emotion complexity x Time interaction for facial emotion recognition replicated our earlier sex-specific findings on facial identity recognition as a function of interacting social and non-social autistic traits, but only for recognition of complex emotions, and only at the beginning of the pandemic when subjects were not yet practised at processing masked faces.

Conclusions: In face perception as in so many other dimensional and categorical aspects of autistic variation, sex and gender matter and should be included in models. Pooling samples across sexes or genders can mask effects that may be specific to a single sex or gender, or even opposite across sex or gender.



426 - Combined Topics III

May 2nd, 2025, 12:30 PM - 1:30 PM - Hall 4A

426.327 fNIRS-Based Markers of Cognitive Improvements Following a Nintendo Exergaming Intervention in Autistic Children – a Pilot Randomized Control Trial*J. M. Tsai¹, J. Corey¹, S. Kathiravan¹, L. Alexander² and A. N. Bhat³, (1)Physical Therapy, University of Delaware, Newark, DE, (2)540 S College Ave, University of Delaware, Newark, DE, (3)Department of Physical Therapy, University of Delaware, Newark, DE***Background:**

Children with Autism Spectrum Disorder (ASD) often display co-occurring challenges with executive functioning (EF) and motor skill performance, which can influence their core social communication challenges and overall functioning. Exergaming is the use of videogaming platforms for motor/exercise training. It is an innovative method to promote whole-body movement / exercise for autistic children. However, few studies have examined behavioral and brain activation-related outcomes following exergaming interventions in autistic children.

Objectives:

To compare behavioral and cortical activation patterns in autistic individuals between the Nintendo exergaming intervention group (NE) and control group (CO) during an fNIRS Flanker task with 2 conditions (congruent and incongruent). To examine the relationship between task performance (i.e., reaction time/RT), other domain measures at baseline, and cortical activation patterns (baseline and intervention-related changes).

Methods:

30 individuals between 5-19 years (M=12.6, SD=3.5, 2 Females) were matched on baseline measures of Social Responsiveness Scale (SRS), Repetitive Behavior Scale-Revised (RBSR), and Vineland Adaptive Behavioral Scale (VABS) and were randomized into NE and CO group. The NE group completed an 8-week Nintendo exergaming intervention while the CO group received treatment as usual. We measured the pre- and post-test EF performance and cortical activation outcomes during the Flanker task of EF using functional near-infrared spectroscopy (ETG-4000, Hitachi Medical System, Inc.). BRIEF parent-report questionnaires were used to measure EF performance in various domains pre- and post-test. fNIRS-based cortical activation data were processed using custom MATLAB codes. 52 channels were divided into 5 ROIs for the left and right hemispheres. A repeated-measures ANOVA was conducted (2 Groups X 2 Conditions X 2 Hemispheres X 5 Regions and 2 Timepoints) with a covariate of VABS adaptive functioning and Age. Significance set at $*p < 0.05$, with FDR corrections.

Results:

NE group showed improved RT post intervention, both in congruent and incongruent conditions, compared to the pretest. NE group decreased in overall bilateral hemispheric cortical activation, post-intervention, compared to the pretest. Older NE participants (>13 years) showed training-related reduction in cortical activation in overall MFG, IFG, STS, and IPL post intervention compared to the pretest, whereas younger participants reduced activation in PCG and IPL only. In addition, at baseline, faster **incongruent RT** correlated with **Lower** R/L MFG, Left IPL, Left PCG activation; better **EF performance via BRIEF** correlated with **higher** Right IPL, PCG but, **lower** Left STS, PCG activation. Intervention-related improvements in EF in Flanker task are associated with greater Right STS and Left PCG activation (posttest vs. pretest); Improved EF on BRIEF is associated with **greater** activation in R/L IFG and **reduced** activation in Right MFG, PCG (posttest vs. pretest).

Conclusions:

Default mode network regions including prefrontal, frontal, inferior parietal and superior temporal regions, seem to capture changes in activation that are associated with Flanker task performance. 8-week Nintendo switch exergaming intervention improved EF performance of autistic individuals, and their EF performance correlated with fNIRS cortical activation. We recommend Nintendo exergaming as a home/community-based intervention to facilitate enjoyable physical activity that has added benefits of improved executive functioning and cortical activation patterns.

426.328 How Do Motor Impairments Help Explain the Variability in Children with ASD?*A. N. Bhat, Department of Physical Therapy, University of Delaware, Newark, DE***Background:**

There is a growing body of literature supporting the presence of motor impairments in children with ASD (Bhat et al., 2022, 2023). Yet, motor issues are missing from the ASD definition. It could be argued that motor issues should be included as an ASD specifier to better recognize, assess and treat motor problems from early on in life.

Objectives:

This study examined the value of an added motor measure, Developmental Coordination Disorder-Questionnaire (DCD-Q) to classify a large autistic sample into high vs. low delay group compared to only using diagnostic measures (Social Communication Questionnaire (SCQ) and the repetitive behavior severity screener called the Repetitive Behaviors Scale – Revised (RBS-R)).

Methods:

The SPARK study dataset (N ASD=13,887) was analyzed using K-Means Clustering to determine different subgroups that emerge by adding the DCD-Q, SCQ, and RBS-R measures, as well as parent-reported current levels of cognitive, functional, and language impairments (i.e., current ASD specifiers).

Results:

While 87% of children matched between the subgroups (high vs. low delay) obtained from the 2 analyses (core vs core+motor measures), 13% of the sample did not match indicating more unique subgroups based on motor delay inclusion. Accuracy of detecting high vs. low delay subgroups was better when the core+motor measures were used vs. core measures alone. Parent-reported functional delays validated the shifts in subgroup assignments using the new motor trends following the 2nd clustering analysis. These findings will be further explained in the poster.

Conclusions:

These results highlight the unique role played by motor measures in better explaining the sub-phenotypic variability of school-age children with ASD. These findings have important implications for utilizing tailored motor assessment and intervention approaches to meet the varying motor needs of autistic children. Specifically, motor measure better characterized children's impairment severity (high vs. low delay) that matched parent reports of functional delays.

426.329 Service Receipt in Children with Autism As a Function of Various Demographic and Child-Related Factors: A SPARK Dataset Analysis.*A. N. Bhat, Department of Physical Therapy, University of Delaware, Newark, DE***Background:**

~85% of children with Autism Spectrum Disorder (ASD) from the SPARK study receive standard interventions such as speech-language (SLT) and occupational (OT) therapies (Bhat, 2020,2021). In contrast, only 32 to 13% of children with ASD received movement therapies such as physical and recreational therapies (PT and RT), respectively (Bhat, 2020). Little is known about how service receipt (SLT, OT, PT, RT, ABA, and Social Skills Interventions) changes as a function of various demographic and child-related/impairment-based factors.

Objectives:

This study examined the differences in service receipt (SLT, OT, PT, RT, ABA, and Social Skills Interventions) in children with ASD as a function of various demographic and child-related factors.

Methods:

13,528 parents of children with ASD ages 5-17 years from a nationwide SPARK study conducted by the Simons foundation completed online surveys to provide a report of their child's social communication / motor difficulties and repetitive behavior rates using the Social Communication Questionnaire (SCQ), Developmental Coordination Disorder-Questionnaire (DCD-Q), and Repetitive Behavior Scales-Revised (RBS-R). Parent-reported language, cognitive, and functional delays were also obtained (no, some, or significant delay). Parents also stated the services received (Yes, No to Speech language therapy=SLT, occupational therapy = OT, physical therapy = PT, Behavioral Therapies = ABA, Social Skill Interventions = SSI, Recreational Therapies = RT, etc.).

Results:

While therapies increased commensurate with domain-specific impairments, (e.g., SLT increased in children with language delays) there continued to be large disparities in PT (37-55%) and RT services (15-19%) compared to OT/SLT (85-92%) indicating clear unmet needs for specific motor services. Additionally, demographic factors such as income and age were significant predictors of multiple service receipts.

Conclusions:

These findings once again highlight the disparities in services received by autistic children and the various demographic and child-related factors that influence service receipt. Factors affecting service receipt will inform service providers and policy makers about recommendations for improving service receipt for autistic individuals.

Poster Session**427 - Autism Community Issues and Experiences II**

May 2nd, 2025, 6:00 PM - 7:00 PM - Hall 4A

427.001 How Growing up with an Autistic Sibling Influences Decisions about Marriage, Parenthood, and Careers*O. F. Ward^{1,2}, R. L. Harmon¹ and T. S. Tomeny¹, (1)Psychology, The University of Alabama, Tuscaloosa, AL, (2)Department of Psychology, The University of Alabama at Birmingham, Birmingham, AL*

Background: Sibling relationships are often the longest-lasting connection in an individual's life (Cicirelli, 2013). The experience of having an autistic sibling has a unique impact on an individual's life, often shaping various aspects of one's life, including familial and social relationships (Moss et al., 2019) and psychological adjustment (Quatrosi et al., 2023). However, less is known about how having an autistic sibling may shape lifelong decisions related to marriage, parenthood, or career choices. Research suggests that adults who have a sibling with a neurodevelopmental disability, including autism, are more likely to remain unmarried or delay marriage compared to age-matched peers (e.g., Hodapp et al., 2017; Howlin et al., 2015). Individuals with a sibling with a disability describe thoughts and fears around parenthood due to concerns their child may have a similar disability to their sibling (Free et al., 2022). Individuals with an autistic sibling also report that their sibling was an influential factor in their career choice (Martins, 2007). Whereas evidence suggests that having an autistic sibling shapes one's personal decisions related to marriage, parenthood, and careers, this area of study remains under investigated. Qualitative exploration may increase understanding of factors non-autistic siblings consider when making lifelong decisions.

Objectives: To explore how growing up with an autistic sibling is perceived to shape lifelong decisions in three key domains: marriage, parenthood, and career choices.

Methods: Data collection for this mixed-methods study is ongoing. The current sample includes 32 adults ($M_{age} = 36.06$, $SD = 10.90$) who were predominantly female (59.4%), white (59.4%), and non-Hispanic (75.0%) with an autistic sibling ($M_{age} = 33.81$, $SD = 14.72$). Non-autistic siblings completed an online survey with closed- and open-ended questions about whether having an autistic sibling influenced their decisions related to marriage, parenthood, and career choices, and if so, to describe why. Whereas preliminary themes are offered here, qualitative data will be further analyzed utilizing thematic analysis to identify patterns in non-autistic siblings' thoughts when making lifelong decisions.

Results: Preliminary analyses revealed that having an autistic sibling did influence decisions related to marriage, parenthood, and career choices for 50% of the sample on at least one of these domains. Specifically, 15.6% of participants reported an influence on decisions related to marriage, 34.4% on parenthood, and 15.6% on career choices. Qualitative responses suggest a complex interplay between lifelong decisions and their experience growing up with an autistic sibling (See Table 1). Responses highlight how growing up with an autistic sibling is perceived to both positively and negatively influence non-autistic adult's lifelong decisions about marriage, parenthood, and careers.

Conclusions: Exploration into life decisions of non-autistic siblings provides a more nuanced understanding of the influence of growing up with an autistic sibling. Non-autistic siblings have been found to have higher levels of stress and depression and lower life satisfaction compared to siblings of individuals with other disabilities (Hodapp & Urbano, 2007; Tomeny et al., 2017). Understanding concerns and considerations of adults with autistic siblings will allow for more targeted support for non-autistic siblings.



427.002 How's Dad?: An Investigation of Support, Stress, and Relationship Satisfaction of Fathers of Autistic Children

J. Brennan and T. E. Davis, Department of Psychology, The University of Alabama, Tuscaloosa, AL

Background: A support network is most effective when support is accessible, tailored to the parent's needs, and reciprocated within the relationship. However, fathers of autistic children report decreased social support, increased parenting stress, and decreased relationship satisfaction. Support reciprocation (the mutual exchange of aid within a relationship) is necessary to develop a support network and each reciprocal exchange of support strengthens the relationship. Difficulties reciprocating support have been identified as a contributor to decreased support, as infrequent reciprocation is associated with increased distress and relationship dissatisfaction. Fathers of autistic children are particularly likely to struggle with support reciprocation due to frequent and high levels of stress and demands associated with caring for their child. Support reciprocation is necessary to consider for this population as it highlights the bandwidth fathers have to contribute to and engage with members of their support network. It can also potentially clarify why fathers may struggle to maintain a support network and frequently report relationship dissatisfaction. However, how, when, and to whom fathers of autistic children reciprocate support is underexamined and poorly understood.

Objectives: The aim of this study is to 1) explore how support reciprocation interacts with support, parenting stress, and relationship satisfaction and 2) identify when support is likely to be reciprocated by fathers of autistic children.

Methods: 39 fathers (aged 25–64 years old; 41% white) of autistic children (aged 5–12 years) completed the Support in Intimate Relationships Scale-Revised, the Modified Inventory of Socially Supportive Behaviors, the Autism Parenting Stress Index, the Burns Relationship Satisfaction Test, and the Autism Impact Measure – Impact Scale via an online survey. Pearson's bivariate correlation coefficient was used to determine the relationships between variables of interest. A series of separate moderation models were examined using the SPSS PROCESS macro.

Results: Support reciprocation positively correlated with parenting stress, $r(37) = .89, p < .001$, child autism symptomology, $r(37) = .64, p < .001$, and instrumental support, $r(37) = .57, p < .001$. Child autism symptomology moderated the relationship between reciprocated support and relationship satisfaction and a conditional effect of reciprocated support at high levels of autism symptomology was found. Parenting stress moderated the relationship between reciprocated support and relationship satisfaction and conditional effects of reciprocated support at mean and high levels of stress were found. Parenting stress and child autism symptomology, respectively, moderated the relationships between instrumental support and support reciprocation.

Conclusions: This study revealed that for fathers of autistic children with high autism symptomology, their relationship satisfaction significantly increased the more they reciprocated support. Their relationship satisfaction also significantly increased across stress levels as their support reciprocation increased. Surprisingly, both 1) fathers with high stress and 2) fathers of autistic children with high autism symptomology reported the greatest support reciprocation across levels of instrumental support. Examining support reciprocation is necessary to better understand how fathers interact with and seek support. A more nuanced understanding of when fathers struggle to reciprocate support can help clinicians identify when and how to intervene to help improve a father's support network, relationship satisfaction, and well-being.

**427.003** Impact of the COVID-19 Pandemic on the Roles and Mental Health of Caregivers of Children with ASD: Experiences of Puerto Rican Mothers.C. Borja¹, K. Lebron-Rojas² and F. Ruiz-Alfaro³; (1)Psychology, University of Puerto Rico, Río Piedras Campus, San Juan, PR, (2)University of Puerto Rico, Río Piedras Campus, San Juan, PR, (3)Psychology, University of Puerto Rico, Río Piedras Campus, San Juan, PR

Background: During the COVID-19 public health crisis, families and caregivers of children with autism spectrum disorder (ASD) faced particular challenges (Bellomo et al., 2020). Adapting to teletherapy and virtual education intensified the difficulties of children with ASD (Dahiya et al., 2021). Studies have addressed these challenges with Spanish-speaking populations in the United States (Baires et al., 2023) and the impact on the children, but further analysis must explore the complex ways in which these effects have impacted caregivers and families of children with ASD living in Puerto Rico, a United States unincorporated territory.

Objectives: This qualitative study explored the experiences of a small group of primary caregivers of children with ASD in Puerto Rico during the COVID-19 pandemic. It focused on how their roles changed, the technological challenges they faced while seeking care for their child, and the emerging social, behavioral, emotional, and economic difficulties.

Methods: Primary caregivers were recruited through social media and flyers that were advertised in ASD centers. Caregivers were selected after an initial eligibility screening was conducted. Nine (9) mothers, who were the primary caregivers of children with ASD living in urban areas of Puerto Rico, were recruited. The children's ASD diagnoses were made through formal evaluations with standardized instruments and clinical observations. Data were collected through virtual semi-structured interviews to elicit how caregivers' roles changed during the pandemic. These interviews were transcribed and coded to identify recurring themes. Informed consent was obtained before the interview. Demographic data is in Table 1.

Results: A thematic qualitative analysis of the interviews revealed key themes in caregivers' experiences regarding diagnosis acceptance, support networks, and parenting challenges. Caregivers reported that COVID-19 disrupted social routines and limited in-person services, which, according to them, had a significant impact on their children's behavioral problems and delayed diagnoses and interventions. The caregivers adapted therapy at home without adequate resources, feeling like "co-therapists." Increased family stress, economic tensions, and job insecurity during the pandemic further strained them. Caregivers also reported feeling overwhelmed by added responsibilities, their children's skill decline due to isolation, and challenges with teletherapy.

A key quote reflecting caregiver overload is: *"I had to be everything: the teacher, the therapist, the psychologist. At first, it was very difficult because he wouldn't cooperate; he had never taken classes at home."*

Conclusions: In Puerto Rican families, the strong involvement of mothers in therapeutic and educational roles reflects cultural values of closeness and protection (Martinez-Torres, 2023). This caregiving approach contrasts with other countries where responsibilities may be more distributed among external caregivers, institutions, or shared between parents. We conclude that the lack of in-person services placed significant burdens on the mothers in our sample, which led to mental health impacts for both them and their children. These findings align with current research (Bellomo et al., 2020; Franz et al., 2022) but also highlight cultural factors specific to the social context of Puerto Rico.



427.004 Internalizing Mental Health Challenges in Transition-Age Autistic Youth*M. J. Crown, S. Krishnan and G. I. Orsmond, Department of Occupational Therapy, Boston University, Boston, MA*

Background: Autistic people experience internalizing challenges, such as anxiety and depression, at higher rates than the general population. Research on parent and youth agreement in the identification of internalizing challenges in autism has been mixed, warranting further examination. Further, little is known about how parent- and youth-reported symptoms correspond with clinical diagnoses of anxiety and depression and how they may change over the transition to adulthood.

Objectives: The objectives of this longitudinal study were to examine: (1) whether internalizing challenges differed between parent- and youth-report for transition-age autistic youth, (2) whether internalizing challenges persisted over the transition years, and (3) whether anxiety and depressive symptoms corresponded to a parent-reported anxiety or depression diagnosis.

Methods: Autistic youth (14-20 yrs) and a parent completed measures of internalizing mental health challenges at an initial time point (T1; $N=55$ parents; $N=56$ youth) and approximately 18 months later (T2; $N=43$ parents; $N=36$ youth). At T1, all youth (73.3% male) were in high school, expected to graduate with a regular high school diploma, and had a parent-reported professional autism diagnosis (Table 1). Parents also reported any co-occurring youth mental health diagnoses. Parents completed the Adult Behavior Checklist (ABCL; for youth ≥ 17 years old) or Child Behavior Checklist (CBCL; for youth < 17 years old). Autistic youth completed the Depression Anxiety Stress Scales-21 Items (DASS) and the Adult Self Report (ASR; ≥ 17 years old) or Youth Self Report (YSR; < 17 years old). To analyze internalizing challenges over time, we used normative T-scores for Internalizing and its subscales: Anxious/Depressed, Withdrawn, and Somatic Complaints of the Achenbach measures (ABCL/CBCL/ASR/YSR). To compare anxiety and depressive symptoms across diagnostic status, we used scaled scores for Depression and Anxiety subscales of the DASS.

Results: Parent and youth ratings on Achenbach measures were moderately correlated at T1 ($r = .35 - .63$; p 's $< .05$) and T2 ($r = .46 - .70$; p 's $< .05$). Two-way repeated measures ANOVAs (Rater X Time) indicated a main effect of rater for Internalizing and Withdrawn T-scores (F 's > 4.67 , p 's $< .05$), with post-hoc Bonferroni pairwise comparisons indicating greater internalizing challenges for parent-report compared to youth-report (Figure 1). No main effect of time or interaction effect was found. Independent samples t-test revealed that youth with a parent-reported anxiety diagnosis (48%) did not have significantly higher T1 DASS anxiety scores compared to those without a diagnosis. Youth with a parent-reported depression diagnosis (27%) had higher DASS depression scores at T1 ($t(50) = -2.578$; $p < .05$) than those without a diagnosis.

Conclusions: Autistic transition-age youth experienced internalizing challenges that persisted over the transition to adulthood. Discrepancies across reporters likely reflect differences in perspective when identifying internalizing challenges – e.g., parents might over-report symptoms or autistic youth might misinterpret their symptoms. Regardless, misalignment between anxiety symptoms and clinical diagnoses suggests potential barriers to accurate measurement and identification of anxiety in this population. A collaborative approach across autistic youth, parents, and providers might yield more accurate identification of internalizing challenges and potential target areas for intervention during the transition to adulthood.

**427.005** Investigating How School-Based Career Guidance Is Provided to Autistic Young People

S. Dexter¹, A. Remington², L. Crane³ and B. Irvine⁴, (1)Centre for Research in Autism and Education, University College London (UCL), London, United Kingdom, (2)UCL Centre for Research in Autism and Education, London, UNITED KINGDOM, (3)University of Birmingham, Birmingham, Birmingham, United Kingdom, (4)Centre for Research in Autism and Education, Centre for Research in Autism and Education (CRAE), UCL Institute of Education, University College L, London, United Kingdom

Background: Careers guidance, also known as careers education, has long been positioned as a tool to improve young people's transition from education to employment. Yet limited research has investigated how careers guidance is provided to autistic young people.

Objectives: The current programme of research aimed to investigate how careers guidance is being provided to autistic young people attending specialist settings (including those with intellectual disabilities) through eliciting the views of school staff and parents/carers.

Methods: The views of staff from specialist settings and parents/carers were gathered using a mixed method design consisting of online surveys and semi-structured interviews. This research adopted a participatory design. Specifically, five autistic young people, aged 17-23 with the lived experience of accessing careers guidance activities (such as work experience and 1:1 careers advice) were involved as collaborators in the research. Their role included supporting the development of survey and interview materials, and reviewing and commenting on initial findings, which informed the data analysis process.

Results: Staff working with autistic young people ($n=103$) completed an online survey, in which they self-reported the careers guidance activities they were providing for their autistic students. Twenty of these staff members then took part in detailed semi-structured interviews about their experience of delivering these careers guidance activities to autistic young people. Quantitative survey results showed that schools are providing a broad range of careers guidance activities, including embedding learning about careers within the curriculum, work experience and 1:1 careers advice for their autistic young people. Interview data was analysed using thematic analysis and showed that staff working with autistic young people were taking a hugely personalised approach to many careers guidance activities they provide, such as 1:1 careers advice and work experience. However, they also discuss how this could be very time consuming and limited by external factors, such as employers' attitudes towards autism.

Parents/carers of autistic young people ($n = 82$) completed an online survey about their experience. Following this, 19 parents/carers took part in follow-up interviews. Preliminary thematic analysis from the qualitative elements of the online survey and interviews showed that while many parents appreciate the careers guidance activities provided to their child and want them to be involved in them; they feel disheartened about the lack of opportunities available to their child when they leave school. Parents/carers also described feeling responsible for knowing what options were available to their child when they leave school, and that that process could be very challenging to navigate, even with school support.

Conclusions: This research is the first evaluation of careers guidance activities provided to autistic young people educated in specialist settings (including those with intellectual disabilities). Our initial findings demonstrate that school staff are working hard to provide personalised careers guidance support for autistic young people. However, despite what schools are doing, parents/carers do not feel there are suitable opportunities available for their autistic young person when they leave school. The final aspect of this research will investigate autistic young people's experience with careers guidance.

427.006 Investigating Neurodevelopmental and Mental Health Features in Parents of Autistic Children in the AIMS Longitudinal European Autism Project (LEAP)

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Background: Previous studies indicate high co-occurrence between neurodevelopmental and psychiatric conditions in autistic people (Simonoff et al., 2008) and their relatives (Bolton et al., 1994, 1998). Parents with autistic traits (also called the broader autism phenotype (BAP)) have been reported to have elevated mental health problems (e.g., stress, depression) (Ingersoll and Hambrick, 2011). The dimensional evaluation of neurodevelopmental and mental health traits in parents is important to establish a holistic view of familial patterns and support needs. These might also contribute to developmental trajectories in autistic probands via genetic or psychosocial mechanisms and can inform service provision by increasing access to personalised support for families. This study examines the characteristics of parents of autistic probands in the Longitudinal European Autism Project (LEAP), a heterogeneous, well-defined sample assessed across six research centres in the UK and Europe.

Objectives: The current study aims to a) describe the frequencies of neurodevelopmental (autism and ADHD) and mental health features (depression and anxiety) in parents of autistic probands, b) explore the occurrence of neurodevelopmental and mental health features in families where one or both parents have these traits, c) investigate the relationship between neurodevelopmental and mental health features in mothers and fathers.

Methods: Parents (289 biological mothers and 188 biological fathers) of autistic probands who took part in LEAP completed self-report questionnaires about autistic traits (Social Responsiveness Scale, Second Edition; SRS-2), ADHD (hyperactivity/impulsivity and inattention; DSM-5 rating scale of ADHD), and mental health features (Beck Anxiety Inventory (BAI) and Beck Depression Inventory–Second Edition (BDI-II)). We assessed the proportion of parents scoring above clinical cut-offs as defined by the original measures. The Pearson correlation coefficient was used to assess strength of associations between neurodevelopmental and mental health features in mothers and fathers.

Results: Firstly, the proportion of parents who scored above cut-off for clinically relevant traits were as follows: SRS-2, 15.21% fathers and 10.38% mothers; ADHD, 3.85% fathers and 3.51% mothers; Anxiety (BAI), 21.93% fathers and 35.07% mothers; and Depression (BDI-II), 15.05% fathers and 22.49% mothers. Across three subgroups (based on scores for autism and ADHD features), more mothers than fathers reported mental health features (Table 1). Secondly, of 159 families with data from both parents, 25 (15.70%) families had both parents, and 52 (32.70%) families had one parent with at least one neurodevelopmental or mental health feature. Thirdly, in mothers and fathers, we found moderate-to-strong positive correlations of autistic traits with ADHD, anxiety and depression (Table 2).

Conclusions: In the LEAP cohort, a large percentage of families had either one or both parents that met threshold for at least one neurodevelopmental or mental health condition; 12.00% of mothers and 16.10% of fathers were neurodivergent. Mental health problems were moderate-to-highly correlated with neurodevelopmental traits in the entire sample, with higher occurrences of mental health problems in mothers compared to fathers. These findings highlight the need to consider parental mental health when examining mechanisms underlying the development of clinical features in autistic probands, and the need to adopt a neurodiversity-affirmative family perspective to offer targeted support.

**427.007** Latino Parents' Perceptions of Bilingualism in Autistic Children: Psychometric Validation of the Bravo Scale

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Background:

Approximately one in four children with autism spectrum disorder (ASD) grows up in a bilingual household (Trelles & Castro, 2019), with 71% of non-English-speaking parents in the U.S. being Spanish-speaking Latinos (Pompa et al., 2017). As both bilingualism and ASD prevalence rise (Lund et al., 2017), it becomes essential to investigate how bilingualism influences language development in autistic children. Despite growing evidence that bilingualism does not delay language development in autistic children (Beauchamp et al., 2020; Gilhuber et al., 2023; Prévost & Tuller, 2022; Siyambalapitiya et al., 2022), misconceptions persist. Current research on parental perceptions of bilingualism within autistic families has been primarily qualitative (Howard et al., 2021), partly due to the lack of validated instruments tailored to this population. Understanding how Latino parents' cultural backgrounds and belief systems shape their views on autism, bilingualism, and language development is vital for creating reliable assessment tools.

Objectives:

This study aims to conduct an exploratory factor analysis to assess the construct validity and reliability of the Bilingualism Reflections: Assessment of Values and Opinions (BRAVO) scale, which measures parental perceptions of bilingualism in Latino families of autistic children.

Methods:

Data were collected via an anonymous REDCap survey, including demographic information, the Child Language Exposure Questionnaire, the Social Communication Questionnaire, and the BRAVO scale. The sample consisted of 102 parents of children aged 6 to 12 years, with 78.4% (n=80) identifying as Hispanic, 64.7% (n=66) born in the U.S., and 54.9% (n=56) having an autistic child. An Exploratory Factor Analysis (EFA) was conducted using Principal Axis Factoring with Varimax rotation after confirming factorability of the correlation matrix (Fabrigar et al., 1999).

Results:

Parallel analysis indicated the retention of three latent factors. After rotation, Factor 1: *General Perceptions of Bilingualism*, explained 54.78% of the variance; Factor 2: *Cultural and Emotional Benefits of Bilingualism*, explained 10.05%; and Factor 3: *Value of Bilingualism in the U.S.*, explained 7.07%. Together, the three factors accounted for 71.86% of the variance. Factor correlations were as follows: Factor 1 and 2 ($r = .42$), Factor 1 and 3 ($r = .67$), and Factor 2 and 3 ($r = .27$), supporting a three-factor model for the BRAVO scale in this sample.

Conclusions:

This study is the first to quantitatively assess parental perceptions of bilingualism in Latino parents of autistic children, contributing to the literature on autism and bilingualism. It offers a validated, psychometrically sound instrument (BRAVO) to measure bilingualism perceptions in both autistic and non-autistic children. By involving the Latino autistic community, this research addresses a gap in representation, advancing both the field of autism and bilingualism research by giving a voice to an often-underrepresented population, which is a significant improvement in current research methods in the field.

427.008 “Stop Yelling at Me”: The Identification of a Constructivist Grounded Theory Framework for Neurodiversity-Affirming Approaches.

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Background: Neurodiversity was first coined by sociologist, Judy Singer in 1998 to reframe neurological diagnoses in a more positive light, emphasising a person's strengths rather than their weaknesses. Neurodiversity can be described as variations in brain function that should be considered a natural and normal part of biodiversity and should be valued, respected and accommodated. Despite a growing prevalence of neurodivergent diagnoses, neurodivergent adults continue to report negative healthcare experiences. Consequently, neurodiversity-affirming approach provides an alternative option to traditional approaches based in the medical model and aims to embrace an individual's unique characteristics and reframe differences as strengths. Early evidence suggests that neurodiversity-affirming approaches have a positive effect on the well-being of neurodivergent individuals. In the workplace and education contexts, there is a growing body of evidence that suggests that education and awareness of neurodivergence is having a positive effect on productivity, communication and sensory regulation for both neurodivergent and neurotypical populations. However, there is limited information on neurodiversity-affirming approaches in healthcare.

Objectives: This study aimed to conceptualise neurodiversity-affirming approaches within healthcare services from the perspectives of neurodivergent adults in Australia.

Methods: A Constructivist Grounded Theory (CGT) approach was used to explore how neurodivergent adults experience healthcare services in Australia. Theoretical sampling was employed to identify participants for this study. A total of 19 neurodivergent adults (female n=14; male n=4; non-binary n=1) identified as autistic (n=8), having attention-deficit/hyperactivity disorder (ADHD; n=5), and/or both (n=6). Participants engaged in semi-structured interviews online via Microsoft Teams. Data were analysed using grounded theory analysis.

Results: The findings of this study developed a CGT framework to guide the delivery of neurodiversity-affirming care to neurodivergent adults. This framework encompasses three themes. The first theme was *finding and partnering with a healthcare professional (HCP) or healthcare service*: finding and partnering with an HCP or healthcare service is important. Improved results occur through informal approaches such as word of mouth. Theme one also outlined aspects such as appointment booking approaches and costs. Theme two, *the partnership environment*, described the importance of receptionists and administration staff on experiences. The importance of the physical environment was important to navigate a healthcare service. Theme three, was *the neurodivergent person-HCP partnership*, described the importance of communication, interaction and knowledge of neurodivergence. The neurodivergent persons journey through healthcare was underpinned by the threads of transparency and clarity, communication, and education and awareness. The framework developed depicts how the themes, subthemes and central threads intertwine and shape the experiences of neurodivergent adults when accessing healthcare services.

Conclusions: The findings suggest that HCPs and healthcare services adopting neurodiversity-affirming approaches such as the CGT framework by would be beneficial. The experience of neurodivergent adults can be improved by transparency and clarity, communication, and education and awareness. The adoption of neurodiversity-affirming approaches would significantly benefit neurodivergent adults, helping to improve engagement and reduce the stress and anxiety associated with accessing and using healthcare services, and ultimately, provide better health outcomes.

427.009 Learning about Autism Diagnosis Among Korean Autistic Adults

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Background: Being informed about an autism diagnosis refers to the process by which an individual becomes aware of their diagnosis, including when, how, and by whom the information is conveyed. Understanding these factors is essential to help individuals positively accept their autism diagnosis and foster self-understanding and empowerment. However, there is a lack of research on how autistic individuals are informed about their diagnosis, particularly in South Korea, where heightened stigma toward autistic people has been observed (Kim et al., 2021).

Objectives: This study aimed to investigate the experiences and perspectives of Korean autistic adults in being informed about their autism diagnosis.

Methods: Survey questions were developed iteratively by interviewing eight autistic adults with a formal autism diagnosis. The survey, consisting of both open- and closed-response questions, was administered to four participants who received a formal autism diagnosis as adults and five participants whose diagnosis was made in childhood and later disclosed to them by parents (Table 1). We present a summary of descriptive statistics about participants' experiences of being informed about autism and their perspectives on how autism should be disclosed and explained.

Results: Participants reported a range of emotions associated with being informed about their diagnosis. Those who received a formal diagnosis as adults (mean age at diagnosis 30.3 years) generally experienced positive emotions, including joy and relief. Participants whose diagnosis was disclosed by parents during childhood (mean age of notification 11.8 years) reported more negative emotions, with confusion and anxiety being the most prevalent. When disclosing the diagnosis, doctors and parents both explained autistic characteristics and associated challenges ($n=8$, 8), and no participants received a strengths-based or neurodiversity-focused explanation ($n=0$, 0%). Factors that helped participants accept their diagnosis included receiving clarity from the diagnosis ($n=3$; 33.3%) and emphasizing that an autism diagnosis is not the individual's fault ($n=2$; 22.2%). Social stigma toward autistic individuals ($n=5$; 55.5%), difficulty accepting the diagnosis ($n=5$; 55.5%), and negative parental attitudes toward autism ($n=3$; 33.3%) were identified as challenges at the time of being informed about the diagnosis. Participants also shared perspectives on how autism should be explained (Table 2). Many felt it would be helpful to explain autism by highlighting that it is okay to have different characteristics ($n=7$, 77.8%) and from a neurodiversity perspective ($n=7$, 55.6%). When discussing the timing of disclosure, participants believed it was beneficial to provide information gradually, allowing for questions and additional support if needed ($n=5$; 55.5%). Following up after being informed about the diagnosis, participants valued opportunities to ask questions, connect with autistic support groups, and receive psychological support (all $n=7$, 77.8%).

Conclusions: Participants emphasized the need for strengths-based explanations and valued follow-up support, such as opportunities to ask questions and access to psychological services. Societal stigma was closely associated with the experiences of being informed about autism diagnosis. We aim to collect more data and develop comprehensive training materials for stakeholders to equip them with tools to communicate diagnosis in a way that fosters acceptance and empowerment for autistic individuals.



427.010 Linguistic Acculturation Moderates the Relationship between Autism Diagnosis and Vaccine Hesitancy in U.S.-Based Latine Families

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Background: Parents of children with autism have higher rates of vaccine hesitancy (VH) towards early childhood vaccines (i.e., concerns that may lead to vaccine delay/refusal) than parents in the general population. This finding holds true among Spanish-speaking Latine caregivers, as we previously observed nearly three times higher rates of VH in the autism group compared to the non-autism group. VH is concerning for public health because it increases risks for vaccine-preventable illnesses, decreases herd immunity from infectious diseases, and drives up healthcare costs. Some studies suggest that different levels of acculturation within Latine families may actually mitigate anti-vaccine attitudes. However, results are inconsistent and differ based on the type of vaccine in question. Further understanding the influence of acculturation on vaccination attitudes is necessary to improve healthcare accessibility and tailor vaccine education strategies for Latine caregivers.

Objectives: To explore how linguistic acculturation impacts the relationship between diagnostic status (autism vs. non-autism) and VH. Given that caregiver values and trust in medical care likely shift with increased cultural adaptation, we expected acculturation levels to consistently moderate diagnosis on VH.

Methods: US-based Latine caregivers ($N = 201$) participated in a Spanish-language survey about early childhood vaccines and autism perspectives; 74 (37%) had children with autism, 127 (63%) had children without autism. The *Parent Attitudes about Childhood Vaccines* (PACV) was used to identify a binary outcome of VH (i.e., yes or no). The *Short Acculturation Scale for Hispanics* (SASH) was used to create a latent variable for acculturation using the caregiver's linguistic preferences. A probit analysis with a two-way interaction effect was conducted using Mplus to examine the combined effect of an autism diagnosis and acculturation level on VH.

Results: A probit analysis was conducted as a preliminary step to interpret the Johnson Neyman (J-N) region of significance plot. Probit results yielded a significant relationship between autism diagnosis and VH ($p = 0.001$). The J-N technique illustrated the moderation effect that a parent's US acculturation level has on autism diagnosis and VH (see Figure 1). The plot showed that the impact of an autism diagnosis on VH varied according to the parent's acculturation—where the effect of an autism diagnosis on VH became more pronounced as acculturation levels decreased. However, increases in the SASH variable (i.e., acculturation) eventually reached a point where acculturation no longer moderated the relationship between diagnosis and VH.

Conclusions: Our findings suggest that lower acculturation levels significantly moderated the relationship between an autism diagnosis and VH. However, greater assimilation with the US dominant culture (integration of the English language) did not have a significant impact on the association between VH and diagnosis. Linguistic preservation, as well as lack of Spanish-language resources, may prevent acceptance of health messages about vaccines in Spanish-speaking Latine families managing autism. Notably, our latent acculturation variable solely included linguistic predictors of acculturation. A more nuanced look at acculturation (e.g., cultural backgrounds of caregivers' social networks) may be helpful in identifying additional factors that contribute to VH among Latine caregivers.



427.011 Making a Mentorship Program Where Autistic College Students Mentor Autistic High School Students Increasingly Participatory

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Background: Autistic people are underemployed regardless of educational attainment.¹ Self-determination, the ability to act as a causal agent in life, supports autistic people's social, educational, and employment success.² While programs for autistic students often focus on self-determination skills, including self-advocacy, they often position them as needing help from non-autistic people rather than leaders. Participatory approaches increase the validity and impact of autism research but require careful planning to avoid inequalities.³⁻⁵

Objectives:

1. Describe the ongoing process of making *Making Mentors* increasingly participatory.
2. Share initial feedback from mentors and mentees.

Methods:

Making Mentors is a program where autistic college students mentor autistic high school students. In Year 1, 11 autistic mentors (one a consultant) from 2 colleges mentored 10 mentees from 2 high schools. Mentors and mentees complete surveys/interviews around the beginning and end of each year. Mentorship started slowly and was often online due to bureaucracy.

Over a month in Summer 1, mentors, mentees, and staff worked 5 hours weekly to revise materials for Year 2. They completed surveys about summer work. In Year 2, *Making Mentors* expanded to 4 high schools, approximately doubling the number of mentors and mentees.

Results:

Surveys after Year 1 revealed that mentees enjoyed "trying something new," learning about "who I was," "neurodivergent artists," and "college," making "a few friends and acquaintances," and completing "a project I wanted to create for years, with people with similar interests."

However, mentees wished "we touched on college life more," noted scheduling conflicts with academic support, critiqued mentors' commitments and program structure. One noted, "I didn't like how it kind of rushed me to grow up."

Mentors enjoyed weekly meetings, coaching, "neurodivergent staff," receptiveness to "critique," "connecting with my community," "having a support system of people who won't judge me," and "making a difference" with "younger autistic folks to...give them a better sense of belonging in society/make them less scared of the future" by providing "what I didn't have in high school-- proof that you can be your autistic self and enjoy college."

However, mentors noted "lack of direction," difficulties connecting online, and time constraints, highlighting the need for more "structure from the administrators," accessibility, and professional development including greater focus on LGBTQIA+, Zoom etiquette, and strategies for addressing "mentee's autism-related questions."

Mentors and mentees expected their summer work to improve Year 2. Mentors noted, "including the group input at the beginning of the summer session to choose the topics made it so I was engaged..." and "my past experience being a mentor really helped me contribute..." A mentee indicated, "my contributions and my voice have left a positive impact on the program."

While mentors suggested more time for topics that need "breathing room," a mentee suggested shortening summer work. Mentors and mentees recommended increasing focus on implementing prior feedback, neurodivergent leadership, intersectionality, and mental health.

Conclusions: Initial findings suggest bidirectional benefits from autistic college students mentoring autistic high school students, particularly community building. Logistical (e.g., matching mentors-mentees) and conceptual (e.g., developing authentic participatory processes) challenges remain apparent.

427.012 Measuring Stress Improvements Following a Mindfulness Course for Parents of Autistic Children

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Background: Parenting a child with autism spectrum disorder (ASD) can be both rewarding and stressful. The stress aspects may arise from added caregiving needs and providing advocacy for their child, making the sometimes stressful job of parenting even more stressful. Mindfulness is growing in popularity as a therapy to manage stress and may be useful to parents, perhaps especially to parents of autistic children.

Objectives: Examine the effects of an 8 week self-guided mindfulness course on stress, quantified using hair cortisol concentration (HCC) levels, for parents of children with and without autism.

Methods: This study was conducted under the framework of a larger study consisting of three unique phases, each of which lasted for at least 8 weeks. Participants were divided into two groups: parents of children with ASD and parents with children with no first-, second-, or third- degree relatives with ASD. At the initiation of each phase, parents had a hair sample taken from the nape of their neck. After completion of all phases, cortisol concentrations were then extracted through high-performance liquid chromatography followed by analysis through enzyme-linked immunosorbent assay (ELISA) techniques. After obtaining HCC levels for both groups, we analyzed differences in HCC measures between groups before and after completion of the mindfulness course.

Results: Results from Phase 1 showed that parents of children with ASD ($n = 19$, $HCC = .83$) had higher stress levels than parents with all NT children ($n = 20$, $HCC = .75$, $p = .3$). Following a mindfulness intervention, cortisol levels between phase 2 and 3 for the ASD group (Phase 2 $n = 26$, Phase 3 $n = 20$) and the NT group (Phase 2 $n = 31$, Phase 3 $n = 26$) showed a significant decrease ($p = .03$). A repeated measures ANOVA showed no significant differences in stress reduction between parents of ASD and NT children, indicating the magnitude of stress reduction was similar for both parents of ASD children and parents of NT children ($p > .05$).

Conclusions: Our results suggest that mindfulness may be a valuable therapy modality in addressing stress in both parents of children with and without autism. It is also interesting to consider parent report of stress as an alternative or adjunct to HCC measures.

427.013 “Unwritten Rules Are Everywhere”: Autistic Adults’ Social Experiences in College and the Workplace
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Background: In nearly every aspect of adult life, strong social skills are an asset. However, difficulties navigating adult social environments are found to be associated with poorer outcomes for autistic adults. This study examines how autistic adults describe their social challenges and interactions within the context of their transition to adulthood through a series of semi-structured interviews.

Objectives: This study examines how autistic adults describe their social challenges and interactions within the context of their transition to adulthood. Specifically, this project is designed to support the development of neuro-affirming social skills interventions and resource materials that help post-secondary school and work organizations provide accommodations, as well as helping autistic adults cope with the difficulties associated with transitioning to adulthood. Therefore, this study asks the following research questions with the lens of understanding and dismantling compensatory behaviors utilized by autistic adults to assimilate into the social world:

1. How do autistic adults describe the social challenges associated with transitioning into adulthood?
2. What are characteristics of their successful professional or social interactions?
3. What structural changes could educational, vocational, or interpersonal social environments make to promote successful social experiences for autistic students, employees, or friends?

Methods: Seventeen autistic adults (ages 18 to 36) were interviewed. Themes related to social interactions in education and the workplace were analyzed. Data analysis was conducted through the theoretical framework of Critical Disability Theory (Hall, 2019). Data analyses followed the guidelines for reflexive thematic analysis proposed by Braun and Clarke (2006), and a systematic coding consensus approach was then employed (Willms et al., 1990).

Results: Participants expressed **Difficulties with Initial Social** Contact leading to isolation and overstimulation in new environments. Participants recalled difficulties creating **Boundaries** through lack of understanding of appropriate workplace decorum and topics, receiving **Bullying** from coworkers, and experiencing **Growth** in their social and professional identities through employment. Participants struggled and embraced **Disclosure** of autistic identity both in college and in the workplace to coworkers and employers, both wishing to be authentic and known by the people around them and afraid of subsequent discrimination and altered perceptions. Lastly, participants provided **Employer Recommendations** on how to best support their autistic employees, including respecting accommodations, providing expectations upfront for workplace etiquette, and embracing alternate pathways for autistic employees’ success.

Conclusions: The experiences shared by the participants in this study will pave the way for understanding and re-centering of research priorities to reflect the desires of the autistic community, to endow emerging autistic adults with tools for success, and to create collegiate and vocational environments with a greater understanding and acceptance of autistic students, workers, and people.

427.014 Mental Health Challenges in Autistic Teens, Lack of Support, and Impact on the Family

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Background: Limited supports and services for mental health conditions in autistic teens leave these teens and their parents struggling to cope.

Objectives: To explore autistic teens’ mental health challenges and the effect these have on teen and family wellbeing.

Methods: Qualitative interviews were conducted with 46 parents of autistic teens, aged 15-17. Material focused on teen mental health was segregated, then analyzed using the constant comparative method.

Results: Four major themes emerged. **(1) Concerns About Anxiety and Mood.** Parents frequently reported that their teen struggled with anxiety. *She gets extremely anxious and will spiral into a panic attack whenever she feels like she’s done something wrong...* Depression was also mentioned, though less often. *He definitely fights depression and anxiety a lot... He keeps a digital journal for me, so I can track how he’s doing.* **(2) Outbursts and Overwhelm.** Emotional challenges could lead to shutting down. *I guess he gets anxiety, he would just plop himself on the floor and would not move... When he was younger, I could still lift him; as he gets older, it’s hard.* Parents also described meltdowns. *When his anger gets to a certain level, he blanks out, and...can’t control his actions.* Helping a teen return to a regulated state could take time and an emotional toll. **(3) Crisis Points.** Sometimes, the teen had hurt others, injured themselves, or threatened suicide. In certain cases, families reported that extreme behavior had begun at puberty. *He got really aggressive and angry, and was smashing things... leaving the house in the middle of the night, and saying he wanted to kill himself.* Change of school placement, police involvement, or inpatient stays could result. *I feel bad for him because he doesn’t mean it... But he’s like a different person when he’s aggressive... I had to call the police one time... and then they took him to the hospital but I wouldn’t let them keep him because I don’t want him committed somewhere.* **(4) Family Challenges.** Families strove to ease their autistic teen’s difficulties but faced their own issues. *We’ve been through many things of him saying he was going to kill himself... I took eight weeks of family leave to stay home with him.* Parents faced major stressors like dealing with a teen’s aggression. *He actually attacked me... I had to call the cops on him, and it was one of the hardest things I ever had to do.* They ruminated about their teen’s wellbeing. *I’m watching his mood and worrying about him getting down on himself because I can handle almost everything else but when he starts to feel bad about himself, I start to panic.*

Conclusions: As autistic children enter the teen years, mental health challenges can escalate, impacting the wellbeing of teens and families alike. Illuminating the lived experience of autistic teens and their parents is a critical step towards advocating for needed person- and family-centered supports. Future research should focus on further characterizing mental health struggles in this population as well as potential solutions.

427.015 Mental Health Interventions for Caregivers of Autistic Children: An Umbrella Review

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Background: Caregivers of autistic children play an important role in supporting and advocating for their child. The time and effort of such support and advocacy, on top of typically-reported parenting stressors, can further contribute to reduced mental health and wellbeing in these caregivers. A number of studies have explored the impact of clinician-delivered mental health interventions for caregivers of autistic children and generally found positive results. However, the studies and types of interventions vary significantly.

Objectives: This umbrella review aims to (1) explore the overall effectiveness of clinician-delivered interventions on mental health and/or wellbeing outcomes in caregivers of autistic children, and (2) evaluate the quality and validity of the systematic reviews that have been undertaken to assess the effectiveness of these interventions.

Methods: The review has been registered on PROSPERO (CRD42024589283). To synthesise the data, between-study heterogeneity will first be assessed in order to inform subsequent meta-analyses of the standardised mean differences between baseline and post-intervention ratings reported for each of the caregiver mental health and wellbeing outcome measures. Publication bias will also be evaluated. For any systematic reviews that report qualitative results, a thematic analysis will be undertaken to provide a descriptive estimate of caregivers' overall mental health and wellbeing before and after receiving the intervention. Sensitivity analyses are planned to assess the robustness of our findings against variations in intervention time and key participant demographics (e.g., child age, parent education level, parent sex). The quality of each systematic review included as part of the umbrella review will be formally assessed using the Risk of Bias in Systematic Reviews (ROBIS) tool.

Results: The review is currently underway with results to be finalised by February 2025. We anticipate approximately 12-15 systematic reviews to be included as part of our study.

Conclusions: It is hoped that these findings will inform the development and refinement of best practice guidelines for the support of autistic children and their caregivers after diagnosis.

427.016 Mindfulness As a Method to Decrease Stress in Parents of Children with Autism Spectrum Disorder

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Background: Autism spectrum disorder (ASD) is a developmental condition characterized by differences in socialization, communication, and repetitive behaviors. Parents of autistic children often experience heightened stress due to increased caregiving demands. Chronic exposure to these stressors increases psychological strain, with research showing that parents of autistic children, particularly mothers, report greater stress than parents of neurotypical (NT) children. Mindfulness practices have been shown to reduce stress for individuals in a variety of life circumstances. Thus, this study examines the impact of mindfulness-based intervention, specifically self-compassion training, on stress reduction in parents of ASD and NT children.

Objectives: This study aims to (1) compare stress levels between parents of children with ASD and NT children, and (2) assess the effectiveness of a mindfulness intervention in reducing stress, as measured by self-report questionnaires, including evaluating if parents of children with ASD benefit more from the intervention.

Methods: 68 mothers (30 parents of ASD children, 38 parents of NT children) participated in the study. Stress levels were assessed through the Parenting Daily Hassles Questionnaire (PDH) and the Parenting Stress Index (PSI). We further evaluated the quality of life and well-being of parents using the Family Quality of Life Questionnaire (FQOL), the Survey on Flourishing (SURF), and the Neff Self-Compassion Questionnaire-Modified (NSCQ). Parents then participated in a mindfulness-based intervention, "The Gift of Self-Compassion," for approximately eight weeks. Pre- and post-intervention scores on the measures were compared using independent t-tests, paired t-tests, and repeated measures ANOVA.

Results: Parents of ASD children reported significantly higher levels of stress (PDH) compared to parents of NT children ($p < 0.01$, Cohen's $d = -1.44$). Parents of NT children reported a significantly higher quality of life (FQOL) compared to ASD parents ($p = 0.01$, Cohen's $d = 0.87$).

Following the intervention, significant improvements were found in self-compassion ($p = 0.01$) and flourishing ($p = 0.03$) for both groups of parents. However, no significant differences were observed in daily hassles (PDH) or parental stress (PSI) scores. Additionally, parents of autistic children did not experience a significantly greater change in scores following the mindfulness practice than parents of NT children.

Conclusions: The findings suggest that parents of autistic children experience higher stress and lower quality of life compared to NT parents. While the mindfulness-based intervention significantly improved self-compassion and flourishing, it did not impact daily hassles or overall parental stress. These results highlight the complexity of stress management and suggest that self-compassion-based mindfulness helps parents of autistic children as well as other parents. Nevertheless, future interventions targeting the specific needs of parents of children with ASD would be most effective in addressing their unique needs.

427.017 Mixed-Neurotype Interactions in Educational Settings and Their Impact on Autistic Students' Mental Health – a Systematic Review of Qualitative Findings

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Background: Within the framework of neurodiversity, social interactions between autistic and neurotypical (NT) individuals are termed “Mixed-Neurotype Interactions” (MiNtI). Considering the continued rise in autism prevalence, and the global trends of inclusion, MiNtI is becoming more common in educational settings. There is a growing body of qualitative research exploring MiNtI and autistic students’ mental health. While qualitative research brings an in-depth and authentic description of experiences, it is, by design, limited in generalizability. A systematic review of this literature could allow for a meta-synthesis of qualitative findings, leading to a broader understanding of MiNtI in educational settings and its impact on autistic students’ mental health.

Objectives: The objective of this review is to synthesize qualitative studies relating to MiNtI in educational settings and autistic students’ mental health from the viewpoints of autistic and NT students, as well as teachers.

Methods: The methodology followed the PRISMA guidelines. We used various combinations of relevant keywords to conduct a search (e.g., *autis**, *teacher*, *student*, *middle/elementary/primary school*, *qualitative*, *inclusion*, *mental health*). This search resulted in 7830 topic-relevant papers, from which papers were excluded if they did not present qualitative findings, were non-peer-reviewed, did not include students/teachers’ perspectives, or referred to MiNtI that did not include autistic students. The final sample included 109 papers describing MiNtI in educational settings from the perspectives of autistic/NT students and teachers (a total of 1847 participants), with references to autistic students’ mental health. The included papers were thematically analyzed. Sub-themes were merged into main themes. Papers were also tested for risk of bias (under PRISMA guidelines): validity was examined by assessing the neutrality of research questions and looking for evidence that deviated from the researchers’ hypothesis (Table 1).

Results: The analysis resulted in four main themes (Figure 1): Main features (loneliness, bullying, friendship), Autistic Identity (camouflaging of autistic traits/behaviors, disclosure of autism diagnosis), Supporting the Interaction (peer interventions, teachers’ scaffolding), and Specific Settings (Physical Education classes, online social interactions). The most prevalent sub-theme was *loneliness*, including self-exclusion by autistic students and shunning by NT students, described as leading to negative mental health outcomes such as depression and self-harm. Camouflaging was also described as leading to adverse mental health outcomes. While perspectives aligned in some themes, discrepancies emerged for others; for example, the definition of “Friendship” differed by perspective. Most of the papers focused on the autistic perspective ($n=72$). Quality assessment indicated a high risk of bias for findings related to friendship, peer interventions, and teachers’ scaffolding.

Conclusions: Both “positive” and “negative” outcomes of MiNtI are recognized from all perspectives. However, themes describing positive outcomes (e.g., friendship) were found to be at a relatively higher risk of bias, while negative themes (e.g., loneliness) were found to be at a relatively lower risk of bias. Findings flag “invisible” outcomes- the experience of *loneliness* and autistic students’ attempts to *camouflage* their autism - as crucial for their mental health. More research is needed on NT students’ perspectives and the impact of online features such as texting and social networks on mixed-neurotype interactions.



427.018 Understanding Autistic Children’s Reports of Social Connectedness

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Background: When measuring the social interactions of autistic children in school settings, most studies prioritize adult reports or observations over or to the exclusion of student self-reports (Losh et al., 2022). Given the double empathy problem (Milton et al., 2022) and consistent with the “nothing about us without us” movement (Kaplan-Khan & Caplan, 2023), it is important to understand autistic students’ self-reports of social connectedness, in order to facilitate their full educational inclusion. It is unfortunate that the field has deemphasized or ignored the perspectives of the youngest autistic children in schools in favor of relational measures that cannot capture internal experience, and this study aims to remedy that exclusion.

Objectives: We examined the self-reported social experiences of young autistic children. We investigated whether and how these early elementary age autistic students’ self-reports of their social connectedness relate to teacher-reported social integration and researcher observations of social behavior in the classroom. We also examined the stability of these three measures of peer interactions over time.

Methods: Participants ($N=18$) were in Kindergarten through second grade and had an autism diagnosis or possible/suspected autism, in a larger study of an autism-focused teacher professional development program (Hamsho et al., 2023). At three time points over a four-month period, teachers were surveyed about the peer social integration of their target student (Social Competence and Behavior Evaluation/SCBE; Skinner et al., 2009), researchers observed student-peer interactions (inCLASS; Downer et al. 2012), and students were interviewed (Loneliness and Social Dissatisfaction Questionnaire/LSOQ; this measure was validated with autistic children by Zeedyk et al., 2016).

Results: Autistic children largely rated themselves as not feeling lonely at school, with 66% reporting that they had lots of friends and 61% reporting that they do not feel alone at school, but teacher and observer reports were less positive. Friedman’s test showed that student-report, teacher-report, and observer scores were stable over time. Kendall’s *tau-b* correlations showed a significant positive correlation between teacher reports of student interaction mean score and inCLASS observer mean of positive peer social interaction domain scores ($\tau_b = .450, p = .012$). Child-reported loneliness was not correlated with either teacher-report social integration ($T=.23, p=.22$) or observed peer communication ($T=.13, p=.49$).

Conclusions: Autistic children consistently reported less loneliness than would be suggested by teacher and researcher observations of their interactions. Relational observation measures are inadequate to capture the internal experience of any person, but are likely to be inherently biased against autistic children, for whom social communication is a core difference from their peers. Autistic individuals have historically been victims of epistemic testimonial injustice (Fricker, 2007) and their voices should be prioritized in assessments of their social behavior. While teachers and observers noted limited peer engagement, neither adult-reported measure correlated with student self-reports. In fact, children felt more socially-connected by their own accounts, suggesting student self-reports must be included in studies that inquire about social connectedness and peer relationships.

427.019 Neurodiversity and Autistic Representation in Children’s Books about Autism

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Background: Children's books about autism have the potential to serve as valuable tools for promoting neurodiversity (Barrio et al., 2021; Venker & Lorang, 2024). They may function as mirrors, allowing autistic children to see themselves, or as windows, allowing non-autistic children to learn about autistic experiences (Bishop, 1990). However, the range of mirrors and windows these books provide is constrained by the diversity of the autistic characters they portray. Some backgrounds and experiences may be less well represented than others (e.g., use of augmentative and alternative communication/AAC), which could limit the effectiveness of children's books about autism for broadly promoting neurodiversity.

Objectives: Our primary objective was to characterize the race/ethnicity, sex/gender, and communication of autistic characters in a representative sample of picture books. Our second (exploratory) objective was to examine representation over time.

Methods: Using a keyword search (e.g., autism + juvenile), we identified all children's picture books about autism in the collections of four capital city libraries in the Midwestern United States. This study included books in English with an autistic main character ($n = 93$). Trained coders identified autistic characters' race/ethnicity, sex/gender, and communication modalities. Binomial tests compared the demographic representation of autistic characters to the U.S. autistic population (Maenner et al., 2023; Rose et al., 2016).

Results: Nineteen autistic characters (20%) were non-human (e.g., zebra, train); thus, race/ethnicity codes were not applied. Of the 74 human characters, four were Asian, Southeast Asian, or Pacific Islander (5%); 13 were Black or African American (18%); three were Hispanic, Latino, or Spanish origin (4%); one was Native American or Alaska Native (1%); and 53 were White (72%). White characters were significantly over-represented, and Hispanic characters were significantly under-represented ($ps < .001$; see Figure 1). Twenty-three of the 93 autistic characters were female (25%), and 70 were male (75%); this proportion did not significantly differ from the U.S. population ($p = .156$). Four characters produced immediate echolalia, and four produced delayed echolalia. Eight autistic characters had to AAC. Diversity increased over time (see Figure 2a, 2b). Six of the eight AAC portrayals were from books published in the last eight years.

Conclusions: There were relatively few non-White autistic characters. Though the proportion of female characters resembled the U.S. autistic population, Depictions of AAC were rare. Most non-speaking characters (86%) were depicted without access to a reliable communication system. In addition to normalizing a lack of access to AAC, this may limit non-speaking characters' agency (i.e., decision-making abilities). Future work will investigate the intersectionality of multiple minority identities. The few autistic characters who were Hispanic, Asian, or Native American were all male. Autistic children, families, and educators will best be served by books with characters whose diverse identities represent the broader autistic population.



427.020 Optimizing Social-Emotional Well-Being of Mothers and Infant Siblings of Children with Autism: An Experimental Examination of Mom & Baby Net

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Background:

Above and beyond the recent advisory on the mental health and well-being of parents in general, mothers of infants, who have sibling with autism, often experience enormous stressors that can lead to maternal depression and reduced resources for enjoyable interactions with their infants. Infants with siblings diagnosed with autism are at high risk for social-communication difficulties. Mom & Baby Net (MBN) is designed to address a crucial gap in accessible parent-mediated interventions with an embedded parental emotional and relational well-being approach, particularly for diverse parents of infants with and at-risk for neurodevelopmental disabilities.

Objectives:

The purpose of this presentation is to showcase a study examining efficacy of the MBN program with culturally diverse mothers and their infants whose siblings were diagnosed with autism. Objectives include providing an overview of the intervention, study approach, results and implications.

Methods:

Following referral from an internationally recognized autism clinic in the Southeast United States, based on an autism diagnosis of a sibling, mother-infant dyads were screened to establish inclusion criteria. Participants included 3 mothers who identified as African American, American Indian, and Latina. Demographic and maternal social-emotional measures were collected to describe the sample.

A multiple-baseline design was used to evaluate efficacy of the MBN program. Participants completed 14 app-based sessions, each consisting of approximately 25 minutes of video-based learning activities. Following each weekly session, mothers participated in a 30-minute coach call with a predoctoral psychology intern with training and experience implementing MBN with high fidelity. Coach calls consisted of co-viewing mother-infant video to facilitate mother reflection on her infant and her use of the positive behavior support strategies. Infant engagement and parent facilitators of infant social engagement were measured using the Indicator of Parent-Child Interaction (IPCI). Data were graphed for visual analysis to assess trends over time. Mother satisfaction was assessed via a rating scale at post-intervention.

Results:

All three mothers demonstrated significant growth in (a) overall positive behavior support of infant social engagement with increases ranging from 42% to 220% and (b) maintaining child's attention with increases ranging from 136% to 440%. All three infants demonstrated significant improvement in aspects of social engagement, including positive social feedback and follow through with increases ranging from 52% to 380%. All mothers reported high levels of stress prior to intervention. At post-assessment mothers reported high intervention satisfaction, particularly the accessibility of the intervention app and the brief, flexible, remote coach support that fit within the lives of these mothers, struggling with complex time and resource demands as the primary caregivers of young children with special needs.

Conclusions:

Use of the MBN program with culturally diverse mothers was found to be both feasible and effective for engaging mothers of infants whose siblings were diagnosed with autism. Digital interventions such as MBN, which infuse parental stress reduction and mood improvement strategies into early parent-mediated approaches, are promising for engaging diverse populations in early intervention, particularly infants at high risk for neurodevelopmental disabilities and mothers at high risk for anxiety and depression.



427.021 Outcomes of Experiencing Interpersonal Violence in Autism: A Mixed Methods Systematic Review and Meta-Analysis

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Background: Autistic people experience disproportionately worsened outcomes relative to the general population regarding employment, relationships, independent living, and mental health. Autistic females and gender minorities experience particularly elevated mental health challenges. Identifying mechanisms which contribute to these challenges has proven challenging; however, emerging evidence implicates the role of high violence prevalence among autistic people, particularly among females and gender minorities.

Objectives: This mixed-methods systematic review and meta-analysis aimed to examine interpersonal violence and associated impacts on individual factors (e.g., autism, behaviour, mental health) and social variables (e.g., support received, service utilisation, poly-victimisation) among autistic populations of diverse gender identities throughout the life course. We also aimed to summarise the applicability of intersectional and minority stress models for violence outcomes in autism.

Methods: We undertook a systematic database search of the following databases: CINAHL, MEDLINE Complete, PsycINFO, EMBASE, SocINDEX, and Web of Science. Study inclusion criteria were peer-reviewed research of various designs (e.g., qualitative, quantitative, mixed-methods) examining physical, sexual, and/or psychological interpersonal violence among autistic participants diverse in gender, age, and support needs. We conducted a random-effects meta-analysis, pooling data from 9 studies including 3,647 autistic participants (66% males, 24.3% females, 7.1% gender minorities, 2.6% other/non-specified), ranging from one to 80 years. Data not included in our quantitative synthesis were included in a narrative review of 57 studies including 13,127 autistic (71% males, 25% females, 2.4% gender minorities, 1.8% other/non-specified) and 24,291 non-autistic participants (49% males, 51% females, 0.1% gender minorities, 0.1% other n/s).

Results: Analyses found experiencing interpersonal violence was associated with increased mental health and behavioural issues, with the strongest effect found for internalising symptoms ($d = 0.66, p < .001$; CI [0.51, 0.80]), followed by suicidality ($d = 0.63, p < .001$; CI [0.44, 0.82]), post-traumatic stress symptomology ($d = 0.41, p < .010$; CI [0.08, 0.73]), lower self-esteem ($d = -0.35, p = .005$; CI [-0.60, -0.11]), and externalising behavioural difficulties ($d = 0.22, p < .005$; CI [0.07, 0.37]). Narrative synthesis found experiencing violence to be associated with a number of long-standing, adverse individual and social outcomes in relation to health (e.g., mental illness, suicidality, self-harm), functioning (e.g., difficulty accessing support, education, employment, or justice, social challenges) from formative development. These issues were noticeably enhanced among females and gender minorities.

Conclusions: Our findings confirm interpersonal violence incurs longstanding and extensive harm among autistic people, whereby autistic identity and female gender heighten susceptibility towards worsened mental health and behavioural difficulties associated with violence from early childhood. Reviewed findings lend support to the notion that violence incurs a range of mental health and behavioural issues, particularly internalising symptoms (e.g., depression, anxiety) and suicidality, exacerbating intra- and interpersonal difficulties that commonly co-occur alongside autism. Findings implicate a concerning lack of adequate safeguard and response strategies targeted towards violence identification, prevention, and response or treatment among autistic people impacted by violence. This was particularly evident among females and gender minorities from early childhood. Findings raise several considerations for practice, policy, and research

**427.022 Parent Experiences Informing Parent-Child Interactions in Preschoolers with ASD**

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Background: Parent-child play represents a critical resource for connection and developmental growth for children with autism spectrum disorder (ASD). However, parents of autistic children may struggle to effectively engage their children during play, demonstrating elevated criticism, questioning, and controlling behaviors (Doussard-Rousevelt et al., 2003; Zlomke et al., 2019). Various factors influence these parenting behaviors, including elevated rates of stress, psychopathology, and reduced coping in this population, such as through experiential avoidance of negative emotions or behaviors in their child (Cheron et al., 2009; Hayes & Watson, 2013). While it is hypothesized that child, parent, and perceptual factors, such as coping, may relate to family functioning, the implications of parent perceptions and experiential avoidance on observed behavior, remain understudied (McCubbin & Patterson, 1983).

Objectives: The aim of the present study was to identify how parents' mental health, stress, and avoidance relate to behaviors during dyadic play interactions with their autistic children. It was hypothesized that parent-child interactions would be lesser in quality when compared to typically developing controls. It was additionally hypothesized that increased parenting stress, depression, and anxiety would relate to worsened parenting skills during parent-child interactions.

Methods: Participants included 15 children with ASD and 23 typically developing (TD) children ages 3-6 and their parents who completed a 5-minute dyadic pretend play task. Play interactions were qualitatively scored across domains of parent, child, and dyadic quality (Vargo et al., 2024). Parents completed questionnaires on child social and behavioral characteristics. Parents also reported their own stress, depression, anxiety, and completed the Parental Acceptance and Action Questionnaire (PAAQ; Cheron et al., 2009) as a measure of avoidance, coping abilities, and controlling parenting behaviors. T-tests directly compared interaction quality scores to those in TD preschool dyads and Pearson's correlations examined relationship between parent and child characteristics and interaction quality.

Results: Dyads in the ASD group showed reduced interaction quality across child, dyad, and total interaction domains in comparison to typically developing dyads (p 's < .001), however, parent domain quality did not significantly differ between groups. Contrary to hypotheses, there were no significant relationships between parenting stress or psychopathology and parent interaction quality within the ASD group. Further, increased PAAQ experiential avoidance and overall PAAQ coping deficits were positively correlated with quality of parenting skills during dyadic interactions ($r = .538$, $p = .047$, and $r = .555$, $p = .039$, respectively).

Conclusions: Results are surprising in suggesting that parental difficulties of reduced coping, controlling behaviors, and in particular, experiential avoidance, may relate to effective parenting behaviors during dyadic play with their child with ASD. These findings may suggest that parents who avoid negativity in parent-child interactions may use alternative strategies, such as redirection or child-led engagement, to maintain effective interactions with their child. Avoidance of negativity may, in turn, be adaptive or act as a buffer against other stressors in promoting more successful parent-child play interactions. This work can inform efforts to enhance parental adaptation and effective parent-child interactions that may contribute to overall family functioning and child socioemotional growth.

427.023 Parent Experiences Post Comprehensive Diagnostic Evaluation for School Age Children and Adolescents Regarding the Diagnostic Process and Accessing Services

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Background: While crucial to begin therapeutic services, the process of obtaining an autism spectrum disorder (ASD) diagnosis has been identified in extant literature as often stressful for parents (Crane, Chester, Goddard, Henry, & Hill, 2016; Makino, Hartman, King, Wong & Penner, 2021). Dissatisfaction with the diagnostic process related to wait times to obtain an evaluation and post diagnostic support has been identified as a barrier to obtaining a diagnosis and services (Siklos & Kerns, 2005). Jashar, et al. (2019) found parents largely left the feedback session without a clear understanding of next steps to obtain services. Extant research examining post diagnostic support are vastly limited to parents of children under the age of five (Makino et al, 2021). A paucity of information exists regarding post diagnostic support for parents of school age children and adolescents at present.

Objectives: To examine the facilitators and barriers as well as lived experiences of parents and children accessing services across therapeutic and educational domains for school-age children and adolescents after a comprehensive diagnostic evaluation for ASD. Three specific questions are addressed: 1) What were parents' experiences before, during, and after the comprehensive evaluation; 2) What were the most helpful recommendations arising from the evaluation process; 3) How easy or difficult was it to access recommendations post evaluation.

Methods: Parents of school-aged children and adolescents who participated in a comprehensive psychological evaluation including cognitive, adaptive, academic, and autism specific measures (e.g., ADOS-2, CARS-2) at an academic medical center were invited to participate. A convergent parallel mixed method design (Teddle, 2007) was employed in order to gather more in-depth information about participants lived experiences. A sample of 60 parents of children diagnosed with ASD per DSM-VTR criteria ages 6 through 17 years of age ($M_{age} = 8.92$; $SD = 11.43$) completed the quantitative survey. A cohort of 15 randomly selected parents individually interviewed using a semi structured approach. Results were analyzed utilizing thematic analysis to address aforementioned questions along with gathering additional information on lived experiences.

Results: Majority of parents report feeling increased stress prior to the evaluation due to extensive wait times and uncertainty regarding the process and eventual outcome. Opportunity to meet with the provider (in person or virtually) prior to evaluation appointment was highly preferred and moderately related to reduced stress. Over 75% of parents report educational navigation recommendations (e.g., assistance with IEP or Section 504 Plan) as highly beneficial while variable results with other recommendations (e.g., social skills training, applied behavior analysis) with regard to access and quality of service. Consistent with extant research, a positive relationship was found with parents of children with comorbidities in addition to ASD (e.g., ADHD) as they reported decreased satisfaction with post evaluation services.

Conclusions: A paucity of information exists regarding post diagnostic support for parents of school age children and adolescents compared to parents of younger children (birth-5). Information gleaned from this study highlights the need for increased post diagnostic support for families to navigate a new autism diagnosis with school age children and adolescents.

427.024 Parent Outcomes of a Mindfulness-Based Intervention for Autistic Adolescents and Their Caregivers

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Background: Parents raising autistic children experience higher levels of stress than those raising typically developing children or children with other disabilities (Bonis, 2016). In recent years, research on mindfulness-based interventions has highlighted positive impacts on child behavior, family functioning, and both parent and child mental health (Hartley et al., 2019). Among parents of autistic children, higher levels of mindfulness and mindful parenting are associated with lower incidence of depressive symptoms and parental stress (Beer et al. 2013, Conner & White, 2014). The current study builds on this body of work by exploring improvements in parent mindfulness and wellbeing following participation in MINDful TIME (Mindfulness-based Intervention for NeuroDiverse Teens: Telehealth Instruction, Mobile-app Enhanced), a novel group-based telehealth intervention for autistic adolescents and their caregivers.

Objectives:

1. Compare changes in parent mindfulness between the treatment (T_x) and delayed treatment control (DTC) groups.
1. Compare changes in parent wellbeing, stress, and quality of life between T_x and DTC.

Methods: Adolescent-parent dyads ($n=42$) were randomly assigned to T_x or DTC. T_x participants ($n=21$) completed an eight-week telehealth mindfulness and habit formation program, while DTC participants ($n=21$) completed an 8-week wait period prior to intervention. Participants completed pre- and post-outcome measures for the 8-week treatment period or 8-week wait period. For the analysis of parent outcomes, we compared change scores on the Five Facet Mindfulness Questionnaire (FFMQ), Stress Index for Parents of Adolescents (SIPA), the World Health Organization- Five Well-Being Index (WHO-5), and the Beach Center Family Quality of Life Scale (FQOL Scale). Analyses controlled for baseline values for the respective outcome variable.

Results: T_x parents reported greater improvements on the FFMQ ($F(1, 36) = 12.79, p = .001, \eta_p^2 = .26$), the WHO-5 ($F(1, 36) = 7.47, p = .01, \eta_p^2 = .17$), and the parenting domain of the FQOL ($F(1, 35) = 1.27, p = .04, \eta_p^2 = .11$) relative to DTC. T_x parents also reported reduced adolescent-parent relationship dysfunction on the SIPA relative to DTC ($F(1, 36) = 6.36, p = .02, \eta_p^2 = .15$). We did not observe significant group differences on the Family FQOL- Family Interaction or Emotional Well-Being Domains or the SIPA Adolescent or Parent Domains (see Table 1).

Conclusions: Findings support the growing body of literature indicating positive effects of mindfulness interventions for parents of autistic children. Further, they extend existing literature by documenting improvements in adolescent-parent relationship functioning. Significant effects were not observed on variables related to other aspects of family functioning (e.g., spousal and sibling relationships), which is unsurprising given the focus of the intervention. Overall, findings suggest that adolescent and caregiver mindfulness training may improve several, but not all, dimensions of parent and family well-being. Future research with a larger sample size is needed to better understand potential benefits of MINDful TIME for parents and families.



427.025 Parent Views on Primary Care Practices for Children with Autism

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Background: Family experiences within primary care settings vary widely, contributing to persistent disparities in autism care. Including parents in autism care systems is critical; parents need to know how to access resources, advocate for services, seek personal support, and promote positive child development. However, parents' perspectives are often excluded from collaborative care conversations in medical and school settings. Improving provider-caregiver relationships is essential, as evidenced by parents' dissatisfaction with communication amongst professionals involved in their children's care (Carbone et al., 2013). Within primary care settings, parents frequently report that primary care providers (PCPs) do not address specific concerns raised about autism (Dababnah et al., 2018; Curtin et al., 2020). Unfortunately, parents also report a lack of involvement and support in children's educational planning at school (Shamash et al., 2022), negatively impacting collaboration between parents and school professionals. Enhancing effective cross-system partnerships between parents, PCPs, and school-based professionals can improve the quality of care for children with autism across settings.

Objectives: The purpose of this study was to explore what cross-setting, collaborative goals parents of autistic children view as important for their pediatric PCPs to address in primary care, as well as parent views on supportive primary-care practices when navigating the complexities of an autism diagnosis.

Methods: A total of 228 parents of autistic children (ages 0 – 21 years) participated in a survey study about family experiences in primary care. Participants were recruited via email, social media, and flyers in North America. Descriptive statistics and response frequencies were computed to explore parent views on PCP practices and perceptions of PCPs to provide health-related and school-related supports. Pearson's correlation coefficient was used to examine relationships between child-related factors and parents' views on specific school-related practices in primary care. **Results:** Results revealed variability in expectations for and perceived ability of PCPs to provide autism-specific and school-related care. For example, 46.1% of parents identified it as "important" or "highly important" for pediatricians to address developmental concerns, while 11.8% of parents did not feel this was important. Additionally, 20 participants (8.8%) said their child's PCP never connected them with supports and services and 33 participants (14.5%) reported their family was never connected with community-based services for their entire family system. Forty-seven parents (20.6%) rated their PCP as "very good" at connecting families to school-based services; however, 62 participants (27.1%) either rated their PCP as "fair" or "poor". Overall, 84 participants (38.2%) felt it important or highly important for pediatricians to address educational concerns. Child-related factors (i.e., current age, age of autism diagnosis, presence of medical and behavioral health comorbidities) were significantly associated with parents' perspectives on the importance of PCP's addressing school or academic concerns.

Conclusions: Parents' perspectives on which practices are important in primary care must be investigated to identify ways to improve cross-system collaboration between schools and primary care settings. Results from the current study may provide the foundation for developing ways to efficiently and effectively foster cross-system collaboration between primary care and schools for autistic children and their families, as well.



427.027 Parental Empowerment Experiences and Needs in the Healthcare System for Parents of Autistic Children in Taiwan: A Mixed-Methods Study.

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Background:

This mixed-methods study explores parental empowerment within healthcare systems for autistic children, recognizing parents' pivotal role in their children's development and well-being. Guided by the transformative paradigm and empowerment theory, the research emphasizes amplifying the community's voice to advocate for accessible resources and system changes that empower families and promote inclusivity.

Objectives:

The study aims to bridge the gap between research and action by equipping parents with advocacy skills and fostering collaboration between parents and service providers for transformative change. Highlighting the importance of support networks, the research seeks to strengthen parents' confidence in seeking help and connect findings to actionable improvements in Taiwan's healthcare system for families with autistic children.

Methods:

A convergent parallel mixed-methods design was employed, collecting qualitative and quantitative data concurrently. Four parents of autistic children (three preschool-aged and one school-aged boys) were recruited. The research was conducted in the social welfare community-based settings. All the parents were mother of the child, aged from 37 to 45. Semi-structured interviews gathered qualitative data on lived experiences with different systems, exploring parental empowerment needs in healthcare. Thematic analysis identified key empowerment themes. Quantitative data, collected using the Family Empowerment Scale (FES), Parenting Sense of Competence Scale (PSOC), and Parenting Stress Index (PSI-4-SF), was summarized through descriptive statistics. Integrating both data sets provides a comprehensive understanding of parental empowerment, identifying patterns and connections.

Results:

At the micro-level, quantitative data indicates high empowerment, with parents confident in managing their child's needs and maintaining family stability. Qualitative findings support this, revealing increased maternal self-efficacy. However, both data sets highlight challenges, as parents report needing more support to foster their child's development and manage personal sacrifices. At the meso-level, quantitative data shows a positive sense of agency in interactions with service providers, aligning with qualitative findings that value collaborative partnerships. Nonetheless, the findings underscore the urgent need for more proactive engagement and guidance from providers due to the fragmented healthcare system. At the macro-level, lower and variable scores on community and policy empowerment reflect qualitative findings on stigma, financial strain, and limited resources. These barriers underscore the need for further research to address macro-level challenges effectively.

Conclusions:

This study highlights the multifaceted nature of parental empowerment in healthcare, revealing both strengths and systemic challenges. The findings emphasize the need for interventions and policies addressing micro, meso, and macro-level needs to foster genuine empowerment and transformative change. Centering parental voices, this research contributes to developing more effective, family-centered healthcare services that enhance the well-being of autistic children.



427.029 Parental Influence on the Development of Autistic Masking

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Background: Masking is conscious or unconscious social adaptation through the suppression of autistic traits to meet mainstream social norms, to the detriment of an autistic individual's mental health (McDonald, 2020; Pearson & Rose, 2023). Little is known about when masking behaviors start and how relationships impact their development.

Objectives: This study looked at the role parents play in the development of masking, if childhood masking predicts adult masking, and if adult romantic and/or sexual relationships influence masking's relationship with mental health.

Methods: 193 autistic adults completed an online survey on childhood/adulthood masking, perceived parental reactions, parental support behaviors, internalized stigma, expectation of rejection, relationship satisfaction, and mental health. Using a cross-sectional design, mediation analysis examined if parental support behaviors mediated perceived parental reactions and childhood masking; a serial mediation looked at internalized stigma and expectation of rejection on childhood/adulthood masking; and finally, if relationship satisfaction mediates adult masking and mental health.

Results: Negative perceived parental reactions and non-supportive behaviors strongly predicted childhood masking ($p < .001$) and indicated a significant full mediation (figure 1). However, supportive behaviors did not ($p > .05$). Childhood masking was a significant predictor of adult masking ($b = t(184) = 15.21, p < .001$), but was not mediated (nor serially mediated) by internalized stigma or expectation of rejection. Replicating previous work, higher adult masking was associated with higher rates of poor mental health ($p = .012$). However, relationship satisfaction did not mediate this relationship.

Conclusions: Results support the hypothesis that parent/caregiver(s) play a significant role in the development of masking, and that masking behaviors begin in childhood persisting through adulthood. Findings suggest early developmental relationships, such as parents, play a greater role than adult relationships in mental health as a result of masking.

**427.030 Parenting Stress, Social Support, and Affiliate Stigma Among Asian and White Parents of Children with Autism in the United States**

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Background: Extensive research has shed light on the elevated parenting stress experienced by parents of children with autism spectrum disorder (ASD). However, existing studies conducted in the United States predominantly featured white parents, thus lacking evidence of the parenting stress and its predictors experienced by racial minority parents raising autistic children. Addressing this gap is essential for advancing our understanding of the determinants of parenting stress theoretically, with a consideration of minority stress. Moreover, this will provide valuable information to guide the development of more tailored and culturally sensitive support programs for parents of children with ASD from diverse racial and cultural backgrounds.

Objectives: The current study aimed to answer the question of what the role of race in parenting stress is and its predictors among Asian and White parents of children with ASD in the United States. Built upon existing literature on parenting stress among families of children with ASD, we hypothesized that Asian parents of children with ASD would experience higher levels of parenting stress, higher affiliate stigma related to ASD, and lower social support. In addition, we raised two research questions to examine the potential differences between two racial groups: 1) Would race moderate the association between social support and parenting stress? 2) Would race moderate the association between affiliate stigma and parenting stress?

Methods: Using an online survey, 129 parents of children with ASD aged between 2-18 years old living across the United States participated in our study. Among them, 76 parents identified themselves as White, and 50 of them identified themselves as Asian. Parents are aged between 23 and 58 years old ($M = 38.83, SD = 6.68$). Regarding parent gender, 77.8% of parents identified as female, 20.6% identified as male, and 1.6% identified as nonbinary/gender expansive. Parents completed questionnaires about their demographics, parenting stress, perceived social support, affiliate stigma, and child behaviors.

Results: We found that Asian parents reported higher parenting stress ($t = 2.13, p = .04$) and higher affiliate stigma ($t = 2.36, p = .02$) than White parents. Yet, no significant difference was found in social support between the two groups ($p > .05$). Furthermore, linear regression models showed that family socioeconomic status, social support, and affiliate stigma were significant predictors of parenting stress. However, race was not a significant predictor after controlling for the covariates. Regarding the research questions, race was not a significant moderator in the association between social support and parenting stress, nor in the association between affiliate stigma and parenting stress.

Conclusions: Consistent with previous literature, the study found higher risks for parenting stress among Asian parents in the United States. Additionally, social support and affiliate stigma are important factors related to higher parenting stress for both Asian and White parents. Given the significantly high levels of affiliate stigma among Asian parents, future studies should examine the mechanisms of stigma and related sociocultural factors. Finally, future studies should continue to explore the determinants of parenting stress using longitudinal designs, particularly among historically underrepresented families raising autistic children.

427.031 Parents of Autistic Individuals and Their Autism Knowledge, Advocacy, Involvement, Awareness of Neurodiversity, and Attitudes Towards Inclusion

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Background: There is limited research on whether and how parents' perspectives on autism, neurodiversity, advocacy, and inclusion may relate to each other. Understanding these perspectives can be beneficial in providing targeted support to parents in need of resources for advocacy and neurodiversity-affirming and inclusive practices.

Objectives: Two research questions were answered. 1. Do parents' experience in special education, race, primary language, education level, employment status, and family household income predict parents' autism knowledge, advocacy, school involvement, neurodiversity awareness, and attitude towards inclusion? 2. How do parents' autism knowledge, advocacy, school involvement, neurodiversity awareness, and attitude towards inclusion relate to one another?

Methods: 174 parents (92 mothers, 79 fathers, and 3 others) of children with and without disability participated in the study. Parents completed an online survey: (1) Family Demographics & Services Form, (2) Advocacy in Parents of Children with Special Needs, (3) Attitude Survey Inclusive Education – Parents, (4) Neurodiversity Attitudes Scale, (5) Autism Stigma Knowledge Questionnaire-2, and (6) Parent and Teacher Involvement Questionnaire. A descriptive statistical analysis, multiple regression, and path analysis were conducted. See Table 1 for descriptive statistics and Fig 1 for theoretical model tested for path analysis.

Results: Having experience in special education ($R^2 = 2.46$, $t = 2.28$, $p = .024$) and higher income ($R^2 = 3.21$, $t = 4.82$, $p < .001$) and education level ($R^2 = 3.09$, $t = 3.03$, $p = .003$) predicted more neurodiversity awareness. Having no experience in special education ($R^2 = -4.97$, $t = -5.77$, $p < .001$) predicted positive attitudes towards inclusion. Being white ($R^2 = 6.14$, $t = 2.57$, $p = .011$) predicted greater advocacy beliefs/actions. Experience in special education ($R^2 = 5.86$, $t = 2.70$, $p = .008$), being white ($R^2 = 4.64$, $t = 2.16$, $p = .033$) and speaking English ($R^2 = -5.74$, $t = -2.09$, $p = .038$) predicted greater school involvement. Experience in special education ($R^2 = 1.99$, $t = 3.13$, $p = .002$) predicted greater autism knowledge. Autism knowledge had positive direct effect on advocacy ($\beta = .736$, $p < .001$) and awareness of neurodiversity ($\beta = .430$, $p < .001$) and negative direct effect on attitude toward inclusion ($\beta = -.442$, $p < .001$). Advocacy had a positive direct effect on school involvement ($\beta = .940$, $p < .001$). Neurodiversity awareness ($\beta = -.636$, $p < .001$) and attitude towards inclusion ($\beta = -.307$, $p < .001$) both had a negative direct effect on advocacy. See Fig 2.

Conclusions: Targeted support (e.g., parent training) on advocacy, school involvement (e.g., communicating with teachers), and neurodiversity (e.g., talking about it at home) may be beneficial for culturally/linguistically diverse and low-resource parents. More research is needed on what leads parents to develop positive/negative attitudes towards inclusion and ways to promote positive perception of inclusion. Finally, the theoretical model could be revised by adding demographics as moderators.

427.033 Paternal Mental Health Outcomes Related to Sex of Autistic Children

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Background:

Parents of children with disabilities face unique challenges affecting their mental health and functioning. Evidence suggests parents of autistic children experience increased stress levels (Estes et al., 2009). Dimachkie-Nunnally and colleagues found that child adaptive functioning and repetitive behaviors predicted caregiver stress, with parent executive functioning moderating this relationship (2023). They noted mental health differences between mothers and fathers, with mothers experiencing more anxiety, depression, and caregiver strain. However, the effect of an autistic child's biological sex on parental wellbeing, particularly for fathers, remains largely unexplored.

Objectives:

The current study examines the impact of child sex on parental mental health and extends previous findings by: 1) including balanced samples of males and females, 2) exploring effects on fathers, an understudied population, and 3) by focusing on the intersection of child sex and paternal mental health.

Methods:

Data were collected from the SPARK database via Research Match and, after case controlling for gender, included 116 autistic children and their biological parents, with boys and girls matched by registration age. Notable demographics include race/ethnicity (63.8% White, 12.9% Hispanic, 4.3% African American, 2.6% Asian, 12.9% multiracial, and 4.3% other), child age ($M = 7.09$, $SD = 3.76$), and occupation (38.8% of mothers versus 3.4% of fathers identified as full-time caregivers). Child measures included the Child Behavior Checklist (CBCL), Vineland Adaptive Behavior Scale-Third Edition (VABS-3), and Social Communication Questionnaire (SCQ). Parent measures encompassed the Patient Health Questionnaire (PHQ-9), Generalized Anxiety Disorder (GAD-7), Wellbeing Scale (WBS), and Barkley Deficits in Executive Functioning Scale (BDEFS). Statistical analyses included Pearson correlations, independent t-tests, and multiple general linearized models to compare gender differences and analyze four main interactions: fathers of autistic daughters, fathers of autistic sons, mothers of autistic daughters, and mothers of autistic sons.

Results:

Fathers of autistic girls showed the highest levels of anxiety ($M = 8.22$, $SD = 5.554$, $p = 0.003$) and depression ($M = 7.69$, $SD = 6.004$, $p = 0.02$), greater executive functioning deficits indicated by lower scores in emotion control ($M = 22.19$, $SD = 7.251$, $p = 0.021$) and inhibition regulation ($M = 32.75$, $SD = 10.029$, $p = 0.046$), and lower wellbeing scores ($M = 4.82$, $SD = 0.875$, $p = 0.02$). Conversely, fathers of autistic boys had significantly better outcomes. Mothers showed no significant differences based on child sex; child social communication scores did not significantly affect parent outcomes.

Conclusions:

This study revealed that fathers of autistic girls exhibited significantly poorer overall wellbeing compared to fathers of autistic boys, and mothers of autistic girls and boys. This finding highlights the need for deeper exploration of fathers' experiences of parenting and may inform future interventions and support for parents, with a focus on tailoring these supports to fathers, especially those with autistic girls, to improve their mental health and overall wellbeing. This study highlights the unique challenges faced by fathers in the context of parenting their autistic children, prompting a shift from the traditional focus on maternal caregiving.

427.034 Peer Attitudes, Peer Victimization, and Well-Being in Black and White Autistic Adults

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Background: Autistic adults often experience social exclusion and victimization, despite expressing a strong desire for close relationships (Sosnowy et al., 2019). This disparity between social aspirations and actual experiences can heighten the risk of poor mental health outcomes. Additionally, individuals with multiple marginalized identities, such as Black autistic people, may face compounded stigma (Jones et al., 2021), exacerbating mental health challenges. Despite the significance of understanding psychosocial risk factors in autistic adults, no previous study has directly explored the link between peer evaluations, victimization, and mental health status among Black and White autistic individuals. **Objectives:** To characterize interpersonal attitudes and behaviors towards autistic adults, and their impact on well-being.

Methods: 32 Black and White autistic adults ($M_{age} = 26.3$ years, $SD = 6.9$) participated in this study. Participants completed questionnaires assessing their lifetime and recent experiences of peer victimization and cyberbullying, as well as questionnaires related to recent experiences of loneliness, depression, and anxiety, which were used to form a composite measure of well-being. In addition to questionnaires, participants completed videotaped conversations, which were edited to 10-second clips. In the second phase of the study, these clips were shown to non-autistic raters, who evaluated each participant on items assessing traits and social interest. Linear regressions were used to determine the relationships between peer attitudes, peer victimization, and well-being.

Results: Peer evaluations significantly predicted victimization, with more positive peer interest ratings associated with greater lifetime victimization ($b = 15.254$, $SE = 7.071$, $p = .042$). There was a significant interaction between race, cyberbullying, and peer trait evaluations ($b = 5.763$, $SE = 2.566$, $p = .035$), with White autistic people who were rated less favorably by their peers also reporting greater online victimization ($b = -9.821$, $SE = 2.301$, $p = .001$), while this relationship was non-significant for Black autistic people ($b = 1.880$, $SE = 4.671$, $p = .694$). Peer trait ratings were significantly associated with well-being, with autistic people who were rated *less favorably* by peer raters also reporting poorer well-being ($p = .009$). However, the opposite relationship was found between peer interest ratings and well-being, with autistic people whose peers showed *greater interest* in interacting with them also reporting poorer well-being ($p = .001$).

Conclusions: These findings highlight the link between peer attitudes and behaviors and poorer well-being in autistic adults. Interestingly, greater peer interest in future interactions was associated with poorer outcomes, highlighting the complex nature of social relationships for autistic individuals. Differences across races were also observed for the relationship between peer evaluations and online victimization. These results emphasize the need for efforts to improve non-autistic perceptions and behaviors towards their autistic peers, as well as the need for supports that address the social and mental health challenges faced by autistic adults, particularly those with multiple marginalized identities, to improve their overall well-being and social outcomes.

427.035 Peer Support Among Autistic Adults: Different Types of Support Addressing Unique Needs

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Background: Social support is an important predictor of quality of life for autistic people (Jeanneret et al., 2022; Kamio et al., 2013). A valuable source of social support for autistic adults are autistic peer support groups. These groups fulfill several of their needs, including establishing friendships, sharing their experiences and advice related to everyday life, reflecting on autism and building a sense of belonging to the autistic community (Chan et al., 2023; Crane et al., 2021; Crompton et al., 2022). However, studies rarely analyze in depth the social networks of autistic adults and the support shared between autistic peers from their perspectives. As such, very little is known about the specific types of support exchanged between autistic peers, the importance of peer support in autistic adults' lives, and how peer support differs from the support exchanged with the non-autistic people in their social network.

Objectives: This qualitative study aimed to explore the types of support, satisfaction and meanings autistic participants attribute to peer support within their network.

Methods: Semi-structured interviews using a name generator were conducted with 21 autistic adults (13 women and 8 men living in Canada, aged 18 to 67 years old, who received a diagnosis from a qualified clinician). These participants specifically mentioned having one or more autistic peers in their social network. A thematic analysis (Braun & Clarke, 2006) was used to identify the key themes related to the types and characteristics of support shared between autistic peers as well as the meanings participants attributed to peer support.

Results: Four key themes were identified, namely peer support, mutual acknowledgement, interference in social interactions, and social engagement in the community. More specifically, results showed that several types of support (emotional, informational, companionship and social-related) were shared between autistic peers and that participants considered peer support as important and addressing unique needs. In addition, all participants mentioned experiencing various forms of interference in social interactions with non-autistic people. However, when interacting with autistic peers, the experienced interference decreased, leading to greater ease of communication and mutual understanding. Shared experiences and challenges promoted the emergence of a sense of belonging to the autistic community, and often led to a desire to become socially involved, as manifested by the creation of self-help structures to defend autistic or disabled people's rights and the undertaking of autism awareness initiatives within several settings. As such, social engagement in turn provided the basis for additional sources of support in the community.

Conclusions: The current study offers insight into how autistic participants perceive peer support and the unique place it takes in their everyday life. By highlighting the characteristics of peer support compared to the support provided by non-autistic people in the participants' social network, this study paves the way for reflecting on how to create opportunities and facilitate spaces that promote peer support. Peer support is not a substitute to professional support, but it seems essential for fostering a collective, positive sense of autistic identity and thus improving quality of life.

427.036 Perceived Impact of ASD on Siblings from 9 to 33 Years of Age

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Background: Siblings of autistic individuals report diverse experiences related to having a brother or sister with autism spectrum disorder (ASD). Parents of autistic individuals have described negative impacts related to caregiving across financial, social, and emotional domains (Christopher et al., 2023). Less is known about the perceived impact of ASD on siblings over time, and how this relates to sibling engagement later in life.

Objectives: The aim of this study was to identify longitudinal trajectories of parents' perceived impact of ASD on siblings. We also aimed to examine how characteristics of autistic individuals, siblings, and parents predicted trajectory class and sibling engagement.

Methods: Parents were recruited from a longitudinal study of children diagnosed with autism or related developmental disabilities by approximately 3 years old. Inclusion criteria for the present study was parent completion of the Child and Adolescent Impact Assessment (CAIA) at least twice. The sample included 158 parents across four timepoints. Child mean age at T1 = 10.0 (1.1) years, T2 = 13.6 (1.5), T3 = 19.6 (1.3), T4 = 33.9 (3.3). At each timepoint, parents reported the perceived negative impact of their autistic child's problems on their relationship with their other children, the relationships between their children, their other children's behavior, and restrictions on family social activities. A subset of siblings (n=31) described engagement with their autistic sibling as an adult (i.e., living arrangements, how often and who initiates communication or activities). Linear mixed effects models were used to describe change in perceived negative impact over time. To determine trajectory classes, k-means was used to cluster longitudinal data (Genolini et al., 2015). Child characteristics at T1 (ASD symptom severity, cognitive ability, daily living skills, aggression), sibling characteristics (sex), and parent characteristics (social support, race, parent education, divorce) were included as predictors of trajectory class and sibling engagement. Regressions were corrected for multiple comparisons.

Results: From 9 to 33 years of age, we observed decreases in parents' perceived negative impact of ASD on their relationship with their other children ($p<.001$), the relationships between their children ($p<.001$), their other children's behavior ($p=.010$), and restricted social activities ($p<.001$). Longitudinal clustering yielded two impact classes: a high and low impact class, both decreasing over time. More aggression predicted membership in the high impact class for impact on relationships between children ($p=.035$), but this did not remain significant after correction. Higher ASD symptom severity ($p=.014$) and lower daily living skills ($p<.001$) predicted membership in the high impact class for impact on restricted social activities. As adults, 29% of siblings lived with their autistic sibling. Autistic siblings most often initiated activities, and frequency of communication ranged from yearly to daily. Autistic individual, sibling, and parent characteristics did not predict sibling engagement into adulthood in a small subset of siblings.

Conclusions: The current study examines trajectories of parents' perceived negative impact of ASD on siblings over 20 years. As siblings get older, parents reported decreased perceived negative impact on siblings. Future work explores siblings' perspectives, particularly as family systems change and different roles emerge.

427.037 Perceived Stigma and Support from Extended Relatives By Chinese Parents of Autistic Children

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Background: Extended relatives (e.g., grandparents, uncles, aunts, and cousins) can be an important source of support, but also a potential stressor for parents of autistic children. In mainland China it is common to live in extended family households or share childcare responsibilities with the broader family. However, parents of autistic children may encounter stigma, even from their own relatives. To date, few quantitative studies have explored factors associated with stigma and support from extended relatives.

Objectives: We aimed to (1) develop and validate scales measuring stigma and support from extended relatives; (2) describe the levels of stigma and support as perceived by parents; and (3) identify factors linked to stigma and support from extended relatives.

Methods: A total of 233 Chinese parents (87% mothers) of autistic children (mean age = 6.72yrs, SD = 2.43) completed an anonymous Qualtrics survey. Parents provided demographic information about their autistic child, themselves, and their family. Four scales were developed and validated to assess extended relatives' i) stigma against the autistic child; ii) stigma against the parent; iii) frequency and iv) helpfulness of emotional, financial, informational, and instrumental support provided by extended relatives. Using stepwise hierarchical linear regression with 1) child-related factors, 2) parent- and family-related factors, 3) stigma against parents, and 4) stigma against the autistic child as predictors, we examined the relationships among demographic factors, stigma, and support from extended relatives.

Results: Table 1 shows the demographic information; 40% of parents reported they lived with extended relatives; 55% of parents reported their child has daily contact with extended relatives. Figure 1 shows the frequency and helpfulness of support provided by extended relatives. Around 50% of parents indicated receiving instrumental or emotional support at least a few times a month; around 43% found that support at least "generally helpful". Confirmatory factor analyses indicated all four scales were unidimensional, showed good internal consistency and convergent validity. Parents living with extended relatives were more likely to receive more frequent ($p<0.05$) and more helpful support ($p<0.05$). Hierarchical regression models revealed that stigma against the autistic child was significantly associated with lower frequency ($p<0.05$), and reduced perceived helpfulness ($p<0.05$) of extended relatives' support, even when controlling for whether the family and their extended relatives live together. Stigma against parents was associated with support helpfulness ($p<0.05$), but this effect became non-significant after stigma against the autistic child was included in the model. Lower family income significantly predicted stigma experienced by parents ($p<0.05$).

Conclusions: Chinese autistic children have frequent interactions with their extended relatives, with 40% living in extended family households. Extended relatives are a common source of support and their support is considered helpful by many parents. Regardless of whether family members live together, stigmatising attitudes from extended relatives are a factor influencing their support behaviours and whether their support is considered helpful by parents. Future research and practice should recognise the critical role played by extended relatives in caring for autistic children, and focus on addressing stigma within the family network, especially in families experiencing poverty.



427.038 Perspectives and Experiences of Arab Caregivers of Nonvocal Children with ASD and IDD Who Engage in Challenging Behavior

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Background: Although there has been a rise in the prevalence of both autism spectrum disorder (ASD) and intellectual and developmental disabilities (IDD), especially in families from culturally and linguistically diverse (CLD) backgrounds, these families tend to encounter challenges in obtaining necessary information, assistance, and resources, as well as in navigating healthcare and educational systems. Moreover, with increased levels of challenging behavior among nonvocal and minimally vocal children with ASD/IDD, this is a critically under-researched topic in the field. Therefore, we need more research capturing the unique challenges and perspectives of CLD caregivers of these children, especially caregivers from Arab backgrounds. This study aimed to address this gap by focusing on the unique perspectives and experiences of Arab caregivers.

Objectives: The objective of this study was to qualitatively investigate the perspectives and experiences of caregivers from Arab backgrounds, living in the US, of children with ASD/IDD who are minimally vocal/nonvocal and engage in challenging behavior. Of particular significance was the importance of culturally adapted interventions and coaching for such families.

Methods: This study used semi-structured, in-depth interviews to gather qualitative data from parents of nonvocal and minimally vocal children and adolescents with ASD who live in the U.S. Participants were recruited through network-based snowball sampling using electronically distributed flyers via social media, listservs, and parent advocacy organizations. All interviews were conducted and recorded virtually using Zoom. Afterward, interviews were transcribed and an inductive thematic analysis was applied to the transcripts to identify key themes.

Results: Preliminary findings suggest that Arab caregivers continue to face challenges when supporting their nonvocal or minimally vocal children with ASD. Some common issues include lack of awareness about services available to their children and limited access to workshops or coaching opportunities related to home-based interventions. Some parents expressed the inability to effectively communicate with teachers and administration regarding the service options available to their child both at school and outside of school or about certain cultural norms and expectations that schools may have a hard time understanding. In turn, this makes the burden on parents to teach their children skills outside school even greater. Parents' level of involvement with their child's school or local advocacy organization(s) varied widely with some being extremely involved while others have a difficult time knowing where to start. Overall, some parents also expressed a feeling of isolation or loneliness from their community, whether it be friends and family or the more general Arab community, due to the extreme commitment they have toward their children, both mentally and physically.

Conclusions: This study begins to illustrate and highlight the varying perspectives and challenges faced by Arab caregivers of children with disabilities living in the U.S. The preliminary findings highlight the importance of effective communication and mutual understanding between schools and families to better meet the needs of the children and their families. Future research and interventions should include and take into account the unique perspectives and experiences Arab families have when examining ways to better support their children's communication and behavior needs.

427.039 Pilot Study of an Empirically-Derived Training Program to Enhance Professors' Support for Neurodivergent College Students

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Background: Neurodivergent adults are increasingly attending college, yet their likelihood of completing degrees remains lower than their neurotypical peers (Elias & White, 2018). Despite the value of existing programs for neurodivergent students, few initiatives target the professors who teach and accommodate them daily. There is a need for increased educational supports for this population and the professors who teach them (Zeedyk et al., 2019).

We developed a faculty training program, *NeuroPREP*, designed to improve knowledge, applied strategies, and accessibility of resources to enhance experiences and outcomes for neurodivergent college students through neurodiversity-affirming practices. The program was developed in partnership with an Advisory Committee of faculty, neurodivergent students, and disability support staff, whose feedback ensured its relevance and effectiveness (Bolourian et al., 2024).

Objectives: This pilot study aimed to evaluate changes in attitudes, awareness, and knowledge about neurodiversity among university faculty and assessed the socially validity of *NeuroPREP*. Specifically, we sought to explore how neurodiversity-affirming training could facilitate support of neurodivergent college students.

Methods: Participants included faculty and staff ($n=63$; $M_{age}=46.2$, $SD=11.72$) at a four-year university, who were predominantly female (79.4%) and White (42.9%), with 25.4% identifying as Hispanic/Latine.

Participants were given four weeks to complete four asynchronous modules, each including a 20-minute video, handout/exercises, resources, and learning check. The training focused on neurodiversity-affirming strategies, such as recognizing and valuing neurodivergent strengths, implementing inclusive teaching practices, and fostering supportive environments. Data were collected via pre- and post-training surveys assessing neurodiversity knowledge, awareness, and attitudes. At post-training, we also assessed learning satisfaction and perceived impact.

Results: Results revealed significant improvements in knowledge, attitudes, and acceptance from pre- to post-training. For example, correct identification of ADHD characteristics increased from 70.5% to 88.5%, $p<.01$. Participants reported significantly greater comfort in having autistic students in their classroom (45.0% to 77.5%, $p<.01$), and working one-on-one with autistic students (54.0% to 74.0%, $p<.05$). Similar significant improvements were noted for ADHD students. Confidence in teaching autistic ($t(51)=-8.10$, $p<.001$) and ADHD students ($t(51)=-8.97$, $p<.001$) significantly increased, as did understanding of disability support services ($t(58)=-3.40$, $p<.001$).

Participants rated the training highly on seven indicators of learning satisfaction (e.g., "I would recommend this training to faculty members on my campus."), with 76.2% to 95.2% participants either selecting "Agree" or "Strongly agree" on each indicator. Participants also rated the training highly on nine indicators of perceived impact (e.g., "The training has improved my understanding of the unique strengths of neurodivergent college students."), with 78.4% to 93.7% participants either selecting "Agree" or "Strongly agree" on each indicator. The training's perceived impact extended beyond classroom teaching, as 87.3% agreed it would be useful in interactions with students outside the classroom. Qualitative analysis of open-ended responses (e.g., "In your own words, how would you define "neurodiversity?") is underway.

Conclusions: *NeuroPREP* effectively improved university faculty and staff's knowledge, attitudes, and confidence in working with neurodivergent students. Participants rated the training highly, highlighting its value in fostering more inclusive and supportive environments for neurodivergent students.

427.040 Policy Analysis on the Parents and Self Advocacy for Autistic Individuals/Families Access to Federal Funds for Community Based Services, Independent Living, Caregiver Respite.*R. P. Gaines, School of Public Policy, University of Maryland, College Park, MD*

Background: The autism community and general population are not adequately informed on policies that give autistic individuals/families access to federal funds for community-based services, independent living, or caregiver respite. It is imperative to understand these policies, their effects, changes that need to be implemented, and the methodology that can be utilized to implement these changes.

Objectives: Carry out a systematic literature review (using academic, policy, and practice sources) on: Policy advocacy in relation to resource accessibility to people on the autism spectrum and autism-oriented families. (Aim 1) Informing families of policies giving access to federal funds for community-based services, independent living, caregiver respite, etc. This includes exploring information on policies related to autism/family so they know how to advocate for themselves and seek/access services. (Aim 2) Explore relevant policies analyzing the effects of not engaging with said policies on long-term outcomes. (Aim 3) Understand what communities are involved in policy advocacy and the steps needed for change.

Methods: We will collect data and gather research related to autism/family policies and policies giving access to resources like disability advocacy, federal funds, community-based services, independent living, caregiver respite, etc. We will then carry out a systematic literature review (using academic, policy, and practice sources) on tools like PsycINFO, PubMed, etc. This will allow for an analysis of policy advocacy in relation to resource accessibility to people on the autism spectrum and autism-oriented families. We will run a quantitative regression analysis of policy expenditures, including a secondary comparative analysis of long-term outcomes through an application like ANOVA with and without access to monetary funds and policies. This data will then be compiled into a visual analysis of the information gathered.

Results: While the results of my data have not been fully collected, my preliminary data analysis is based on a study done for INSAR by Julie Lounds Taylor, Leann Smith DaWalt, Meghan M. Burke, James C. Slaughter, Meng Xu called: "Improving parents' ability to advocate for services for youth with autism." In this study: "parent advocacy abilities were collected at baseline (before randomization) and post-test (immediately after the treatment group finished the 12-week program) by survey. After taking ASSIST, the treatment condition had greater gains than controls in knowledge of adult services ($B = -1.62$, $CI = -2.33$ to -0.90) and perceived advocacy skills ($B = -0.19$, $CI = -0.33$ to -0.04)" (Taylor, August 8th, 2023).

Conclusions: I have no results; however, said results may be similar to those found in a case from the UK. In the case of the UK, the results show four main takeaways. Partnerships with autistic people, alongside caregivers and stakeholders, throughout the engagement, involvement, and co-production processes improve development. Second, it is important to assess intervention practices and their alignment with a neurodiversity framework and the views of autistic people. Finally, greater regard within intervention programs leads to improved efforts to develop and validate tools to measure autistic prioritized outcomes and the goodness-of-fit between an autistic individual and their environment (Aldred, el. 2004).

427.041 "I See My Child in a New Light": Mindful Self-Compassion for Caregivers of Autistic Children

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Background: Our study evaluates a digital Mindful Self-Compassion (MSC) intervention for caregivers of autistic children in British Columbia, Canada. In collaboration with community partners, this Zoom-based group program was developed early in the COVID-19 pandemic in response to an urgent need for family-centred, remote interventions. Caregivers often experience high stress, feelings of isolation, and increased financial strain due to additional demands of raising an autistic child, and these challenges were exacerbated by pandemic-related stress (Fong et al., 2020). MSC-based interventions can enhance parental well-being, build caregivers' coping strategies and reduce depressive symptoms (Ruiz-Robledillo et al., 2015; Ahmed & Raj, 2023). Increased parental mindfulness can also benefit children, as parents learn to be responsive rather than reactive in everyday interactions (Kil et al., 2021), reducing their child's emotional distress and efficiently managing challenging behaviour (Siegel, 2007; Siegel & Hartzell, 2013). However, traditional autism interventions primarily target children, and there is a dearth of family-centered interventions despite clear research support for these approaches (Ooi et al., 2016; Gardiner et al., 2020).

Objectives: To investigate the effectiveness of a Mindful Self-Compassion-based intervention for caregivers of Autistic children.

Methods: This mixed-methods study involved forty caregivers ($M_{age}=42.82$, $SD=6.7$; 2 fathers, 1 foster mother) of autistic children ($M_{age}=10.17$, $SD=4.4$). Caregivers participated in one of four offerings of the eleven-week online MSC program between 2021 and 2024. Pre-post quantitative measures assessed the program's impact on parental outcomes, including stress, anxiety and depression, self-compassion, mindfulness, parenting sense of competence, and family quality of life (FQOL). Qualitative surveys explored changes in the parent-child relationship and the perceived benefits of this intervention.

Results: Preliminary analyses through paired samples t-tests on outcome measures revealed significant improvements across all measures except anxiety. Cohen's D effect sizes showed large effects for Mindfulness ($d = 1.04$), Self-Compassion ($d = 0.77$), Parenting Sense of Competence ($d = 0.87$) and Quality of Life ($d = 0.56$) and moderate effects for Depression ($d = -0.61$) and Stress ($d = -0.73$). Preliminary thematic analysis of qualitative survey results showed that participants experienced multiple benefits from this program in addition to learning important mindfulness and self-compassion skills. The following themes were identified: "I learned how to care for myself," "I feel less alone," and "I am a better parent to my child."

Conclusions: Caregivers experienced significant improvements across mindfulness, self-compassion, family quality of life, parenting sense of competence and psychiatric symptoms. Participants also experienced an enhanced sense of community and learned valuable self-care strategies. This program impacted the entire family unit through increased FQOL, with parents reporting improved relationships with their children. The MSC intervention addresses the critical need for research that enhances the lives of autistic individuals and their families, responding to their calls for holistic, neurodiversity-affirming support that enhances family acceptance of autistic individuals. Our study also highlights the need for further research of both MSC-based supports and interventions that support family well-being.

**427.042** Preferences of Spanish-Speaking Individuals from Northern Argentina When Referring to Autism

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Background: There are numerous studies worldwide exploring the language used to refer to autism, as this can reveal implicit epistemologies related to prevailing paradigms. While there is a substantial body of research conducted primarily in English and French, Spanish-language studies are less common. In Spanish, the terms "autista" (autistic) and "autismo" (autism) are still sometimes used in media and social networks as insults, discriminatory terms, or part of ableist practices. Conversely, within the autistic community, often under the neurodiversity paradigm, there are reflective movements aimed at changing assumptions, practices, and the language associated with these concepts. Given the territorial, historical, and sociocultural diversity within Argentina, we focused on the NOA region, corresponding to the northern Andean region. Our perspective in engaging in this research is the interest in this topic within inclusive education, as the epistemology implied in the preferred terms for talking about autism involves positions and cuts that are related to educational assumptions and practices.

Objectives: To understand the preferences of speakers from northern Andean Argentina regarding terms used to refer to autism. To analyze similarities and differences compared to the results of similar studies conducted in other regions and linguistic contexts.

Methods: This is a "mixed method" study - commonly understood in the context of autism studies as the coordinated use of qualitative and quantitative strategies. Data was collected online using ad hoc forms. Participants were given options to express their preference for various terms, indicating one, all, or none of the options. Some examples of items were: "Autistic person or person with autism?", "Child with ASD, child with autism, or autistic child?". The qualitative inquiry aimed to understand the semantic fields assigned by speakers to preferred or non-preferred terms, in the words of the participants.

Results: The results of the research in the context of Spanish spoken in northern Argentina generally do not agree with the trends found among English and French speakers in various countries. The results so far indicate a preference for person-first language (person with autism), and to a lesser extent identity-first (autistic person), which is found to a greater extent in other regions or linguistic contexts. Additionally, there is still a preference for forms that associate autism with forms of disorder (ASD) or forms that include a reference to the autism spectrum (ASD or ASC).

Conclusions: This work is in the process of data collection and analysis. It can be advanced that, although it is found that activist movements seem to be emerging and there are some samples of their expression in the studied context, the preferred forms of expression centered on aspects of autistic identity or its valuation from neurodiversity or neuro-affirmation perspectives do not show the consensus that studies find in other regions or linguistic contexts. This could be due to a lack of knowledge of these relatively new points of view, at a general level, in our region, and especially among non-autistic people, the phenomenon known in Argentina as "centralismo porteño" (Buenos Aires-centrism) could also influence.

427.043 Priority of Autism Research, Services, and Public Education Among Autism Community Stakeholders in Hong Kong

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Background:

Development of autism research and services have traditionally been directed by academicians and policymakers. There needs to be greater involvement of community members in research to set priorities that can directly impact their lives. However, existing priority setting exercises have been conducted only in Western countries, leaving the voices from non-Western societies unheard.

Objectives:

To understand the needs and priorities in autism research, services, and public education among autism community stakeholders in Hong Kong

Methods:

Participants included 31 autism community stakeholders locally recruited in Hong Kong representing three groups: 13 autistic adults, 12 parents of autistic individuals, and 6 professionals with experience working with autistic individuals. We held 3 in-person and 4 online groups, followed by two surveys. The group processes were focused on answering three questions: What do you wish for the future development of Hong Kong autism (1) public education, (2) research, and (3) services or support? Nominal Group Technique (for question 1) and Modified Delphi Method (for questions 2 and 3) were used to guide the discussion and consensus processes, which involved brainstorming and discussing ideas, synthesizing common themes, and individual voting and ranking. Two rounds of survey received 31 (100% response rate) and 28 (90%) valid responses, respectively.

Results:

Among the top-rank themes of public education, autistic adults hoped others understand their different needs and strengths. They also wanted the mainstream society to critically reflect and create an autism-friendly environment, so they can be accepted rather than normalized. Parents sought for others' understanding of autistic individuals' special needs, while not stigmatizing autistic differences. Parents also desired the public to forgive autistic behaviors and know how to appropriately interact with them. Professionals noted the wide spectrum of autistic individuals, but were more focused on the role of adequate support and education that can help autistic individuals thrive. They also stressed that the public needs to understand how autistic brain processes information and their sensory needs.

Summary of top 5 rankings of research and service themes can be found in Tables 1 and 2. Among the top priorities of research themes and service themes, more parents endorsed research about autistic behavioral and psychological presentations and services about providing trainings to autistic individuals to improve their social and adaptive skills, reflecting parents' desire to seek the right strategies to deal with autistic symptoms and behaviors. More autistic adults and professionals prioritized research reflecting autistic perspectives or strengths and advocated for increasing public understanding towards autism, reflecting more neurodiversity-affirming perspectives. Adult research was ranked by all stakeholder groups as important. Autistic adults desired more involvement in service development.

Conclusions:

This is the first priority setting exercise focusing on autism in Asia region. Despite the small sample size, anecdotal feedback from participants praised the meaningful research engagement in determining directions for future development of autism. Findings can directly inform priorities in autism research and policies. Differences across groups can also inform public education campaigns to target the narratives and beliefs of specific subgroups.



427.044 Professional Development Training in Inclusive Practices for Staff in Informal STEM Learning Settings

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Background:

Informal learning settings like museums and science centers are associated with higher engagement for learners, even when topics are challenging or less preferred (Bell et al., 2009). However, autistic learners and their families report that some aspects of museum visits can be stressful and overwhelming (Fortuna et al., 2024), which may result in reduced inclusion, engagement, and impact (Matthews et al., in press). Research is needed to develop and implement inclusive practices in informal learning settings to increase inclusion and accessibility for autistic learners.

Objectives:

To examine feasibility of a professional development (PD) training in inclusive practices for museum staff.

Methods:

An existing training and consultation program in inclusive practices was adapted based on stakeholder feedback and delivered to 79 staff members at four STEM-related museums in the Greater Phoenix area (see Table 1). Each museum designated a core team of 4 to 5 administrative leaders ($n = 19$) to work closely with the consultant conducting the professional development (PD) training. Members of each core team completed an inclusion checklist (adapted from Kids Included Together Checklist for Inclusive Programs) to provide insight into the state of the respective museum's inclusive practices before the PD training. This information was used to tailor the training to staff at each museum. Core team members ($n = 15$) also completed the checklist after staff training was complete.

Staff at each museum, which included an additional 51 forward-facing staff (18 front desk employees, 28 educators, and 5 volunteers), attended a didactic presentation that included an introduction to autism and inclusion. Then, two Board Certified Behavioral Analysts used Behavioral Skills Training (BST) to teach seven core competencies (Composure; Connection; Engagement; Inclusive Language; Accommodations and Accessibility; Active Listening, and Visual Supports) to forward-facing staff. Each staff member practiced the respective competency until fidelity of implementation (FOI) was achieved (mastery criterion = 80% or greater) across a minimum of three interactions. Additionally, up to four probes were collected across the study (baseline, two time points during training, and training exit) to measure FOI of inclusive practices (pre- and post-training probes were completed for $n = 44$).

Results:

Reported in Table 2, there was a significant increase from baseline to post-training in ratings on the inclusion checklist by core team members (Wilcoxon Signed Rank Test $z = 3.11$, $p = .002$). There was also a significant increase in fidelity of implementation of inclusive practices (Wilcoxon Signed Rank Test $z = 5.91$, $p < .001$). FOI mastery criterion of 80% or greater was achieved by 98% of participants with pre- and post-training probes.

Conclusions:

This study represents the first phase of larger project that aims to build capacity for improved inclusion and accessibility in informal STEM learning settings. Findings demonstrate feasibility of an individualized PD training for forward-facing staff. The second phase of this work is underway and will adapt the training to increase scalability. We will also examine autistic learners' perceptions of inclusion and accessibility during visits to museums whose staff engaged in the PD training.



427.045 Psychosocial and Financial Burden and Coping of Families of Children with Autism Spectrum Disorder - Indian Experience

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Background:

Autism spectrum disorder (ASD) is a complex neurodevelopmental disorder and can have significant psychosocial and financial impact on families. There is a dearth of evidence from India on these impacts and associated coping mechanisms.

Objectives:

Objectives were to assess the psychosocial burden of families with children with ASD, the out-of-pocket (OOP) expenditure towards support and the different coping mechanisms for psychosocial and financial burdens.

Methods:

This prospective study was conducted in a tertiary hospital in India between August 2020 and December 2021. Children aged 2-18 years of age with a prior diagnosis of ASD of at least 6 months were included and those with neuro-metabolic or neuro-progressive conditions excluded. Semi-structured questionnaires on sociodemographic and financial analysis were administered along with the Family Burden Interview Schedule. Financial burden was assessed by calculating medical, non-medical and indirect costs.

Results:

The study enrolled 115 children with a median age of 4 years, 83.5% males. Socio-economic status evaluation showed that 31.3% families were in the lower middle-income group, 13.9% in the upper lower, 46.1% in upper middle and 8.7% in the upper income strata groups (by modified Kuppuswamy scale). Majority of the parents in our study were graduates which included 89 (77.4%) mothers and 77 (67%) fathers. The median monthly family income was 40,000 INR. Severe autism was seen in 55% of our children as evaluated by Childhood Autism Rating Scale -Second edition.

Evaluating family burden pattern, subjective burden was reported by 95.7% of families. The highest burden was noted in the mental health domain (49.5%), followed by physical health (41.8%). Problem-focused coping methods (43%) were most noted followed by finding comfort in religion (28%).

Median total costs for autism support for the last 6 months were 63745 INR (range 5550 – 9,34,395) and were out-of-pocket (OOP). Median total direct costs were 43745 and indirect costs 20000. Though 13.9% families had insurance, no ASD support services were covered. A multivariate logistic regression model showed that severity of autism and co-morbidities were associated with moderate to severe financial burden. Predominant financial coping mechanisms included using monthly salary (85.2%) and savings (64.3%).

Conclusions:

There is high psychosocial and financial burden for families of children with ASD, with predominant OOP expenditure. Problem-solving coping was utilized, with a financial coping strategy of drawing from savings. These results highlight the need to develop further psychosocial and financial support for these families.

427.046 "I Want to be a Voice for Not Only Myself, but Also the Autistic Community": Experiences of Autistic Community Partners in Post-Secondary Education Autism Research in Canada

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Background: Autistic advocates have long called for more equitable partnerships and greater decision-making power in autism research, which has traditionally prioritized the perspectives of allistic researchers, clinicians, and caregivers with neuronormative agendas.¹ With recent shifts towards a neuro-affirming paradigm, there is growing implementation of Autistic advisory boards and participatory research methods in recognition of the harm past research has done to Autistic people.² The Campus Belonging Network (CBN) employs a participatory approach to explore the experiences of Autistic post-secondary (PS) students in Canada.³ This approach emphasizes inclusivity, transparency, and a focus on enhancing the quality of life, as defined by Autistic individuals.⁴ To further amplify Autistic perspectives, particularly those most marginalized within our community, reflexivity on the experiences of Autistic people as researchers is critical amongst a history of research-based violence.⁵ Seligman's **PERMA** model of well-being—Positive Emotions, Engagement, Relationships, Meaning, and Accomplishment⁶—provided a lens to evaluate the impacts of serving as an Autistic Community Partner (ACP) within the CBN.

Objectives: To explore the perspectives of ACPs on the impact of their involvement in an Autistic-led research project focused on fostering belonging for Autistic PS students in Canada.

Methods: ACP members were recruited through social media and the project team's networks. Eligibility criteria included being Autistic, aged 18+, a Canadian citizen or Permanent Resident, current or former PS student, and being available to complete required tasks, meetings, and training. Pre/post survey questions collected information on what the ACP members predicted they would gain, and ultimately gained from participating in the CBN. A hybrid analytical approach was used. Data were analyzed using a deductive codebook approach; responses were divided into thought units and categorized according to one or more **PERMA** pillars. Then, data were inductively coded into sub-themes within each pillar using a six-step thematic analysis process.⁷

Results: Four applicants (aged 27 to 46) who represented diverse backgrounds, including Indigenous and queer communities, were selected as ACP members. Aligned with the **PERMA** model, they reported enhanced well-being through participation with the ACP, noting Positive emotions such as passion, gratitude, and enjoyment. Deep Engagement emerged from 1) a psychologically safe environment and 2) active research participation. They valued the sense of community (Relationships) as 1) a safe space to be authentically Autistic and 2) to connect with like-minded peers. ACPs felt a sense of Meaning because 1) they believed they were making a difference, deepening their conviction that Autistic-led autism research is vital, and 2) felt they could now envision new directions for their future. They also experienced overlapping Accomplishment and Meaning through 1) empowerment to create positive change, 2) accessing typically excluded spaces, and 3) developing new research skills. Relationships also contributed to a sense of Accomplishment by 1) expanding their neuro-affirming perspectives and 2) by growing their social network, which led to new opportunities.

Conclusions: ACP involvement benefited participants' well-being, where amplifying Autistic perspectives within our project empowered ACPs personally and professionally as they collaborated on research on Autistic PS students' belonging.

**427.047** "Diagnosis As an Instrument": The Lived Experiences of Autistic Adolescents in Taiwan

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Background: Autistic people tend to experience longstanding difficulties navigating the social world. In Taiwan, most autistic people receive their autism diagnoses in childhood or adolescence. However, little is known about what an autism diagnosis means to Taiwanese autistic adolescents themselves and how the diagnosis influences their social navigation.

Objectives: To explore the experiences of Taiwanese autistic adolescents receiving autism diagnoses, and how the diagnoses affect their life and social navigation.

Methods: We enrolled 8 autistic adolescents aged 14-18 years (3 assigned-male-at-birth and 5 assigned-female-at-birth; Table 1), who received their autism diagnoses between the ages of 8 and 18 (0-7 years prior to the interview). In-depth individual interviews were conducted using an interview guide (Table 2). All interviews (average duration 43 minutes) were audio-recorded, transcribed verbatim, and analyzed by thematic analysis. Initial codes were generated from the data according to their explicit and implicit meanings. Categories were generated from codes with similar meanings, and related categories were integrated into themes. Data collection and analysis occurred concurrently, while new participants were enrolled until saturation was reached.

Results: We identified four themes across participants. The autistic adolescents in Taiwan identified their autism diagnoses serve the roles of: (a) explaining their past life experiences, with both positive and negative stereotypes; (b) understanding own behaviors and providing a framework for modifying own behaviors; (c) articulating their difficulties and facilitating their family members' and peers' understanding of them; and (d) negotiating with the regulations of the Taiwanese educational system to meet their needs. These Taiwanese autistic adolescents were already aware, to varying degrees, of their differences from others before receiving a formal autism diagnosis. Receiving the autism diagnosis provided explanations for previously unarticulated feelings of social unalignments. While the autism diagnosis carried risks to experiencing stigma and reinforcing stereotypes, it could in fact reduce stigma and highlight positive traits. With the diagnosis as a label, autistic adolescents found a keyword for searching information, understanding themselves, recognizing their differences from others, and modifying their social behavior to mask their difference. The diagnosis also served as a gateway to the autistic community, enabling autistic adolescents to connect with peers and access a shared language to describe their difficulties, facilitate greater understanding and acceptance. The diagnosis may be used by autistic adolescents to negotiate with the Taiwanese education system (which can be inflexible with strict regulations) for their needs to be met. Some adolescents received autism diagnoses through referral from the education system to the medical system initially, and the confirmed diagnosis in turn increased (both superficially and actually) the flexibility of the educational system to accommodate their differences.

Conclusions: Our findings highlight the instrumentality of an autism diagnosis in Taiwan, and how autistic adolescents make use of their diagnosis to understand themselves and to interact with their environments.



427.048 Quality of Life of Parents of Children on the Autism Spectrum: A Cross-Country Comparison

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Background: Parents of children on the autism spectrum often face unique challenges that can impact their quality of life (QoL). Cross-cultural differences and nation-specific health systems may influence how parents experience these challenges. Singapore and Malaysia are neighboring countries that have similar multicultural populations but with distinct healthcare systems that may influence QoL.

Objectives: To examine and compare the QoL of parents of children on the autism spectrum in Singapore and Malaysia and factors associated with them.

Methods: Cross-sectional studies were conducted in each country's tertiary developmental pediatric clinics, each with a study sample of children diagnosed with autism based on DSM-5 criteria. Parents completed the Quality of life in Autism Questionnaire (QoLA), which contains 2 sub-scales: Part A measures parental self-rated QoL (score range 28-140, higher scores denote greater perceived QoL); Part B measures perceived problems due to child's autism-related behaviors (score range 20-100, higher scores denote fewer perceived problems). Parents also completed a demographic questionnaire and provided information on co-occurring conditions and medication use. Independent T test was used to compare the total QoLA scores, while Chi-square test was used to compare the individual questions. General Linear Model was used to identify differences in QoLA responses and factors associated with QoLA by testing the interaction effects between country and the factors of interest. When significant interaction was detected, a subgroup analysis by country was conducted.

Results: The sample comprised of 300 parents ([N=134 from Singapore, child mean age: 6.1 years, 79.8% male] and [N=166 from Malaysia, child mean age: 7.68 years, 81.3% male]). Total QoLA scores were high in both countries with no significant difference between the them (103 vs 101.63 for Part A, $p = .156$ and 70.08 vs 69.77 for Part B, $p = .887$ respectively). For QoLA Part A scores, parents from Singapore reported higher scores in life satisfaction, financial stability, and safety while parents from Malaysia reported higher stress and feelings of guilt but better scores for adopting a healthy lifestyle and perceived better community support (Table 1). For QoLA Part B scores, parents from Singapore perceived less difficulties with their child's ability to socialize, and in managing their anger while parents from Malaysia perceived fewer challenges with their child's obsessive interests, inappropriate emotional reactions, repetitive behaviors, ability to understand other's feelings and the child's actions being seen as embarrassing (Table 2). Subgroup analysis showed that QoLA part A score was higher in Malaysia for parents who were from a non-low-income family ($p = 0.075$), were married ($p = 0.009$), and when either the father or mother had tertiary education ($p = 0.064$; $p = 0.036$). However, in Singapore none of the study factors was significantly associated with QoLA part A score.

Conclusions: Parents from both countries had similar overall QoL scores although differences were present in specific aspects of QoL and factors associated with QoL. These can inform targeted interventions to improve QoL. Further research should focus on the role of healthcare structures impacting QoL while remaining culturally sensitive.



427.049 Racial-Ethnic Differences in Prolonged Autism Diagnosis Process & Diagnoses Received Prior to Autism in 23 States
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Background: Autism spectrum disorder (herein: autism) symptoms are known to overlap with other developmental conditions, leading to diagnostic delays. Prior research showed that children from minoritized racial and ethnic backgrounds experienced high rates of diagnostic delays and acquired other developmental diagnoses before their autism diagnosis. Even so, these diagnostic trends and disparities have not been recently investigated as racial and ethnic disparities in autism prevalence decrease.

Objectives: Replicate previous assessment of prolonged autism diagnosis process and diagnoses received before autism, in a national dataset of children with Medicaid/CHIP insurance.

Methods: Using Transformed Medicaid Statistical Information System Analytic Files (TAF) from 23 states with sufficient claims volume and complete data, we conducted a retrospective cohort analysis of children ages 2-8 entering specialty mental healthcare (SMH) during 2017 who ultimately received an autism diagnosis within 2 years. We assessed prolonged diagnosis process (PDP), defined as >90 days between initial SMH entry and subsequent autism diagnosis to account for the multiple visits often needed to diagnose younger children. Unadjusted and adjusted (by sex and age; further, by rurality and state) Ordinary Least Squares Regression models were used to assess racial and ethnic differences of children with PDP. Among those with PDP, mental health diagnoses received in SMH before an autism diagnosis were also evaluated and modeled by race and ethnicity.

Results: Of 21,782 children with an autism diagnosis in our sample, 4,585 (21.2%) had a PDP. In contrast with previous research, PDP was most common among white children (22.8%) and least common among Asian children (15.1%). In adjusted models, Asian and American Indian/Alaska Native (AI/AN) children were significantly less likely than white children to have PDP (Figure 1). Though there was substantial variation in PDP by state (14% to 31%), there were no notable differences in effect estimates after adjusting models for age, sex, or residence rurality. Among children who experienced a PDP, ADHD was the overall most commonly received diagnosis prior to autism (38.6%), followed by speech and language disorders (21.0%), and the non-specific “other neurodevelopmental disorders” diagnosis (20.4%). Similar to prior research, frequency of prior diagnoses received prior to an eventual autism diagnosis varied by race and ethnicity (Figure 2). Even in adjusted models, there were significant racial and ethnic disparities for prior diagnoses acquired. For example, AI/AN children were significantly more likely, while Hispanic and Asian children were significantly less likely, to have a prior diagnosis of ADHD compared to white children.

Conclusions: More than 1/5 of Medicaid-enrolled children with autism in our sample experienced a PDP after SMH entry; however, findings suggest prior trends of increased PDP in children from minoritized racial and ethnic backgrounds have decreased or reversed. Racial and ethnic differences remain in diagnoses received prior to an autism diagnosis, particularly for ADHD, speech and language disorders, and non-specific signs of developmental delay.



427.050 Re-Negotiating the Asian American Autism Family Relationships Among Non-Autistic Adult Siblings: A Data-Driven Theoretical Model

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Background: “Autism” is as much of a family experience as it is an individual one. For families of individuals on the autism spectrum, the shared familial experience of living with and adjusting to the autistic family member’s disability can have profound impact on the collective family unit, as well as the nested sub-units. For Asian American families of Confucian-ethnic heritage, the centrality of familism and the integral role of relationship-oriented family dynamics are profoundly important. Asian Americans represent one of the fastest growing populations in the United States. Yet, relatively little is known about the Asian American family relationship processes, in general—and even less among those with an autistic family member. Within the Eurocentric mainstream autism research and clinical practice, the voices and perspectives of individuals from marginalized family backgrounds, such as immigrants, lower socioeconomic status, and limited-English-speaking households, remain largely absent. This lack of diversity and inclusion is especially problematic, as any innovation made towards future autism-related interventions run the risk of imposing ethno-culturally incongruent practices. Regardless of the autism family’s sociodemographic background, non-autistic siblings are uniquely situated and can possess one of the longest lasting relationships with the autistic child-family member. For the non-autistic Asian American child-family member of immigrant parents, involvement in various aspects of the family life is common and expected.

Objectives: This qualitative grounded theory study sought answers to the research question: *How do adult individuals who have an autistic sibling within Asian American immigrant families from Confucian-ethnic heritages experience their family relationship processes over time?* Participants’ narratives informed the data-grounded theoretical model on the Asian American autism family relationship processes among non-autistic siblings from an immigrant and Confucian-ethnic family background. The emerged theoretical model was presented pictographically, alongside with select quotes to illustrate the family relationship processes and shifts across the developmental course.

Methods: Using a constructivist and critical-ideological lens as the guiding research paradigm, semi-structured interviews were conducted with twelve Asian American non-autistic adult siblings. Data collection was completed once data saturation was reached. A constant comparative data analysis approach was utilized to produce the data-grounded theoretical model. The practice of bracketing, memoing, external and internal auditing, as well as member checks were also implemented to ensure research rigor/trustworthiness.

Results: The emerged theoretical model illuminated the Asian American autism family relationship processes as dynamic and embedded within the autism and cultural contexts. The model also demonstrated the influence of the non-autistic siblings’ internal “paradigm shift” and developmental familial shifts on the ways in which these family relationship processes are re-negotiated over time.

Conclusions: Findings from this study both supported and expanded the existing, albeit scarce, published research on the Asian American autism families. The lived experiences of family relationships among non-autistic Asian American adult siblings undergo on-going processes of negotiating and adapting across their developmental course and family life cycle. Findings from this study calls for individual- and family-level support and resources that can promote positive meaning-making of the Asian American autism family relationships. Implications for future research will be further discussed.

427.051 “Creating a Socially Acceptable Version of Myself”: A Qualitative Exploration of the Female and Nonbinary Experience of Navigating the Autism Diagnostic System

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Background: Early diagnosis for autistic youth is critical in improving quality of life. However, diagnosis is typically delayed for AFAB and gender diverse individuals, with their autism-related struggles being overlooked.

Objectives: The current study utilizes semi-structured interviews with autistic adults to explore how gender identity and socialization impacts diagnostic odysseys. As such, we examined the following research questions: 1) What are the female and nonbinary experiences with pursuing an autism diagnosis? 2) What was the experience like receiving and coping with an autism diagnosis?

Methods: Qualitative interviews were conducted with 24 autistic adults identifying as nonbinary, agender, or genderfluid (n = 14), female (n = 8), and male (n = 2). Coding used reflexive thematic analysis, informed by tenants of gender socialization roles and feminist disability model.

Results: Participants reported experiencing clinician bias within the mental health system, being mislabeled, having difficulties navigating the diagnostic system, and masking to compensate prior to diagnosis.

Conclusions: This study provides a greater understanding of diagnostic trajectories and the intersection of gender socialization with their coping strategies for navigating life without a diagnosis. This informs future practices in reducing diagnostic biases and the toll of compensatory mechanisms used in the interim.

427.053 Represent AIM: A Systematic Review and Meta-Analysis of the Sample Demographics in Autism Intervention Research

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Background: There has been an immense amount of research conducted on potential intervention approaches for autistic children. However, primary studies of candidate interventions often do not include representative samples; thus, findings for the efficacy of interventions may not generalize to the broad population of autistic children.

Objectives: With REPRESENT AIM, we aimed to explore the demographic makeup of participants in early childhood autism intervention research and to compare the makeup of samples to demographic data from the US Census and the Autism and Developmental Disabilities Monitoring (ADDM) Network. We hypothesized that past studies would have a greater proportion of white, male, non-Hispanic or Latino/a/x participants than would be expected given US Census and ADDM Network estimates.

Methods: The Autism Intervention Meta-Analysis for Studies of Young Children (Project AIM; a systematic review autism early childhood intervention research) is a large meta-analytic dataset containing 290 reports. All reports were double coded for the available frequency count of race using NIH categories (i.e., American Indian or Alaska Native, Asian, Black or African American, Native Hawaiian or Other Pacific Islander, White, Other, Multiracial); ethnicity (i.e., Hispanic or Latino, Non Hispanic or Latino); and parent-reported sex or gender (hereafter, referred to as sex). In a series of planned analyses, the proportion of each demographic category was calculated for each eligible study and we generated the 95% highest-density credible intervals (95% CrIs). The 95% CrIs were compared to data for the autistic population (i.e., 2020 data from the ADDM Network).

Results: There were 130 studies in Project AIM conducted in the US; 119 (91.5%) of these studies reported participants' sex, 97 (74.6%) reported at least some information on participants' race, and 65 (50%) reported at least some information on participants' ethnicity. Compared to ADDM estimates, male participants were significantly over-represented (95% CrI = 81.2%-83.6%; Mdn = 82.4%) compared to ADDM estimates (79%). White participants were also significantly over-represented (95% CrI = 56.7-68.3%; Mdn = 62.3%) compared to estimates from the ADDM (55.5%). All other demographic groups were significantly under-represented compared to ADDM estimates for example, Hispanic participants were significantly under-represented (95% CrI = 10.5%-21.6%, Mdn = 15.5%) compared to the ADDM estimate (27.4%).

Conclusions: Patterns of reporting participant demographic information across primary studies testing effects of autism interventions are poor. Results suggest that females and all racial and ethnic minority groups are underrepresented when compared to the demographic data in the ADDM network. This result, sadly, accords with findings for representation across broader biomedical and social sciences research. The lack of representative samples indicates that we cannot generalize results from extant studies to the full population of autistic individuals. This study has important implications for autism intervention research and leads to calls for great improvements in representative sampling and cultural adaptations of interventions that may be assessed in diverse populations.

427.054 Research on the Experience of Psychiatric Drug Use in People with Autism: From a Parent Perspective.

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Background:

While behavioral interventions remain a cornerstone in supporting individuals with autism, psychotropic medications are often prescribed worldwide to address associated symptoms, such as anxiety, aggression, and hyperactivity (Alfageh et al., 2020). Overall, 35% of patients used at least one psychotropic medication, most commonly stimulants, neuroleptics and/or antidepressants (Rosenberg et al., 2010). To develop better outcomes, it is imperative to examine parental perspectives as they are pivotal advocates for ensuring the judicious use of psychotropic medications in the autism community.

Objectives: The purpose of this study is to understand the status of psychotropic medication use among autistic individuals and how South Korean mothers perceive its effects and communication process.

Methods:

The current study employed a qualitative design and conducted individual interviews with 19 parents of autistic individuals. To be included in the study, participants are required to be over 18 years old, have an adult child diagnosed with autism, and currently receive psychotropic medication. Overall, parents' ages ranged from 50 to 72 years ($M = 55.39$, $SD = 1.88$), and 38.9% had received psychotropic medication for depression or panic disorder. The age of autistic individuals ranged from 20 to 35 years ($M = 25.89$, $SD = 1.71$), and the age of onset of medication ranged from 4 to 32 years ($M = 11.61$, $SD = 6.42$). Each interview lasted between 59 and 138 minutes ($M = 94.05$ mins, $SD = 24.23$). All nineteen interviews were recorded and transcribed verbatim. Constant comparative analysis (Glaser & Strauss, 1967) and emergent coding (Patton, 2002) were used to code the interview transcripts and field notes as well as to triangulate additional data sources.

Results:

The patterns of psychotropic medication use were grouped according to age at the initiation of psychotropic medication use, reasons for psychotropic medication use, effects of psychotropic medication use, dose of psychotropic medication used, and experience of psychiatric hospitalization. Experiences of psychotropic medication use were grouped based on skepticism toward the effects of medication, psychotropic medication adherence, and environmental factors. Lastly, communicating psychotropic medication use was grouped according to communication with psychiatrists, with an autistic child, and with other professionals.

Conclusions:

Once autistic individuals initiate a psychotropic medication prescription, they maintain it for a longer duration. As Rosenberg et al. (2010) mentioned, children were more likely to receive a greater dosage as they grew older. Given the higher dosages of medication at younger ages, parents were concerned about side effects (e.g., diabetes and obesity) and pessimistic about halting the medication. Consequently, Asian parents present skepticism toward taking medications (Lee, 2014). Further, limited accessibility to healthcare due to communication between healthcare providers and patients with disabilities and their families was observed. Overall, future practices are warranted for developing educational programs on medication use including foundational knowledge of medications, correct dosages, and strategies for managing side effects. Indeed, ongoing communication among stakeholders is essential. Finally, mental healthcare providers should prioritize the voices of individuals with autism, as well as team approaches based on social models.

427.055 Role of Religion in Service Access for Muslim Parents of Children with Autism

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Background: While there is a reliance on Muslim religious leaders for mental health concerns (Humam et al., 2023), the extent that Muslim parents rely on religious leaders when making decisions about their child's development has not been investigated. Furthermore, the impact of religious beliefs on decisions related to diagnosis and service access remains understudied. Specifically, research about autism in the Muslim community is relatively limited, heavily qualitative, and primarily focused on families living outside of the United States despite the population of 3.45 million Muslims in America (Hussein et al., 2019; Masri et al., 2020; Pew Research Center, 2018; Tareh et al., 2020).

Objectives: This research aims to identify the religious, etiological beliefs that Muslim parents in the United States have about autism, the support they receive from their religious community, and their beliefs in spiritual interventions. Furthermore, this project aims to identify differences in the experiences of Muslim caregivers who were born in the United States and Muslim caregivers who were born outside of the United States.

Methods: Using a descriptive approach, Muslim parents were recruited to complete surveys asking about religious beliefs about autism, knowledge of autism intervention and stigma, acculturation levels, and support from their religious organizations. Preliminary data analyses were conducted using survey results. Inclusion criteria included: Muslim caregivers of a child who had been diagnosed with autism in the United States. Fliers were sent to mosques throughout the United States and posted in relevant online groups.

Results: The current sample ($n = 24$) is composed of Muslim parents whose children received an autism diagnosis in the United States. 50% identified as Southeast Asian, 29.16% as Arab, and 20.84% as Caucasian, African American, and East Asian. The average age of diagnosis was 4.92 years ($SD = 4.33$, range = 1.5, 17). 88% of the sample did not endorse stigma, and 71% showed adequate understanding of autism intervention. Although only 27% endorsed evil eye as a potential cause of autism, 58% reported that autism could be treated through Quranic recitation. Moreover, only 18% reported becoming more active in their mosque since their child with autism was born.

Conclusions: The median age of earliest known diagnosis across 11 states in the United States is approximately 49 months (Maenner et al., 2023), which is lower than the average age of diagnosis in this study. Furthermore, some parents may seek out Quranic recitation as an intervention for their children. Together, these data suggest the need for integration of autism education and information about early intervention in the Muslim community, potentially in a religious setting such as the mosque. Further data analysis will investigate relationships between acculturation, religious beliefs, and support from religious organizations and intervention choices. Additionally, potential differences in experiences between Muslim parents born in the United States and Muslim parents born outside of the United States will be explored.

427.056 Self-Determination in Racially and Ethnically Minoritized Autistic Youth and Adults in the Transition to Adulthood: Individual Traits and Social Drivers of Health

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Background:

Self-determination, or how well individuals feel they can set and reach goals as causal agents, indicates person-environment fit and predicts post-secondary outcomes (Shogren & Shaw, 2017). Unfortunately, many U.S.-based autistic youth face poor post-secondary fit (Lai et al., 2020), especially if racially and ethnically minoritized (hereafter, minoritized) or with structural language (grammar) impairment (Johnson et al., 2010; Shogren et al., 2018). Poor fit is partly due to loss of child-/school-based services upon high school exit ("IDEIA of 2004," 2018), yet knowledge gaps remain. Autism research primarily: a) attributes outcomes to individual traits and overlooks social drivers of health (services access, sociocultural capital; Anderson et al., 2018), and b) collapses heterogeneity (using categorical labels like language impairment versus continuous scores, white-minoritized comparisons, or only caregiver report; Plaut, 2010; Schaeffer et al., 2023). Understanding self-determination requires examining social drivers of health and heterogeneity.

Objectives:

This cross-sectional study examined self-determination in minoritized transition-aged autistic individuals, asking:

1. Do social drivers of health (sense of community, unmet service needs, barriers to

services) predict Self-Determination Inventory (SDI) self-report and SDI caregiver scores, respectively, given continuous individual trait scores (language, nonverbal IQ, autism traits)?

1. Do effects differ when using a categorical approach to clinical traits (language impairment, intellectual disability, high level of autism traits)?

Methods:

Per participatory guidelines (Wallerstein & Duran, 2006), we worked with community partners (5 self-advocates, 3 caregivers, 3 speech-language pathologists, 2 psychologists, 2 teachers) and recruited 73 minoritized U.S.-based autistic participants (ages 13-30 years; 55% with language impairment; 29% NVIQ <70 to 84) and 51 caregivers. All used primarily spoken English. Participants and caregivers completed assessments using Zoom and Qualtrics. Self-determination was measured using SDI scores. Social drivers of health measures were: Brief Sense of Community Scale overall score (Peterson et al., 2008), number of unmet service needs, and number of barriers to services (Newman et al., 2011; Taylor & Henninger, 2015). Individual trait measures were: SRS-2 for autism traits (continuous: total *t*-scores, categorical: high, or ≥ 75), Raven's 2 for NVIQ (continuous: standard scores; categorical: intellectual disability, or <70), and CELF-5 core language (continuous: standard score; categorical: language impairment, or <81). Data were analyzed using descriptives and mixed-effects modeling.

Results:

SDI self-report ($M=68.6$) and SDI caregiver scores ($M=59.6$) were moderately, positively associated, $rs=.41$, $p=.003$. There were: a) small negative effects of CELF-5 language scores ($\beta=-.17$) and medium negative effects of SRS-2 total *t*-scores ($\beta=-.42$) on SDI self-report scores; and b) large negative effects of SRS-2 total *t*-scores ($\beta=-.83$) and large positive effects of sense of community ($\beta=.9.54$) on SDI caregiver scores. Using a categorical approach, there were large negative effects of high levels of autism traits ($\beta=-15.96$) and large positive effects of sense of community ($\beta=11.09$) on SDI caregiver scores. Overall, predictors differed by approach and respondent.

Conclusions:

Findings support the importance of heterogeneity in self-determination. Future work should examine the role of additional social drivers of health in self-determination and factors in caregiver-self differences.

427.057 Should Educators Prioritize Observed Employment-Related Skills or Self-Reported Attitudes? Insights from Games Made By Autistic Youth in Game Design and Employment Workshops

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Background: Autistic people are underemployed due to systemic discrimination and potential mismatches between skills, interests, and job demands (Black et al., 2020). Through iterative curricular revisions across three summers of online Game Design and Employment workshops, we sought to help Autistic youth develop skills and attitudes they can use for employment success. Computational thinking (CT), solving problems systematically using pattern matching and abstraction (Wing, 2011), is a 21st century workplace skill but is difficult to assess (Martins-Pacheco et al., 2021). Self-efficacy, easier to assess, is the focus of many projects seeking to improve employment for Autistic people.

Objectives:

1. Assess observed employment-related skills by coding video games produced by Autistic students in our workshops;
2. Examine if students' games are associated with CT scores, video game design self-efficacy, and/or engagement with workshop activities.

Methods: Masked coders used content analysis to code games produced by diverse Autistic youth in Year 1 ($n = 32$; $Mage = 16.8$) and 3 ($n = 28$; $Mage = 17.3$) workshops. Games were not coded in Year 2 as students did not use a consistent game platform. Pre- and post-test surveys assessed video game design self-efficacy, CT, and other constructs.

In Year 1, we assigned students to one of two abbreviated versions of the Computational Thinking Abilities –Middle Grades Assessment (CTA-M). In Year 3, all students completed a revised version of the abbreviated CTA-M (after removing items exhibiting ceiling effects in Year 1) and one multi-part item from Exploring Computer Science (ECS). During each workshop, students' rated their cognitive and affective engagement with select workshop activities (Figures 1 and 2).

Results: In Year 1, one version of the CTA-M had unacceptable internal consistency ($\alpha = .57$) while the other had acceptable consistency ($\alpha = .74$). The number of elements in students' games was associated with pre-test CTA-M scores and student-rated cognitive engagement with a game-making activity ($ps \leq .01$) but **not** video game design self-efficacy ($p = .38$).

In Year 3, the adapted CTA-M had acceptable internal consistency ($\alpha = .83$). The adapted ECS did not ($\alpha = .59$). Students who made games with more interactive elements and levels had higher pre-test CTA-M scores ($ps \leq .05$). Games and CT scores were again **not** associated with video game design self-efficacy ($ps > .10$). Students who reported higher cognitive engagement with self-advocacy activities made more complete games with more interactive elements, levels, and clear objectives than their less engaged peers ($ps < .04$).

Conclusions: Our findings suggest that it may be more important for educators to help students develop observable skills, like CT, and context-specific adaptations, like engagement with self-advocacy activities, than it is to focus on helping students increase self-efficacy, which is easy to measure but may lack validity and be prone to social desirability. This aligns with recommendations to help Autistic people develop an understanding of their strengths, interests and challenges to help them find jobs well-matched to their full selves (Goldfarb et al., 2019). Findings highlight the importance of learning from student-reported engagement and student-generated products.



427.058 Social Validity of a Parent Psychoeducational Program to Support Parents of Autistic Preschoolers

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Background: A growing number of evidence-based psychoeducational programs have been developed to support the needs of parents of autistic children. The Incredible Years parent program-ASLD (Webster-Stratton, 2021), is an adaptation of the program's original curriculum (IY-BASIC; Webster-Stratton, 2015) to address the specific needs of parents of young autistic children. The program's group-based, social-support-oriented structure and curriculum aims to promote parents' positive psychosocial wellbeing while preparing parents to address developmental topics such as child-directed play and self-regulation coaching. There is a need to better understand the perceptions of families with regard to the program's social validity (Meadan, et al., 2022) which could inform the program's contextual and cultural relevance when applied across different community settings.

Objectives: This study examines various indices of social-validity from a community-research partnership study of IY-ASLD.

Methods: The study included N = 58 caregivers of preschool aged children with autism or language delays with an IEP or IFSP who met criteria for autism and/or language delays who engaged in a waitlist-controlled RCT of IY-ASLD. The curriculum was implemented using a telehealth approach in 14 weekly sessions in groups of 5-8 parents. The study will report quantitative (IY-ASLD-Program Satisfaction Questionnaire) and qualitative data (open-ended questions; in-depth interview) on parents' perceptions of likes/ dislikes, perceived key benefits, and suggested program improvements. The in-depth interview addresses parents' perceptions of ecological-cultural validity.

Results:

What was the preschool community's reported need? Through a needs-assessment conducted by the community-research partnership team, caregivers reported a desire for support facilitating interactions with their children in different parenting/teaching situations (48.5%), virtual group webinars or online information sessions (44.1%), and well-being support groups for mothers and fathers (42.6%). Notably, 40% of parents reported that despite their need for parent support, barriers preventing them from participating included work schedules, childcare, and distance and/or transportation.

IY-ASLD's response to community need. The team first conducted a pilot telehealth implementation of IY-ASLD (N = 17) which provided support of the need, feasibility, and acceptability of the telehealth IY-ASLD program. Pilot data revealed that 82% of parents enjoyed the convenience of the telehealth program, 82.3% of families reported that the program was "appropriate" or "greatly appropriate" for strengthening their child's social and emotional behaviors, and 70.6% of families indicated they felt "positive" or "very positive" about the program achieving their goals for their child and family. Finally, parents rated the utility of the following aspects of the program highest: content, skills demonstrations through video vignettes, group discussions, and coaching/practice of skills. Data from these measures as well as in-depth interviews following the waitlist control RTC will be analyzed to further explore parents' perceptions of the program.

Conclusions:

Our findings demonstrate a clear need for supportive programming among caregivers of autistic children, and feedback about elements of the IY-ASLD program that can inform future iterations of the program across socio-demographic and community settings. While the preliminary findings indicate a positive experience with IY-ASLD, there was nevertheless variability in parents' experiences, which will be important to unpack from interview narratives to inform necessary adaptations.



427.059 "Engage Him First, Instead of Assuming That the Engagement Is Lacking Because of 'autism'": Themes in Clinician Identification of Effective Communication with Autistic Individuals

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Background: Autistic individuals experience heightened risk of mental health concerns, including elevated suicidality, anxiety, and depression; however, their engagement in treatment is limited. Amongst the most commonly identified barriers to accessing mental health care for autistic individuals are clinicians' lack of autism-specific knowledge and clinical competence. These factors may be exacerbated by communication barriers or missteps on the part of the clinician. While numerous training modules have been developed to educate clinicians on autism-centered communication, little work to date has examined the resulting impacts on clinician competency or knowledge.

Objectives: The present study examined clinicians' understanding of effective communication with their autistic clients following a training to deliver a safety planning intervention tailored for autistic youth (SPI-A).

Methods: Participants included 277 clinicians who work frequently with autistic individuals and completed the SPI-A training and post-training evaluation. This training was co-led by autistic community members and researchers, and included information regarding best practices for communicating with autistic individuals. The post-training evaluation involved free response prompts in response to staged videos modeling delivery of SPI-A, such as "what did the clinician do well in this section?" Data from the first six questions of the evaluation, which assessed clinician competence with autism-centered communication, were analyzed using reflexive thematic analysis (Braun & Clarke, 2022).

Results: Preliminary analysis revealed the following themes:

Respecting autistic communication styles and preferences. Many clinicians referred to the need for more direct or concrete language when interacting with autistic individuals, accommodating for potential differences in processing speed, or respecting their sensory and communication preferences (e.g., not forcing eye contact).

Actively working to foster autistic communication. Several clinicians endorsed incorporating non-verbal or visual modes of communication or ensuring sensory friendly spaces for their clients. Additionally, some clinicians suggested actively asking about communication preferences before starting SPI-A, though this was not a commonly endorsed response.

Presumption of a lack of understanding. Many clinicians' responses suggested that they believed that the video's client did not understand the content or purpose of SPI-A, despite lack of explicit indicators of confusion.

Centering neurotypical communication styles or preferences. Many clinicians suggested therapeutic tactics, coping skills, or methods of engagement that, while potentially effective for neurotypical clients, are likely not as effective for autistic clients.

Conclusions: These findings reveal that clinicians understand and can identify autism-centered communication strategies at the surface level. However, without knowing the intent behind clinicians' answers, it is unclear if these clinicians respect their clients' uniquely autistic ways of being or if their approaches continue to be colored by a neurotypical lens. Given that these potential biases persist after attending a training that extensively covered autistic-centered communication and was co-developed and co-led by autistic individuals, it is possible they are a byproduct of institutionalized ableism, rather than indicators of individual clinicians' beliefs. Future research should identify methods of enacting systemic change in the ways clinicians are taught to view and interact with autistic individuals.

427.060 Sound Sensitivity and Autistic Quality of Life

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Background:

Misophonia (sensitivity to specific sounds) and hyperacusis (decreased tolerance to sound) have previously been shown to be more prevalent in autistic adults and related to their quality of life (QoL; Scheerer et al., 2024). However, autism-related factors associated with QoL (e.g., supports/barriers, sensory challenges, friendship difficulties, being authentic/unmasking) have not been studied in relations to decreased sound tolerance (DST), despite autistic experiences with DST and QoL often diverging from the experiences of non-autistic adults (Scheerer et al., 2024; McConachie et al., 2018). Using autism-specific measures of QoL can provide insight into the effect that DST has on the well-being of autistic adults.

Objectives:

Examine the relationship between autism-specific quality of life factors and misophonia and hyperacusis.

Methods:

A total of 61 autistic adults (Mean age = 33.33, SD = 11.53; 5 non-binary, 2 gender queer, 3 transgender, 10 men, 40, women) from the community participated in an online study examining experiences with sounds and hearing, mental health, and QoL. All participants self-reported a diagnosis of autism, and completed the Autism Spectrum Quotient (AQ; Baron-Cohen et al., 2001) assessing autistic traits, Misophonia Questionnaire (MQ; Wu et al., 2014), Inventory of Hyperacusis Symptoms (IHS; Greenberg & Carlos, 2018) the World Health Organization Quality of Life–Brief (WHOQOL-BREF; WHOQoL Group, 1998), and the Autism Quality of Life Questionnaire (ASQoL; McConachie et al., 2018). The ASQoL is a 9-item addendum to the WHOQOL-BREF inquiring about factors relevant to autism (i.e., support, ability to “be yourself”, financial security, friendships, sensory issues, and barriers) on a 5-point Likert scale (Never to Always). Pearson correlations were conducted to examine the relations between autistic traits, misophonia, hyperacusis, and quality of life.

Results:

Within the sample, 55.7% and 42.7% of participants scored above the cutoff for clinical presence of hyperacusis symptoms and misophonia symptoms, respectively. Autistic traits were significantly positively correlated with hyperacusis symptoms ($r(59) = .31, p = .015$). Hyperacusis symptoms were significantly negatively associated with the ASQoL ($r(59) = -.31, p = .014$), but not misophonia symptoms. Misophonia symptoms were significantly positively correlated with hyperacusis symptoms ($r(59) = .72, p \leq .001$).

Conclusions:

Hyperacusis symptom severity, but not misophonia, was negatively correlated with the autism-specific quality of life measures. This difference resulting from the outcome of measures could be due to hyperacusis symptoms becoming more difficult to manage in a person's environment, as hyperacusis is defined by a lower tolerance for experiencing “loudness”, and everyday sounds may be hard to avoid and manage. In contrast, QoL may be associated with misophonia as triggers may be comparatively easier to avoid. Using autism-specific measures increases specificity when investigating the effect of DST on autistic adults, and also helps us understand the unique relations between QoL and DST in autistic adults.

427.061 Specifying Social Strengths: Mental Health and Demographic Correlates in Autistic Youth

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Background: A dramatically understudied dimension of strength in autistic youth is social strengths (SSs). Autism is often defined in terms of social deficits and such strengths are often ignored or even considered anathema to autism itself (see Gates et al., 2023a for review). A recently developed method that isolates SSs among broader social profiles of youth has revealed that autistic youth *do* possess SSs like their non-autistic peers (Gates et al., 2023b). However, examination of SSs while accounting for challenges, including their relative contributions to autism traits, behaviors, and mental health outcomes, and how they vary as a function of demographic differences, has never been explored.

Objectives: To examine how SSs relate to demographics, behavior, autism traits, and mental health outcomes in autistic youth; to evaluate patterns in these relationships in context of one's full profile of social challenges and strengths.

Methods: Parents of 106 autistic adolescents ($M_{age}=14.10$, 78% male) completed questionnaires as part of a study on social interaction. Alternative scoring on the SSIS (Gresham & Elliot, 2008) calculated social acquisition, performance, and strengths scores (Gresham et al., 2010; Gates et al. 2023b). SSs' correlations with mental health and behavioral outcomes, autism traits, and demographic variables were explored (see Table 1). For each significantly correlated outcome, commonality analyses (Nimon et al., 2008) were performed to tease apart the relative contributions of SSs, acquisition and performance deficits (individually, and in combination with each other) in explaining their variance.

Results: SSs negatively correlated with ODD symptoms ($p=0.002$), hyperactivity ($p<0.001$), attention problems ($p<0.001$), autism traits ($p<0.001$), and parental education ($p<0.049$). Greater SSs were reported for youth with higher social skills, Black racial identity, and by parents reporting not seeking work (p 's <0.001 ; see Table 1). All commonality models were significant overall (p 's <0.001). SSs most uniquely predicted parental education and Black racial identity (Table 2) while acquisition deficits most uniquely predicted autism traits, ODD, and hyperactivity. SSs and social performance, combined, best explained the variance in social skills as well as parental employment (Table 2).

Conclusions: Examining social strengths provides explanatory power and nuanced understanding of a variety of outcomes in autistic youth which may have been underestimated in deficit-focused research. SSs' negative associations with parent-reported ODD symptoms, hyperactivity, and autism traits emphasize SSs as a potential treatment target in youth; however, commonality analyses suggest the importance of considering SSs in conjunction with challenges when trying to impact such targets in this population. Additionally, after accounting for acquisition and performance deficits, parents of Black children, those who report not seeking employment, and those who report less formal education each reported higher levels of SSs, suggesting parents of these backgrounds may have a particular propensity for attending to the SSs – rather than deficits – of their children. Overall, results attest to the importance of better understanding how, when, and why parents observe and see value in the SSs of their autistic children. Consequently, this method may facilitate personalization of intervention to best build upon one's existing strengths and target their desired social goals.



427.062 "Everything and Nothing": Exploring the Perceived Salience of Gendered Cues at the Intersection of Autism and Gender Diversity Via Measure Validation and Analysis

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Background: Autism and gender-diverse identities often intersect, and many autistic individuals experience a unique gender identity phenotype which includes a sense of disinterest in gender as a construct. In the general population, unless gendered cues (the indicators of the various gender groups) are salient to an individual, one is not motivated to self-categorize in terms of gender. We hypothesized that autistic individuals perceive gendered cues as less salient than nonautistic individuals, which could explain why autistic individuals present with disinterest toward the utility of gender. Investigating the perceived salience of gendered cues might, therefore, help us better understand autistic gender-diverse experiences. We define gender salience as being aware of, paying attention to, and placing meaning in gendered cues.

Objectives: 1) To develop and validate a self-report measure of gender salience that is applicable across autistic and nonautistic adults and cisgender and gender-diverse adults, with two versions, present-day and retrospective at age 10-13 years; 2) To investigate how levels of gender salience differ in accordance with autism-status, gender diversity-status, and sex-assigned-at-birth.

Methods: Working with a group of six autistic, gender-diverse individuals, we developed a set of self-report items to capture gender salience. Data were collected via Prolific for autistic-gender-diverse ($n = 484$), autistic-cisgender ($n = 469$), nonautistic-gender-diverse ($n = 358$), and nonautistic-cisgender ($n = 523$) adults. Participants responded according to present-day and retrospective experiences. A series of exploratory factor analyses (EFA) were first performed on the present-day data to select robust items, and a confirmatory factor analysis (CFA) then performed on the retrospective data. The alignment method was used to examine measurement invariance across autism-status, gender diversity-status, and sex-assigned-at-birth groups. We then used multivariate hierarchical regression to investigate the effects of autism-status, gender diversity-status, and sex-assigned-at-birth, alongside their interactions on gender salience factor scores as three dependent variables, for each timepoint.

Results: Three factors were identified via the EFAs, including 16 items explaining 53.8% of total variance (Table 1). The factors were named Gender Awareness, Gender Categorization, and Gender Rumination. The CFA on retrospective items indicated good model fit. The measurement invariance testing indicated 9.38% noninvariance in the present-day data and 3.13% noninvariance in the retrospective data, suggestive of measurement invariance. Being autistic ($p = .002$) and being gender-diverse ($p < .001$) were associated with higher present-day gender salience scores (indicating higher levels of perceived salience of gendered cues) on the omnibus tests. Being autistic ($p = .003$), gender-diverse ($p < .001$), and assigned-female-at-birth ($p = .003$) were associated with higher retrospective gender salience scores on the omnibus tests. See Table 2.

Conclusions: One explanation for greater gender salience is that those who have most actively thought about gender rules to fit in (i.e., gender-diverse, autistic, or assigned-female-at-birth people) are more likely to have greater gender salience. Following a Bayesian explanation of autistic cognition, priors of traditional gendered constructs might be attenuated for autistic individuals, leading to reduced adaptation to gendered cues and thus subjective greater salience. The findings inform a “difference-and-not-delay” framework of the development of autistic gender identity experiences.



427.063 Stress and Coping Experienced By Mothers with Autoimmune Diseases While Parenting Children with Autism

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Background: The number of individuals diagnosed with autoimmune diseases (AD) continues to rise with the majority being women of childbearing age. Quantitative studies regarding the effect of the maternal immune system on the developing fetus have shown an increase in both pregnancy and birth complications for women with ADs and a higher incidence of both AD and autism in children born to mothers with ADs.

Individuals with ADs report increased emotional, medical, and financial burdens resulting from symptoms associated with their AD.

There has been a concurrent increase in the number of children diagnosed with autism and mothers are often the primary caretaker. AD and autism have been researched separately through quantitative studies with similarities regarding potential etiology and heritability. The gap identified in the literature was the need for qualitative study regarding stress and coping among mothers with AD parenting children with autism.

Objectives: The purpose of this qualitative study was to understand the stress and coping experiences of mothers with AD while parenting children with autism. We used the transactional model of stress and coping as the conceptual framework for this study to understand what was needed to support these mothers in parenting their children.

Methods: Inclusion criteria for this study required mothers between 30 and 60 years of age diagnosed with one or more AD's, parenting a child diagnosed with autism between the ages of three and 18. Semi structured interviews were conducted with 10 mothers with ADs aged 35 to 52 parenting children with autism. Interviews were conducted virtually on a secure platform and audio recorded with consent. Recordings were securely stored and reviewed repeatedly for line-by-line transcription, coding, and theme development for thematic analysis.

Results: We identified 11 themes including delayed AD diagnosis, delayed autism diagnosis, chronic pain and fatigue, time management, challenging autism concerns, lack of resources, bidirectional stress, relationship issues, school issues, emotional cost, financial cost, and judgement from others. Symptoms associated with ADs were reported to create barriers at times to caring for their children. When their child experienced emotional dysregulation resulting in increased behaviors, this increased the mother's emotional burden and AD symptoms. Mothers reported using coping strategies including managing their diet, seeking social supports, pacing and planning daily activities, and time for rest. Engaging in their own therapies and adhering to sleep routines were reported to be beneficial. These mothers emphasized the need for medical practitioners, school staff, family members, and people in their communities to listen to them regarding symptoms and needed supports for themselves and their children.

Conclusions: Comprehensive education for medical professionals is needed regarding ADs to allow for faster identification and provision of supports and services. Recognizing ADs in pregnant mothers may provide support for the mother and child while the child is still in utero. Comprehensive education for medical and school professionals is needed regarding autism supports. Practitioners and school systems would benefit from creating collaborative, whole family approaches that may lead to better patient outcomes, and stress reduction for mother and child.

427.064 Supporting Families: Insights into the Transition Experience for Parents Whose Autistic Child Is Moving to an Independent Living Setting

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Background: An increasing number of autistic adults are seeking independent living arrangements, as many continue to live with their aging parents. The transition from the family home for an autistic adult who is unable to live independently is a significant event for their families (Longtin, Soulières, Gagné, & Lapointe, 2017). This change represents a major disruption to family dynamics, requiring parents to adapt to a new reality (McNavish, 2019). Consequently, this transition raises important questions about how parents experience and cope with this adjustment. The Véro and Louis Foundation opened an autism-specifically designed group home environment in Canada, housing 16 residents. In order to better meet the needs of families whose children are moving to the Véro and Louis House, the research team investigated their transition experience.

Objectives: The aim of this research is to describe the experience of parents following the move of their child from the family home to a suitable living environment for autistic adults.

Methods: To understand the experience of parents, we conducted semi-structured interviews, which were recorded and subsequently transcribed. The sample consisted of 3 couples who participated in the interview together and 11 parents who had individual interviews. We employed a thematic analysis approach (Braun & Clarke, 2021). The interviews were first analyzed inductively to identify themes and patterns, and then deductively to confirm categories and to closely examine cases that did not align with the overall analysis (Patton, 2015).

Results: The results address their thoughts, emotions, and experiences before the move to the new home and during the transition period, as well as the information received about the house program before, during, and after their child's move. Six themes emerged from the analysis: perception of the child's well-being, quality of interventions by practitioners, frequency and modalities of communication with the child, quality of interactions between parents and practitioners, overall satisfaction with the new living environment, and the significance of parental involvement in the child's intervention plan.

Conclusions: The results highlight that the child's well-being is central to parental concerns, as it serves as a measure of the quality of the transition. The relationships established between parents and practitioners significantly influence their levels of stress or comfort regarding the move to the new living arrangement. This study emphasizes the importance of considering the realities of parents during the relocation of their autistic child, as they are significant actors in their child's life. A key aspect of supporting the transition is to promote the continuity of the relationship between the parent and their child, as well as with practitioners. Consequently, practitioners must involve parents in decision-making processes regarding their child to maintain the quality of the relationship.

427.065 Supporting Rural Families: Outcomes of a Virtual Parent Support Program

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Background: Parenting stress among caregivers of autistic children negatively impacts child adjustment and contributes to the risk of adverse outcomes. These caregivers often experienced elevated stress associated with the demands of navigating extensive supports and interventions. Understandably, this stress is exacerbated in rural, under-resourced areas where access to healthcare, support services, and community resources is limited. In the southeastern US, many regions lack specialized programs and services, leaving caregivers with minimal opportunities to access support networks. For many families, barriers like transportation, childcare, and financial resource further limit their ability to access the few resources that exist. Thus, parents in these regions are tasked with navigating not only the needs of an autistic child but with doing so in the absence of supportive services. This dearth of resources is concerning for ongoing disparities in low-income, rural, and/or minority families of autistic children. The needs of these families in the face of such barriers necessitates innovative approaches to providing resources to autistic children and their caregivers.

Objectives: This study examined the effectiveness of an 8-week parent support and psychoeducation group delivered via telehealth throughout the rural southeastern US. The goals of the program were to decrease parenting stress and enhance parents' perceived social support and satisfaction in the parent-child relationship. We also examined parent- and child-related factors that influenced response to intervention.

Methods: The intervention was based on a semi-structured curriculum that was administered virtually for 8 consecutive weeks. Each session included a hybrid approach involving the provision of didactic information and a semi-structured, facilitated support group model. Variables of interest were measured before and after the intervention. Data collection throughout a follow-up period is ongoing. Variables of interest included parenting stress, perceived social support, and satisfaction in the parent-child relationship. We also assessed the broad autism phenotype (BAP) in parents and child-related factors (i.e., autism symptom severity, internalizing and externalizing problems) as factors influencing response to intervention.

Results: Participants ($n=43$) included mothers (80.9%) and fathers of autistic children (M age = 9.30; $SD = 4.30$) who participated in the intervention. At baseline, BAP traits in parents were positively associated with satisfaction in the parent-child relationship ($r = .54, p < .01$). Parenting stress was negatively associated with perceived social support ($r = -.56; p < .01$). Outcomes were analyzed for participants who completed at least 6/8 sessions ($n=35$). Child age was the only significant predictor of attrition. Results of an ANCOVA showed a significant increase in perceived social support post-intervention after controlling for child age and autism symptom severity ($F[1,34]=20.15, p < .01$). An increase in satisfaction in the parent-child relationship approached significance.

Conclusions: Social support can be difficult for parents of autistic children to access, yet it is known to mitigate parenting stress and to enhance overall wellbeing in parents. In rural areas, garnering social support can be particularly challenging. This study shows that a virtual parent education and support program is effective for increasing parents' perceived social support, which represents a meaningful way by which providers in under-resourced areas can support families of autistic children.

427.067 "They Believed in Me": A Community-Partnered Participatory Study Exploring the Outcomes of Adult AAC Users

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Background: In 2020, around five million Americans and 97 million people globally used or could benefit from AAC (Beukelman & Light, 2020). Research on AAC users, especially those with autism and intellectual and developmental disabilities (I/DD), is limited and mostly focused on young children. This study aims to explore the outcomes, transitions, and special education experiences of AAC users with autism and/or intellectual disabilities through a multiple-case study approach.

Objectives: The study aims to explore the outcomes, transitions, diagnoses, communication, and special education experiences of AAC users with autism and/or intellectual disabilities. Using community-partnered participatory methods involves interviews with AAC users, parents, educational history questionnaires, and quality of life and self-determination measures. The research seeks to understand what AAC users consider fulfilling and successful outcomes, challenging traditional perspectives. Grounded in the social model of disability, it aims to provide insights into the unique needs and experiences of AAC users, contributing to the limited knowledge about their outcomes and informing future research and practice.

Methods: This study uses a community-partnered participatory research (CPPR) approach to conduct multiple case study research on AAC users with I/DD who qualified for special education under autism and/or intellectual disability. After a lengthy recruitment process, three participants qualified and participated. Data collection methods included interviews, questionnaires, surveys, and document reviews. The analysis involved within-case and cross-case phases (Creswell, 2018) using QCAmap software for qualitative content analysis (Mayring, 2021). CPPR fosters trust, mutual respect, and shared decision-making, ensuring relevance and benefit to the community. The study's three CPPR phases were vision (goal setting and design), valley (data collection and analysis), and victory (dissemination of findings) (Jones et al., 2009) were done in collaboration with a team of community stakeholders who are fellow authors on this presentation.

Results: The within-case and cross-case analyses revealed that friendships were a strength for all three participants (see table and figure below). Communication was a strength for Billy and Jessica but a challenge for Emma. Day programs provided social and academic support for Jessica and Emma. All participants lived with their parents, relying on them for support. Employment was a strength for Billy and Emma. Participants continued to grow in adulthood, with high quality of life scores. Self-determination was an area for growth. Talents like running, dancing, and swimming helped them connect with others. Good outcomes included being loved, included, respected, and having continued support.

Conclusions: This study emphasizes the importance of understanding AAC users' outcomes, particularly those with autism and intellectual and developmental disabilities. The study addresses community-specific needs by involving stakeholders and individuals with lived experience in the research process. Key findings highlight the necessity of providing ongoing support and training for day programs, employers, and job coaches. The research underscores the need for tailored educational strategies and policy changes to improve service delivery. It also identifies barriers such as lack of awareness and access to specialists, advocating for better support across the lifespan for AAC users. This study serves as a foundation for future research and practice improvements.



427.068 Teachers' Knowledge, Beliefs, Experiences, and Needs in Sex Education for Autistic Students with Intellectual Disabilities in China

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Background:

School-based sex education (SBSE) is crucial for sexual health and safety for all students. In China, there is a significant lack of SBSE for students with disabilities. Special education teachers are key to developing and delivering SBSE specifically tailored to students' needs. Although some studies suggest a growing awareness of SBSE among special educators, little research has examined their knowledge, beliefs, experiences, and needs in providing SBSE for autistic students with intellectual disabilities.

Objectives:

Phase 1 involved a survey investigating 51 special education teachers' knowledge of sexual and reproductive health (SRH) and beliefs about SBSE. Phase 2 involved focus groups with 17 participants from Phase 1, exploring teachers' experiences and needs for SBSE for autistic students with intellectual disabilities.

Methods:*Phase 1*

Fifty-one special education teachers recruited via online teacher groups completed an online survey on SRH knowledge and beliefs. The knowledge section covered categories in physiological health, sexually transmitted diseases, conception, and sexual violence. The belief section asked questions regarding importance, timing, and self-competency in delivering SBSE. Descriptive statistics were generated using SPSS.

Phase 2

Participants were selected from Phase 1 based on student grade level and school locations. Thus, 17 teachers participated in three focus groups, each with five to six participants. Two-hour interviews explored teachers' experiences delivering SBSE and the need for SBSE. Transcriptions were analyzed using NVivo, employing thematic analysis to identify themes.

Results:*Phase 1*

Knowledge: The participants demonstrated an overall high knowledge level (Mean = 26/30). However, knowledge level varies across categories such as conception.

Belief: Nearly all teachers (98%) agreed SBSE is essential and should be tailored for autistic students with intellectual disabilities. Over 75% believed elementary school is the best time to introduce SBSE. Around 90% supported involving caregivers and professionals in developing SBSE, though fewer (55%) endorsed the involvement of school administrators or government entities. While 98% recognized teachers' key role in improving students' sexual health, only half felt confident in delivering SBSE.

Phase 2

Three themes emerged from focus groups: 1) current state of SBSE, 2) barriers to delivering SBSE, and (3) desired content and format of ideal SBSE.

Experience: Teachers reported gaps in current state of SBSE at student, school, and teacher levels. Barriers are shared regarding student needs, teacher training, school support, caregiver collaboration, and cultural taboos.

Need: Teachers identified three key content areas for SBSE in physical knowledge, psychological support, and safety protection. Teachers also highlighted needs in format for clear and direct content delivery, multi-sensory teaching methods, as well as teacher support and guidance.

Conclusions:

Autistic students with intellectual disabilities are at significant risk of sexual violence and exploitation due to the absence of SBSE. Special education teachers may acquire relatively high SRH knowledge levels and recognize SBSE's importance, but are confronted with multiple implementation barriers. Their insights on content and format of SBSE provided a foundation for future development of SBSE tailored to these students' needs.



427.069 The Enduring Differential Impact of Family Resources and Needs on the Strengths of Children with Intellectual and Developmental Delay: A Longitudinal Study of the Family Advocacy and Support Tool

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Background:

Considerable effort has been spent assessing the predictors of positive long-term outcomes for children on the autism spectrum and with intellectual and developmental delays (DD). However, the role of family and caregiver resources and needs in supporting children with DD and profound autism is less understood. A lack of comprehensive community or public support programs for families and caregivers of children with DD may lead to prolonged parental caregiving obligations as well as a disproportionate need to play a more active role in supporting their children. Drawing on our lived experiences as family members of individuals with profound autism, we examined whether family needs and resources may be differentially impactful for promoting strengths of DD children.

Objectives:

To (1) center our lived experiences as family members of individuals with profound autism; (2) assess whether the impact of family resources and needs on child strengths is moderated by DD; (3) examine its enduring differential impact across 24 months.

Methods:

This study utilized Family Advocacy and Support Tool (FAST) survey assessments ($N=165,011$) from families ($n=27,086$), caregivers ($n=54,264$), and children ($n=59,775$) with DD ($n=3,817$) and without DD ($n=55,958$) conducted by Child Protective Services (CPS) during hotline calls and follow-up visits across 24 months. Children were between 1 to 21 years old (5 or younger: 33.8%, 6-10: 28.0%, 11-15: 27.6%, 16-21: 10.6%) with diverse racial backgrounds (White: 48.6%, Black: 37.8%, Other: 13.6%). A total family/caregiver wellness score (FCW) at baseline was calculated from the FAST items to reflect having fewer needs and more resources. Generalized models were used to assess the moderating effect of DD, controlling for age and race, and accounting for the repetitive, nested nature of the data (see Table 1 and Figure 1).

Results:

Higher baseline FCW was more strongly associated with baseline child strength in DD children relative to non-DD children ($p=0.003$). In non-DD children, baseline child strength was 0.531 higher per unit increase in baseline FCW score ($p<0.001$). For DD children, the increment was 0.650 ($p<0.001$). Baseline FCW also had an enduring differential impact on child strength over 24 months moderated by DD. Higher baseline FCW was associated more strongly with DD child strength relative to non-DD children 6 months later ($p<0.001$), 12 months later ($p<0.001$), 18 months later ($p=0.001$), and 24 months later ($p=0.003$).

Conclusions:

Our results demonstrate an enduring differential impact of FCW on strengths of children with DD and suggest the importance of focusing resource allocation on family engagement. DD children consistently showed more benefit in their strength development from baseline family wellness than non-DD children, suggesting families with fewer unmet needs may play a more active role in promoting DD child strengths. Results also mirror our collective lived experiences, which support the notion of a disproportionate effect of FCW on DD children compared to non-DD children. Practice and policy efforts aimed at building strengths among DD children should focus on identifying and addressing the needs of families. Centering the lived experiences of the family will help bridge the existing research, practice, and policy gap.



427.070 The Impact of Coping on the Mental Health of Mothers of Children with Autism Spectrum Disorder, Children with Other Disabilities, and Typically Developing Children in Japan

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Background:

Coping strategies are crucial to how families manage stress, especially to families of a child with Autism Spectrum Disorder (ASD) (Benson, 2010). Problem-focused coping is associated with better mental health, while avoidance-oriented coping is associated with poorer outcomes (Dabrowska & Pisula, 2010). However, it is unclear if coping strategies effective for families of typically developing children (TD) or families of those with other disabilities (OD) are equally effective for parents of children with ASD.

Objectives:

This study examined coping strategies used by mothers of children with ASD, OD, and TD in Japan, and to compare how these strategies impacted mothers' mental health.

Methods:

One hundred fifty-nine mothers of children with ASD, 88 with OD, and 172 with TD, aged 2 to 12 participated. Average age of children was 94.83 ± 37.91 months for ASD, 93.75 ± 36.02 for OD, and 76.67 ± 31.76 for TD. Socioeconomic status (SES) was calculated using an index based on the mother's education, occupation, and family income. Participants completed online surveys using Japanese versions of the Brief COPE (Engagement, Disengagement, Distraction, Cognitive reframing), WHO Well-Being Index (WHO-5), and Kessler Psychological Distress Scale (K10) to assess maternal characteristics, and the Social Communication Questionnaire (SCQ) and Strengths and Difficulties Questionnaire (SDQ) for child characteristics, along with life stress (LS). ANOVA was used to examine differences in psychological well-being and effects of coping strategies across the three groups. Multiple Group Path Analysis was used with SCQ, SDQ, and LS as observed variables, controlling for child age and SES, to explore how coping strategies influenced well-being across groups.

Results:

Disengagement coping was significantly higher in the TD group compared to the OD group ($p < .001$) (Figure 1). In the multiple-group simultaneous analysis, after examining the model without equality constraints, we analyzed the model with equality constraints on paths with significant and non-significant and positive and negative path coefficients in any group (Figure 2). The resulting model fit indices were adequate (CFI = .85, RMSEA = .05, AIC = 810.85, and BCC = 888.99). Key findings in the model without equality constraints included significant positive paths from SCQ to Disengagement in the ASD and TD groups ($\beta = .18$; $\beta = .19$). Additionally, Cognitive Reframing negatively predicted K-10 in the ASD and OD groups ($\beta = -.22$; $\beta = -.40$), while Distraction positively predicted K10 in the ASD and TD groups ($\beta = .15$; $\beta = .21$).

Conclusions:

Disengagement coping was positively associated with social communication difficulties (SCQ), suggesting mothers of children with stronger ASD traits may be more likely to use less adaptive coping strategies. Interventions should aim to reduce disengagement coping and promote active coping in this group. Cognitive reframing emerged as a significant protective factor in the ASD group. Fostering cognitive reframing skills could be particularly beneficial in alleviating distress among these mothers.

**427.071 The Impact of Environmental Factors on Autistic Young People's Mental Health**

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Background: Autistic people experience high rates of depression and anxiety and this can have a detrimental impact on their lives. An evidence-based understanding of how and why these difficulties develop in childhood and adolescence is lacking, leading to a paucity of evidence to inform the development of much needed mental health support for autistic people. In particular, there is a lack of research into how autistic young people's social and physical environment influences their mental health. Greater research is needed into these environmental factors as they are likely to impact heavily on mental health, and many such factors may be amenable to modification and therefore important targets for intervention.

Objectives: To better understand why autistic young people commonly develop anxiety and depression, and to identify potentially modifiable environmental factors that can form targets for intervention.

Methods: Given the study's focus on lived experience, a qualitative approach was taken. This approach allowed the amplification of autistic young people's voices, who are seldom heard in research. Semi-structured qualitative interviews were conducted with 23 parents and 14 young people (mean age 11.70 years (range 5-17); 13 males, 10 females, 1 non-binary; 19 white, 5 belonging to an ethnic minority). Interviews are due to be conducted with 50 participants (20 young people, 30 parents) in total. Interviews were analysed using Framework Analysis. An analytic framework was created drawing upon categories of environmental variables known to impact mental health, underpinned by Bronfenbrenner's ecological systems theory. Transcripts were coded by multiple coders. The study was conducted in collaboration with autistic young people and other stakeholders.

Results: Nature, trajectory and impact: Internalising issues were a significant and daily challenge for many, with issues often increasing in severity with age and leading to isolation and sometimes debilitating difficulties completing daily activities. **Family relationships:** Supportive and understanding family members were a key protective factor, with young people valuing family who facilitated a positive sense of their autistic identity. Parents described modifying their parenting to lower demands and boost their child's autonomy and thereby ease their anxiety. **Social and academic environment outside the home:** School often represented a deeply pressurising environment and school refusal was common. The weight of academic expectations was a significant source of stress, as were difficulties with peers by whom young people commonly felt misunderstood and victimised. Young people often internalised these stressors, impacting their sense of self-worth and leading to exhaustion and burnout while attempting to meet others' social and academic expectations. **Physical environment:** Access to greenspaces represented an important protective factor, facilitating emotion regulation. Young people described the importance of safe spaces, most often their bedroom, in which they could control their sensory environment and engage in their passions and interests.

Conclusions: Autistic young people face significant internalising issues, often as a result of unaccommodating environments and pressure to meet neurotypical expectations. Environmental factors such as academic expectations, parenting styles, understanding of autism among family, teachers and peers, and access to low sensory demand spaces may be important targets for mental health interventions.

427.072 The Impact of Visible and Invisible Stigmatized Identities on the Transition to Adulthood: Qualitative Perspectives of Autistic Young Adults, Caregivers, and Service Providers

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Background: The transition to adulthood for autistic adolescents and young adults (AYAs) is a crucial period marked by a paucity of adult services and AYAs' unique vulnerability to discrimination and disempowerment as a societally stigmatized group. Few studies have explored how discrimination due to different forms of stigmatization can impede transition-related goals as families prepare for AYAs to navigate the world with increased independence. Stigmatization can occur due to visible or readily apparent socially devalued characteristics (i.e., race) and invisible or concealable identities (e.g., autism) that may become consequential through perception or disclosure (Turnock et al., 2022). AYAs and caregivers from marginalized backgrounds often must navigate both visible and concealable stigmatized identities throughout the transition process, especially in the context of encountering potential discrimination. Understanding how families manage stigmatizing experiences is necessary to improve transition outcomes.

Objectives: This qualitative study sought to (1) explore how AYAs and caregivers navigate experiences of discrimination due to visible and invisible stigmatized identities, and (2) examine how these experiences pose additional challenges for families during the transition to adulthood.

Methods: English, Mandarin, and Cantonese-speaking autistic AYAs ($N=8$, 14–22-year-old), caregivers ($N=22$), and service providers ($N=5$) participated in individual semi-structured interviews. Interviews explored experiences of AYAs and caregivers during the transition to adulthood, with particular attention to barriers related to experiences of discrimination, service provision, and resource access. Data collection continued until thematic saturation was achieved. Data were transcribed verbatim, cleaned, and systematically coded, then organized conceptually using framework matrices. Data were further analyzed using applied thematic analysis.

Results: Three primary themes were identified. First, AYAs and caregivers encounter barriers in the transition process related to their visible and invisible identities, with those who exist at the intersection of multiple stigmatized identities experiencing additional, unique barriers. Second, due to the increasing threat of discrimination, caregivers attempt to protect and prepare AYAs for success in navigating the world with increased autonomy. Third, there is variability in the decision-making process regarding concealing or disclosing AYAs' autism diagnosis. The decision maker weighs the costs and benefits of disclosure or concealment depending on the specific social context. To illustrate, Black caregivers and AYAs consider preemptive autism disclosure in encounters with law enforcement due to the increased risk of adverse or life-threatening outcomes. In contrast, there are situations wherein it may be advantageous to conceal autism, which stems from a fear of discrimination, e.g., on college applications.

Conclusions: Understanding how AYAs and caregivers navigate discrimination due to visible and invisible stigmatized identities during the transition process is crucial to mitigating resulting barriers. This is especially true for AYAs and caregivers from marginalized racial, ethnic, and cultural backgrounds with intersecting stigmatized identities. Discrimination-related challenges can limit the environments AYAs can independently navigate. This study identifies the identity concealment or disclosure process as a significant experience during the transition period that warrants deliberate consideration for families. Future research should examine how systems can help families navigate the cultural and social implications of the transition to adulthood and improve outcomes for AYAs and caregivers.



427.073 The Mediating Role of Psychological Capital in the Relationship between Family Sense of Coherence and Caregiver Stress Among Parents of Children with Autism Spectrum Disorder

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Background: Caregiving for children with autism spectrum disorder (ASD) is a challenging role that often imposes a significant psychological and emotional burden on parents. The stress experienced by these caregivers can arise from various sources, including the high demands of caregiving, family-related concerns, and financial strains. As children with ASD often require specialized care and support, caregivers frequently face difficulties in managing the associated responsibilities, leading to elevated stress levels. Furthermore, the unique behavioral, social, and communication challenges presented by children with ASD can exacerbate feelings of frustration and helplessness among caregivers. Therefore, understanding the factors that can mitigate caregiver stress is of paramount importance to enhancing the well-being of these individuals. Previous studies have identified that psychological resources, such as resilience, hope, optimism, and self-efficacy, play a pivotal role in reducing stress levels among caregivers. Psychological Capital, which encompasses these four key dimensions, has been shown to buffer against stress and improve mental health outcomes. Additionally, the concept of Family Sense of Coherence, which refers to the family's ability to perceive life events as comprehensible, manageable, and meaningful, has been associated with positive mental health and reduced stress in various caregiving contexts. However, limited research has explored the combined impact of these two constructs—Family Sense of Coherence and Psychological Capital—on caregiver stress, particularly in the context of caring for children with ASD.

Objectives: This study investigates the interplay between Family Sense of Coherence, Psychological Capital and caregiver stress in this context.

Methods: A total of 205 caregivers of children with ASD participated in this cross-sectional study. Data were collected on Family Sense of coherence, Psychological Capital (encompassing hope, resilience, optimism and self-efficacy) and caregiver stress. Structural equation modelling was employed to test the mediation effect of psychological capital between family sense of coherence and caregiver stress.

Results: The results indicated a strong positive correlation between family sense of coherence and all subdomains of psychological capital, with coefficients ranging from 0.541 to 0.610. Conversely, psychological capital demonstrated significant negative correlations with various domains of the Kingstone Caregiver Stress Scale, including caregiving, family issues and financial issues (coefficients from -0.443 to -0.427). Furthermore, family sense of coherence showed a direct negative effect on stress ($\beta = -0.384, p < 0.001$). Notably, the study revealed a significant mediating role of psychological capital in the relationship between family sense of coherence and caregiver stress, with an indirect effect of family sense of coherence on stress through psychological capital ($\beta = -0.127$). The findings underscore the crucial role of family sense of coherence and psychological capital in enhancing psychological resources and mitigating stress among caregivers of children with ASD.

Conclusions: These results suggest that interventions aimed at strengthening family coherence and building psychological capital could be effective strategies in alleviating stress among caregivers of children with ASD. Healthcare professionals should consider incorporating family coherence approaches and psychological capital techniques in their support programs for these caregivers.

427.074 The Relationship between Early Child Temperament and Parenting Stress in Young Children with Autism Spectrum Disorder: Changes over a 12-Month Period

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Background: Autism Spectrum Disorder (ASD) is a highly heterogeneous neurodevelopmental condition, and parents of children with ASD often experience elevated levels of parenting stress, which can vary based on the severity of symptoms and children's developmental level. While temperamental factors are recognized as important contributors to individual differences and influences on parenting stress in typically developing children from an early age, research on parenting stress in ASD has rarely explored the impact of early child temperament, particularly in longitudinal studies. Understanding these factors could inform interventions and support for families.

Objectives: This study aims to examine changes in the relationship between early child temperament and child-related parenting stress in young children with ASD over 12 months, while controlling for children's developmental level and ASD symptom severity.

Methods: A total of 35 young children with ASD (mean age = 34.40 months) and their parents participated. Data were collected at three timepoints (T1, T2, and T3) over two 6-month intervals. Early child temperament (negative affectivity, effortful control, surgency/extraversion) was assessed at T1 using the Early Childhood Behavior Questionnaire (ECBQ), and child-related parenting stress was measured at all timepoints using the Parenting Stress Index, Third Edition (PSI-3). Children's developmental level (developmental quotient [DQ]) was assessed at all timepoints using the Mullen Scales of Early Learning (MSEL), and ASD symptom severity (calibrated severity score social affect [CSS-SA] and restricted and repetitive behaviors [CSS-RRB]) was measured at all timepoints using the Autism Diagnostic Observation Schedule (ADOS). Hierarchical regression analyses assessed the contributions of child temperament to parenting stress over time.

Results: After controlling for developmental level and ASD symptom severity, hierarchical regression revealed that at T1, both DQ and negative affectivity significantly predicted parenting stress ($p = .026$ and $.004$, respectively), with temperament variables accounting for 24% of the variance (Step 1, $R^2 = .241, p = .034$; Step 2, $\Delta R^2 = .238, p = .013$). At T2, negative affectivity was the sole significant predictor of parenting stress ($p = .005$), with temperament variables contributing 32% of the variance (Step 1, $R^2 = .064, p = .555$; Step 2, $\Delta R^2 = .323, p = .007$). At T3, both CSS-RRB and negative affectivity significantly predicted parenting stress ($p = .018$ and $p < .001$, respectively), with temperament variables accounting for 38% of the variance (Step 1, $R^2 = .168, p = .121$; Step 2, $\Delta R^2 = .375, p = .001$).

Conclusions: This study underscores the importance of considering child temperament in understanding parenting stress among parents of young children with ASD. The findings reveal a growing influence of temperament on parenting stress over time and indicate a consistent impact of emotion-regulation-related aspects of temperament on parenting stress, independent of developmental level and ASD symptom severity. Moreover, factors affecting parenting stress may change over time: initially, parents may be more concerned with developmental delays, while later stress may stem more from children's restricted and repetitive behaviors. Targeted interventions that consider temperament and adapt to evolving concerns are needed to better support families of young children with ASD.

427.075 The Relationship between Parental Self-Efficacy and Parent-Child Relationships: The Moderating Roles of Family-Based Factors

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Background: It is challenging for parents to establish and maintain positive relationships with their autistic children (e.g., McDaniel, 2005), which is important for the children's developmental competence. Since parent-child relationships (PCR) are influenced by parental self-efficacy (PSE) in families with neurotypical children (Coleman and Karraker, 1998), it is crucial to understand how PSE influences the parent-child relationships PCR in autism families, given that parents play a crucial role in training their autistic children. Yet, such issue is understudied in the literature. Additionally, through identifying the protective and risk factors moderating the relationship between PSE and PCR, therapists would have better ideas which families would have a higher risk of having relatively poor PCR at a certain level of PSE.

Objectives:

The present study aimed to investigate the relationship between PSE and PCR, and more importantly, the potential protective factors and risk factors that could moderate such relationship. Given family is viewed as a system composed of interrelated parts (e.g., main caregiver, spouse, children; Bowen, 1978), the potential moderators were autistic children's behavioral problems, parent's endorsement of stigma toward autism, and the support provided by the parent's spouse. We hypothesized that PSE would be positively associated with PCR (H1) and risk factors (behavioral problems and endorsement of stigma) would weaken the PSE's impact of on PCR, while protective factors (spouse support) would strengthen it (H2).

Methods:

A community sample of Chinese caregivers of autistic children (N=198; 180 mothers; mean age=40.23, SD=6.49; median income=USD3750-6250) who were attending routine parent and child interventions participated. Their children's (mean age=6.43, SD=2.17; male-to-female ratio 3.21:1) autism diagnoses were confirmed. Caregivers completed the Chinese Versions of the Parenting Sense of Competence Scale (C-PSOC; Yang et al., 2014), Child-Parent Relationship Scale (CPRS; Zhang & Chen, 2010), Endorsement of Autism Stigma (KAS-C; Yu et al., 2020), Conners Parent Symptom Questionnaire, Chinese Version (PSQ-C; Su et al., 2001), and Experiences in Close Relationship Scale (ECR-CS; Zhao & Hao, 2019).

Results:

All variables were centered. Each model had PSE, the predictor, PCR, the criterion variable, and a hypothesized moderator. PSE significantly and positively predicted PCR ($ps < .001$). Behavioral problems (conduct problems, impulsivity-hyperactivity, hyperactivity) negatively predicted PCR, $Bs \geq -.38$, $SEs \geq .10$, $ps < .0003$ while lack of endorsement of autism stigma positively predicted PCR, $B = 1.75$, $SE = .56$, $p < .002$. Only the interactions of PSE and behavioral problems (psychosomatic problems¹) and lack of endorsement of autism stigma² were statistically significant (¹ $B = -.08$, $SE = .02$, $p < .001$; ² $B = .11$, $SE = .05$, $p < .04$). Figures 1 and 2 show the patterns. PSE and PCR relationship was weakened when there were more psychosomatic problems. In contrast, the relationship between these two variables was strengthened when parents tended not to endorse the autism stigma.

Conclusions: Our first hypothesis was supported, and second hypothesis partially supported. Chinese parents' lack of endorsement of autism stigma appears to serve a protective role for parent-child relationships, while autistic children's psychosomatic problems serve as a risk factor. Toward that end, our study reveals important avenues for supporting Chinese parents of autistic children, such as delivering an intervention for helping them understand autism and accept their children.



427.076 The Role of Burnout on Early Intervention Providers' Self-Efficacy Delivering Evidence-Based Parent-Mediated Interventions

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Background:

Part C Early Intervention (EI) systems serve a large number of toddlers with or at high likelihood of autism. Although EI systems provide a critical access point to services and have been a focal point of implementation efforts, intervention quality is variable.¹ Early intervention quality may be driven by providers' varied backgrounds and experiences,² in addition to turnover and other internal challenges, such as emotional exhaustion^{3,4} and burnout.^{3,4} However, limited work has been conducted on the role of burnout in providers within early autism intervention service systems. Our study attempts to bridge this gap by examining factors that drive EI provider burnout and the impact of burnout on the implementation of an evidence-based parent-mediated intervention, Project ImPACT.⁵

Objectives:

- (1) How do provider characteristics and support systems predict EI provider burnout?
- (2) How does EI provider burnout relate to their self-efficacy delivering Project ImPACT?

Methods:

Preliminary data from the current study comes from an ongoing contract with Georgia's Department of Public Health and Part C system. Sixty-nine participating EI providers were trained in Project ImPACT, an evidence-based parent-mediated intervention supporting social communication skills in toddlers with autism.⁵ Prior to training, providers completed measures of (1) demographic characteristics, including years of experience in the EI field and age, (2) providers' sense of cohesion⁸ and organization support,⁹ and (3) burnout and strain.⁶ Post training, providers completed measures of (1) their self-efficacy delivering Project ImPACT⁵ and (2) their attitudes towards Project ImPACT.⁷ Research staff kept records of providers' training participation as measured by percent attendance in training activities. Linear regression models were calculated using R Studio and SPSS to evaluate the extent to which provider characteristics predicted variance in EI providers' reported burnout and self-efficacy delivering Project ImPACT.

Results:

Although provider burnout was related to perceptions of organizational support ($\beta = -0.66$; $p = 0.03$), provider age, sense of cohesion, and years of experience in the EI field were not. The full regression model did not explain a significant amount of the variance in EI provider burnout ($F(4,14) = 1.590$, $R^2 = 0.312$; $p = 0.23$). Similarly, although providers' years of EI experience related to their sense of self-efficacy in delivering Project ImPACT ($\beta = 0.60$; $p = 0.03$), providers' age, sense of cohesion, burnout, and organizational support did not. The full model also did not predict a significant amount of the variance in Project ImPACT self-efficacy ($F(5,13) = 1.285$; $p = 0.33$).

Conclusions:

Preliminary findings revealed that higher levels of perceived organizational support were associated with lower burnout among EI providers. Additionally, years of experience in EI was associated with higher self-efficacy delivering Project ImPACT. Linear regression models evaluating the role of several provider characteristics on provider burnout was not significant, nor was a model evaluating the role of burnout on provider self-efficacy. Further analyses will include a larger sample of providers and the relationship between burnout, training participation, attitudes, and Project ImPACT fidelity. Study limitations and implications will be discussed.

427.077 The Role of Meta-Dehumanization and Autistic Community Connectedness on Autistic People's Mental Health

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Background: Dehumanization is a process by which a person or a group of people are denied human uniqueness or human nature by another person or group of people whereby they are considered as literally sub-human – more as a robot (mechanistic) or animal (animalistic) than person (Haslam, 2006). Previous research has identified that non-autistic adults dehumanize autistic people, including denying them human uniqueness (traits which distinguish human-animals from non-human animals) (Cage et al 2019), but to date, there has little to no research investigating the impact of such dehumanization on autistic people. Meta-dehumanization refers to the concept that a person or group perceives themselves to be dehumanized (Bustillos et al., 2023), and it predicts significantly worse personal and interpersonal outcomes for victims of dehumanization (Bastian & Haslam 2011; Čehajić et al, 2009). For autistic people, it might contribute to the drive they experience to “mask” autistic traits, so as to avoid dehumanization – yet masking is associated with poor mental health and suicidality (Miller et al, 2021) – and so also compound the effect. Lastly, autistic people experience a seemingly unique rapport with other autistic people with autistic community connectedness potentially buffer against some of the effects of discrimination on mental health (Botha 2020).

Objectives: Give this, the aim of this study was to investigate whether 1) autistic people experience higher meta-dehumanization and worse mental health than non-autistic 2) masking mediates the relationship between meta-dehumanization and poor mental health outcomes in the autistic cohort, and 3) whether autistic community connectedness moderates the relationship between meta-dehumanization and masking in the autistic cohort.

Methods: A cross-sectional purposive-sampling study with autistic ($n=149$) and non-autistic people ($n = 99$) was employed. Measures of meta-dehumanization, masking, mental health, and autistic masking were administered.

Results: Autistic people ($M = 32.6$, $SD = 8.74$) experienced significantly meta-dehumanization than non-autistic people ($M = 19.5$, $SD = 8.33$), ($t(246) = 11.75$, $p < 0.001$). Autistic people ($M = 21.7$, $SD = 7.1$) also experienced worse mental health than non-autistic people ($M = 16.7$, $SD = 6.13$); ($t(246) = 5.78$, $p < 0.001$) For the autistic group, the results show that meta-dehumanisation significantly positively predicts worse mental health ($\beta = 0.37$, $t = 4.9$, $p < 0.001$). When including masking behaviour (mediator) into the model, the effect of meta-dehumanisation on mental health did not change ($\beta = 0.31$, $t = 3.96$, $p < 0.001$) Mediation analysis via bootstrapping revealed a significant indirect effect of masking behaviours on the association between meta-dehumanisation and mental health (mean bootstrapped indirect effect = 0.07, with a 95% confidence interval between 0.02 and 0.13, $R = 0.44$, $R^2 = 0.2$). Autistic community connectedness had a significant direct effect on mental health through belongingness with higher belongingness predicting better mental health ($p = .01$), but no moderation effects.

Conclusions: masking and mental health may be in part driven by perceived dehumanization, while belongingness to the autistic community predicts better mental health, it does not buffer against the impact of meta-dehumanization on mental health for autistic people.

427.078 The Roles of Communal Coping and Social Support in Family Functioning According to Primary Caregivers of Autistic Youth

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Background: “Family functioning”, commonly understood as the way in which families interact and operate (Crindland et al., 2014), has generally been found to be poorer among families of autistic individuals compared to families of non-autistic individuals (e.g., Pisula & Porebowicz-Dörsmann, 2017). Factors that have been identified to influence caregivers’ perceptions of family functioning, specifically within families of an autistic individual, include parental gender (e.g., Gau et al., 2012), marital status (e.g., Johnson & Simpson, 2013), socioeconomic status (e.g., Zaidman-Zait et al., 2018), and autistic child’s behaviors (e.g., Brown et al., 2019). Given a greater focus on including family members, especially caregivers, in autism-focused interventions (e.g., Crindland et al., 2013), understanding factors that may influence family functioning and how they interrelate is becoming increasingly important.

Objectives: The present study aimed to explore how primary caregiver distress, communal coping during family challenges (i.e., communal coping), and social support relate to overall family functioning within families of autistic youth.

Methods: 106 primary caregivers ($M_{age} = 41.4$; 87% biological mothers; 88% female, 85% White, 77% married) of autistic youth ($M_{age} = 11.47$; 87% male; 82% White) completed an online or paper survey. Primary caregivers reported demographic information related to themselves, their autistic child, and their family in addition to completing measures assessing their overall distress (i.e., DASS-21; Lovibond & Lovibond, 1995), communal coping (i.e., The “communal coping during family challenges” scale; adapted from Afifi et al., 2015), social support (i.e., Multidimensional Scale of Perceived Social Support; Zimet et al., 1988), and family functioning (i.e., McMaster Family Assessment Device; Epstein et al., 1983). Primary caregivers also completed measures assessing their autistic child’s overall severity of symptoms and broadband adjustment.

Results: Linear regression analyses using The PROCESS tool (Hayes, 2018) for SPSS revealed significant direct and total effects of overall primary caregiver distress on family functioning (i.e., higher scores indicated poorer family functioning) across both models. When examining communal coping as a mediator, analyses also revealed a significant indirect effect of primary caregiver distress on family functioning through communal coping (see Figure 1). Similarly, when examining social support as a mediator, analyses revealed a significant indirect effect of primary caregiver distress on family functioning through social support (see Figure 2). However, significant direct effects of primary caregiver distress on family functioning remained when probing for each mediator, indicating that communal coping and social support may partially explain the relationship between primary caregiver distress and family functioning. All results were controlling for autism symptom severity and broadband adjustment of the autistic child.

Conclusions: Results reiterate that primary caregiver distress relates to poorer family functioning. Additionally, results indicate that both communal coping and social support may mediate this relation between primary caregiver distress and family functioning, providing additional points of intervention to improve family functioning among families of autistic youth. More specifically, family-based interventions should focus on increasing effective communication and coping efficacy among families and bolstering social support for caregivers in hopes of improving overall family functioning and autistic child outcomes.



427.079 The Social Impact of Experiences with Strength-Based Inclusive Employment: Autistar's Influence on Public Attitudes Toward Autistic People

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Background: Social inclusion and connectedness are critical determinants of the quality of life for all individuals, including those with disabilities. However, people with disabilities often face exclusion and marginalization due to persistent prejudice and negative societal attitudes. Autistic people, who frequently experience challenges in social communication, are particularly vulnerable to such exclusion. Exploring public experiences with autistic individuals can help identify strategies to reduce social distance and improve community acceptance. Recently, AUTISTAR, a South Korean design company that employs autistic designers and provides strength-based, individualized support, has gained recognition as a successful employment model that may positively influence public perceptions of autism.

Objectives: This study aimed to assess how experiences with AUTISTAR influence social distance and public attitudes toward autistic people.

Methods: We used a mixed-methods design comprising an online survey and focus group interviews (FGIs). The online survey assessed social distance toward autistic people and familiarity with AUTISTAR among three subgroups (no exposure, some familiarity, and high familiarity), with a total of 138 participants (46 per group). For quantitative data, t-tests were used to examine associations with gender and having a family member with a disability, correlational analysis for age, and ANOVA for familiarity with AUTISTAR to explore how these factors were associated with social distance toward autistic people. Additionally, FGIs were conducted with 11 participants purposefully recruited for their extensive contact with and familiarity with AUTISTAR. These interviews included open-ended questions on their experiences with AUTISTAR and its autistic employees. Content analysis was used to examine participants' interview responses.

Results: The quantitative analysis revealed no significant differences in social distance based on age, gender, or having a family member with a disability (all p s > 0.05). However, prior familiarity with AUTISTAR was significantly associated with social distance ($p < 0.0001$), with post-hoc tests indicating that participants familiar with AUTISTAR reported lower levels of social distance compared to those with no or limited familiarity. Furthermore, 96% of respondents viewed AUTISTAR positively, suggesting a favorable perception of its employment model and its potential role in promoting positive attitudes toward autistic individuals. Qualitative findings showed that participants with experience in AUTISTAR recognized its positive impact on autistic people, their families, and the broader community through strength-based employment support. They reported a decrease in social distance, attributing this to positive interactions and an increased understanding of autistic individuals' abilities. Before their experiences with AUTISTAR, participants often held negative or indifferent views about autistic people. However, after interacting with AUTISTAR, they observed that autistic people could contribute meaningfully to the community when provided with appropriate support. Participants expressed confidence in working alongside autistic individuals and supporting their community participation.

Conclusions: The findings suggest that AUTISTAR may reduce social distance toward autistic people by providing opportunities for the public to engage with autistic individuals in meaningful ways, challenging misconceptions about their abilities, and highlighting their strengths. Reducing social distance and stigma requires both frequent and high-quality interactions, which can be promoted through inclusive employment and community activities to foster a more accepting society.



427.080 The State of Affairs of Existing Service Outcome Measure According to Autistic Adults, Service Providers and Academic Researchers: What to Improve and How to Do It

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Background:

Although autism research for autistic adults has proliferated over recent years there remains a critical void in outcome measurement tools that are accessible, understandable, and usable by the autism community. The majority of instruments used in services and research programs were not developed for nor with autistic adults. This contributes to a higher likelihood that instruments do not function as intended, and this may also introduce measurement bias leading to inaccurate ratings.

Objectives:

The current study aimed to address the following research questions:

- (1) What are the common problems of existing measurement tools according to stakeholders?
- (2) What types of measurement adaptations address these issues?

Methods:

Researchers from the longstanding AASPIRE team used a community-based participatory research (CBPR) approach throughout the project. We collected and combined data from three related sources: 1) surveys from a CBPR-nested Delphi process with 52 participants, including autistic adults, leaders from community organizations, healthcare systems, disability service systems, and academic researchers (categories not mutually exclusive), who reviewed a set of existing measures that assess high priority outcomes for the autism community 2) an institutional ethnography of workgroup meeting notes and artifacts from the AASPIRE 22-member team process adapting or creating a set of 22 instruments; and 3) Cognitive Interviews with 37 autistic adults. Delphi survey responses were calculated per endorsed problem type: 1) autism-related issue, 2) problematic language, 3) accessibility, 4) understanding construct difficulties and 5) usability issues. Participants were given the option to say no issues were present, select types of issues, or state an issue using an open-ended response. Transcripts and field notes from meetings were coded to identify recommended adaptations. After adapting or creating a set of 22 instruments, we conducted cognitive interviews to assess the instruments' content validity and determine what additional changes might be needed. This iterative process continued until all measures were considered accessible, understandable, and usable.

Results:

52 Delphi panelists reviewed 51 potential measures for 26 outcomes, and identified challenges across the measurement tools, indicating a variety of concerns (see Table 1 for full list of response options). The most frequently endorsed concerns were adaptability (n=324 reported issues; e.g. clarify instructions), accessibility issues (n=317 reported issues; e.g., confusing terms or imprecise response options) and autism-specific issues (n=197 reported issues; e.g., failing to capture autism-related aspects of constructs). No measure was exempt from issues; the majority of participants indicated that every measure would need at least minor adaptations to be usable in one or more identified challenge area. Based on this feedback, we adapted or created twenty-two measures. Workgroup meetings and cognitive interviews identified 15 specific recommendations for adaptations, such as visual aids response options, hotlinks with definitions and examples, and simplified language (see Table 2 for full list of adaptations).

Conclusions:

Results from this study indicate the pervasive issues in accessibility and functionality when using measures that are not designed with a CBPR approach. These conclusions have wide-ranging implications across research and services, emphasizing the importance of meaningful inclusion of target populations when creating outcomes measures.

**427.081 The Struggle for Meaningful Employment Among Autistic Adults in Canada**

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Background: The employment rate for autistic individuals in Canada is estimated to be below 15%, leaving many either unemployed or underemployed. With most services and supports for autistic individuals ending at age 18, the difficulty in securing stable employment significantly jeopardizes the quality of life for both autistic adults and their caregivers, further marginalizing an already vulnerable population.

Objectives: This study aims to understand the experiences of autistic adults in employment settings in Canada, while exploring factors that might relate to the staggering low employment rate for autistic people.

Methods: Twenty participants between the ages of 19 and 53 years (Age M(SD) = 35.12 (11.73) years; 9 males, 11 females) from Ontario, Canada took part in semi-structured interviews that explored their employment related experiences. Autistic traits were assessed with the Autism-Spectrum Quotient with scores ranging from 23-41 (AQ M(SD) = 30.56 (4.51)). Report of participant's highest level of education indicated that 10 participants had post-secondary degrees, 3 were currently pursuing post-secondary degrees, 6 completed high school, and 1 had some high school. During the interview participants provided information regarding their job history; their experiences in the workplace; their thoughts on their future employment; and accommodations received at the workplace.

Results: Across the participants interviewed, 6 were currently employed full-time, 5 were employed part-time, 3 were seeking opportunities, 3 were students, 1 was a stay-at-home parent, and 1 was on long-term disability. In terms of the employment positions reported, the majority of the jobs described were in retail (e.g., clothing or grocery stores), food service (e.g., barista, fry-cook, etc.), or entry-level administrative positions (e.g., receptionist, file clerk, etc.), with only 3 participants reporting employment related to their education or specialized skills (e.g., IT consultant, marketing manager, learning consultant). The average duration of employment ranged from one day to 20+ years, with only 4 participants reporting steady employment for more than 5 years. When participants were asked to rate their confidence in their ability to keep a job, the average rating was 55.7% (SD = 30.8%) confident. When asked about accommodations received in the workplace, 10 reported receiving no accommodations. For those who did report accommodations, they included flexible hours, noise cancelling headphones, breaks, patience from employers, remote work, and personalized support.

Conclusions: This study highlights the grim reality of employment for autistic adults in Canada. Despite many participants being well-educated, with half holding post-secondary degrees, meaningful employment remained elusive for most. The majority of jobs held were low-wage, entry-level positions in retail, food service, or administration, with only three individuals employed in roles related to their education. Confidence in job retention was also low, with an average self-rated confidence of just over 55%. Additionally, half of the participants reported not receiving any workplace accommodations, further illustrating the systemic barriers that prevent autistic individuals from securing and maintaining meaningful employment. This bleak landscape underscores the need for more inclusive and supportive workplace environments for autistic people, particularly those with higher education.

427.082 The Views and Experiences of Autistic Adults Regarding Early Autism Interventions: A Systematic Review, Thematic and Descriptive Narrative Syntheses

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Background: In the last two decades, autistic adults have become more and more involved in different areas that affect autistic people's lives. The idea that autistic voices should be heard when discussing autism research is consistent with overall values in healthcare, research and education (e.g. Patient and Public involvement in healthcare). However, the research on early autism interventions typically focuses on parental views and priorities, and the perspective of autistic people has not been asked until very recently. Autistic people expressed concerns regarding the potential of specific types of interventions to cause harm and voiced their priorities on intervention goals. New studies are constantly emerging, and this systematic literature review aims to synthesise the latest evidence. To our knowledge, this is the first systematic literature review on the topic.

Objectives: To identify and synthesise the evidence regarding views and experiences of autistic adults regarding psychosocial early interventions for autistic children, including specific intervention goals, practices and contexts.

Methods: Four electronic bibliographic databases (Web of Science Core Collection, Education Resource Information Centre, Education Database and PsycInfo) were searched together with additional search strategies: reference searching and cross-checking via Google Scholar. Quality appraisal was performed using the Quality Assessment with Diverse Studies (QuADS) appraisal tool. 13 studies were identified, 5 quantitative or mixed-methods (all surveys) and 8 purely qualitative. A results-based convergent synthesis design was used: the qualitative and quantitative data were originally treated separately and then cross-checked. Qualitative data was originally analysed using thematic synthesis. Quantitative data was analysed using descriptive narrative synthesis. Goals, practices and context were summarised using textual description and tabulation, and goals were additionally synthesised using data transformation and a visual representation.

Results: Among qualitative studies, three main themes were developed – A child's voice, which explores how the interventions can take into account the child's perspective, Accept our disability, which combines autism acceptance with acknowledgement of autistic difficulties and Damage done, which talks about negative experiences of autistic people who underwent early autism interventions. In quantitative studies, autistic people consistently rated quality of life and reducing harmful behaviours as the top priorities for the interventions and goals involving reducing autism symptoms as the lowest priorities. Overall, the findings between quantitative and qualitative studies were consistent. More studies are needed about intervention practices and contexts, as well as studies that ask autistic adults with higher support needs.

Conclusions: Across the studies, autistic adults consistently emphasised the need to consider the child's inner perspective, as well as making the early interventions autism-affirming. Autistic adults also consistently disagreed with goals that target autism symptoms and discussed their previous negative experiences with early interventions and the impact of those experiences on their lives.

427.083 The Voice of the Autism and Related Rare Genetic Condition Community: Treatment Preferences within the European Autism Genomics Registry (EAGER) Study

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Background: Autism is a prevalent neurodevelopmental condition with a complex genetic basis. Many autistic individuals face unaddressed healthcare challenges that could be informed through genomics research and clinical trials. This includes support for co-occurring conditions, along with autism features. A focus on personalised, multidisciplinary approaches to clinical care in autism and associated rare genetic conditions (RGCs) is necessary to address specific individual needs. Precision medicine approaches informed by specific biological mechanisms may benefit individuals with a known genetic etiology.

Objectives: To understand the key health and developmental concerns among autistic individuals and individuals with related RGCs, and identify participant reported priorities for target interventions, which will help to inform future research and clinical trials.

Methods: The European Autism GENomics Registry (EAGER) aims to create a registry of up to 1,500 autistic individuals and individuals with RGCs associated with autism across 13 sites, who will all have undergone whole-genome sequencing. Medical history and development were assessed using a set of questionnaires, completed either by participants themselves or by their parents, depending on age and ability. The Voice of the Community questionnaire was used to examine current health and developmental concerns, their impact on participants, and participant preferences for target interventions.

Results: Preliminary results were based on a UK sub-sample from two EAGER sites (King's College London, KCL, and Guy's and St Thomas', GSTT) included in the current descriptive analysis. To date, 31 autistic (mean age = 28.9 ± 21.0 SD; gender = 20 male: 11 female) and 28 RGC (mean age = 12.3 ± 7.3 SD; gender = 11 male: 17 female) have taken part in the study (Table 1). Greater than half of the autistic group reported developmental and health concerns related to difficulty with social interaction (77.4%), anxiety (77.4%), sensory issues (71.0%), attention issues (64.5%) and sleep problems (61.3%), while the RGC respondents, 65.5% of whom had Tuberous Sclerosis Complex (TSC), reported highest concerns related to intellectual disability or learning delays (67.9%), attention issues (53.6%) and epilepsy/ seizures (57.1%). The top three target interventions reported as important to the autistic group were to improve mood irritability or anxiety (41.9%), sleep (32.3%), and social interaction abilities (29.0%), while learning and cognitive ability (46.4%), seizures (35.7%) and speech and language (28.6%) were the highest priority for target interventions for the RGC group (Table 2).

Conclusions: We report preliminary data on a sub-sample of the EAGER cohort, which suggest that there are differences in reported concerns and intervention preferences between the autistic and RGC cohorts. It is critical to note that the majority of the RGC cohort to date is comprised of a single condition, TSC, warranting caution in generalising treatment target priorities to other RGC communities. The full cohort from 13 sites will be added for further analysis to understand health and developmental concerns and establish priorities for target therapeutics for a European autism and RGC cohort. The EAGER registry will support recruitment for future clinical trials and studies, leveraging genetic, clinical, and phenotypic data, alongside participant priorities.



427.084 Toward Overcoming the Double Empathy Problem: Bridging Autistic and Neurotypical Minds through Science and Art
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Background:

The *Double Empathy Theory* proposes that empathy gaps between autistic and neurotypical (NT) people arise from breakdowns in *mutual* consensus, rather than failures by autistic people. Unfortunately, empathy gaps are linked to myriad personal and societal challenges. Thus, improving cross-neurotype connection could result in greater compassion and inclusion, impacting autistics and NTs alike.

All people experience challenges with various types of stress and reactivity when faced with social and environmental demands. The degree of such reactivity varies by context. Common high-demand scenarios might include public speaking and high-stakes conversations, among others. However, some, including many autistic people, experience elevated reactivity to situations typically considered less demanding (i.e., classroom, grocery store, library, etc.). By drawing on their own patterns of reactivity during demanding situations, NT individuals might more readily empathize with autistic persons' reactions to seemingly less extreme scenarios.

Objectives:

Thus, we scientifically examined overlaps in reactivity to common scenarios between autistic and NT individuals, hypothesizing that commonalities would occur across different, not within the same, scenarios. Then, we worked with artists to translate scientific findings into artistic representations of the thoughts, feelings, and experiences (i.e., "minds") of autistic and NT people. We propose that allowing autistic and NT people to "see" each other's minds side-by-side, via artistic depictions, could facilitate greater autistic-neurotypical empathy.

Methods:

Phase 1 (Quantitative): Participants were 35 autistic individuals (17 female) and 300 NT people (150 female), ages 18-26. Each subject completed a survey, which included an original questionnaire consisting of questions about their reactivity to eight scenarios, each differing in its level of social/environmental demand. The survey also included standardized questionnaires, measuring sensory processing, mental health, and autistic traits. Statistical analysis included: i) Between-group comparisons of reactivity scores within- and between-scenarios; ii) correlational analysis between standardized and scenario questionnaire scores.

Phase 2 (Qualitative): We conducted semi-structured interviews with six autistic and six NT young adults (3 male/3 female, respectively). Interviews explored participants' experiences with comfortable and uncomfortable social interactions and environments. We then performed thematic analysis.

Finally, we collaborated with four illustrators to convert our findings into artistic representations of the "minds" of autistic and NT participants.

Results:

Phase 1 results showed significant between-group differences in most comparisons of reactivity scores within the same scenario (autistic > NT). In contrast, many similarities were found between scores associated with less intense scenarios in autistic participants vs. those for more demanding scenarios in NT subjects. Phase 2 analyses revealed themes consistent with, yet providing deeper insights into, quantitative findings. Artistic representations of the combined results will be presented and discussed.

Conclusions:

Diagnoses aside, there appear to be common, yet context-dependent patterns of human reactivity. While cross-neurotype empathizing can be difficult, building mutual understanding on inter-group similarities may facilitate this process. Using artistic means, based on scientific findings, to elucidate similarities in reactivity across scenarios simultaneously provides rigorous technical understanding and could encourage viewers to do the hard work of empathy, which, has the potential to improve quality of life, clinical/educational practice, family relationships, and society at large.

**427.085 Train: Trauma Recovery for Autistic, Intellectually Disabled, and Neurodivergent Adults**

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Background: The impact of Adverse Childhood Experiences (ACEs) is well documented in the research, showing far reaching impacts on physical and mental health throughout the lifespan. However, the impact of ACEs on individuals with autism has not been as thoroughly studied. This lack of research stands in stark contrast to the data that suggests individuals with developmental disabilities may have up to three times the risk of trauma exposure compared to neurotypical peers. As a result of the lack of research on impacts of trauma in autistic individuals, there is a subsequent gap in effective trauma therapies for this population. To address this gap, a training program for licensed therapists was developed to adapt known Trauma-Focused Cognitive Behavioral Therapy (TF-CBT) techniques to use with autistic adults.

Objectives: To develop a training program for licensed therapists who already treat autistic individuals to support the unique needs of this population who have experienced trauma using assessments, measures, and techniques adapted from current evidence-based TF-CBT.

Methods: A 12-week didactic training program was developed combining self-paced learning and instructor-led discussions. At the end of the program, participants complete surveys on their experience with the materials. 6 month follow up surveys are being completed with all therapists who complete the program in order to gather information on their knowledge, attitudes, and potential behavior change.

Results: To date, 73 licensed therapists have completed the 12-week program with 52 of those completing the initial post-training survey. 77% of respondents indicated the program exceeded or greatly exceeded their expectations. 94% of respondents rated the quality of content as above average or exceptional. 96% of respondents rated the quality of the presentation as above average or exceptional. 85% of respondents indicated the program helped them professionally and 100% of respondents would recommend the program to a fellow therapist.

Conclusions: The overwhelming majority of respondents indicated the program materials and content were of high quality and were already of benefit to them in their professional practice. It is important to note that while some respondents did not rate some aspects of the course favorably, they all did indicate they would recommend the program to fellow therapists, highlighting the importance and usefulness they ascribe to the program.

427.086 "It's Part of Me": Exploring Autistic Adolescents' Thoughts & Feelings Towards Their Autistic Identities/ Autism**Diagnoses**

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Background: Adolescence is characterized by active and ongoing identity development as individuals make meaning of their lived experiences in the context of their social environment (Jones et al., 2015). Extant studies of autistic identity development highlight that more positive feelings about autistic identity lead to better mental health outcomes for adolescents (Davies et al., 2024; Cooper et al., 2023). Increasingly more studies acknowledge autism as an aspect of identity (Botha & Gillespie-Lynch, 2022), yet relatively few have examined how autistic adolescents feel about their autism diagnoses, and whether they consider autism to be a facet of who they are.

Objectives: The aim of this study was to explore autistic adolescents' thoughts, feelings, and attitudes about their autism diagnosis.

Methods: Sixty autistic teens (Mage = 16.65, SD = 1.18, range = 14.77-18.57; IQ range: 83-141) living in the Washington, D.C metropolitan area participated in semi-structured interviews prior to their participation in an executive functioning intervention. Participants were primarily White (76.7%) and male (70%) and had an average full-scale IQ of 109.78 (SD = 13.58, range = 83-141). All participants were diagnosed with autism according to parent-report, the Social Communication Questionnaire (Rutter, Bailey, & Lord, 2003), and/or met criteria for autism per an expert clinician using DSM-5 criteria (American Psychological Association, 2013) or an ADOS-2 (Lord et al., 2012). Interviews asked the teens to describe their current diagnoses, feelings towards those diagnoses, and whether they disclose their diagnoses to friends or feel comfortable talking about them in social settings. Reflexive thematic analysis (Braun and Clarke, 2006) was used to code the interview responses and generate preliminary themes.

Results: Many teens self-reported having at least one co-occurring diagnosis in addition to autism. ADHD (65%) and anxiety (27%) were the most commonly reported additional diagnoses. Preliminary thematic analysis revealed six emergent themes: 1) The label of 'autism' doesn't feel like me, 2) My diagnosis helps with self-understanding, 3) Connection to neurodivergent community/friends, 4) Weighing and wrestling with how I feel about aspects of my diagnoses, 5) Doubt and/or denial of my autism diagnosis, and 6) Autism is just a part of who I am.

Conclusions: Our findings highlight the heterogeneity among autistic adolescents' thoughts and attitudes about their autistic identities. Some teens describe struggling with the label of autism (many preferring to rely on alternative terms such as Asperger's) and several participants doubted or denied their diagnoses altogether. Others found that their diagnoses helped them understand themselves better or were part of their emerging self-concept. Most teens were engaged in a continual, iterative process of weighing and wrestling with their feelings to make meaning of their autism diagnoses, often comparing the impact of their autism to other co-occurring diagnoses in their day-to-day experiences. Importantly, this study includes autistic adolescents without intellectual disability. Future studies should explore attitudes towards autism diagnosis and identity within an autistic sample with greater diversity in race/ethnicity and IQ.

427.087 Trajectories of Psychological Distress and Life Satisfaction in Parents of Children with Autism from Early Childhood to Late Adolescence

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Background: The existing evidence on trajectories of wellbeing in parents of children with autism (Barker et al., 2011; Benson, 2016; May & Williams, 2022) is scarce and mixed. Additionally, there are very few studies focusing on both mental health difficulties and mental wellbeing when examining trajectories of wellbeing in parents of children with autism. Moreover, although child behaviors have been demonstrated as important predictors of parental wellbeing, very few studies have considered both between- and within-person effects (Barker et al., 2011).

Objectives: We aimed to examine trajectories of psychological distress and life satisfaction in parents of children with autism between early childhood and late adolescence. Additionally, both between- and within-person effects of child externalizing and internalizing problems, and child prosocial behavior on the trajectories of parental psychological distress and life satisfaction were examined.

Methods: Participants were parents of 636 children with autism (77% male; 89% white; 51% families living in deprived circumstances) drawn from the UK Millennium Cohort Study. Seven waves of data, collected when cohort children aged approximately 9 months, 3, 5, 7, 11, 14, and 17 years, were analyzed. The Kessler 6 (Kessler et al., 2002) was used to measure parental psychological distress. Participants were asked to rate their life satisfaction on a scale of 1 to 10. The Strengths and Difficulties Questionnaire (Goodman, 1997) was used to measure child externalizing and internalizing problems, and prosocial behavior. Data were analyzed using multilevel growth modeling.

Results: Parental psychological distress increased linearly from child ages 3-17 years ($B = .16, SE = .02, p < .001$), whereas parental life satisfaction showed a cubic rate of change, initially decreasing from 3-5 years ($B = -.36, SE = .06, p < .001$), then improving between 5-11 ($B = .11, SE = .01, p < .001$), and returning to decline from 11-14 years ($B = -.01, SE = .00, p < .001$). Regarding the between-person effect of child behaviors, higher average child externalizing and internalizing problems over time were associated with higher initial parental psychological distress at child age 3 years ($B = .25, SE = .05, p < .001$; $B = .32, SE = .05, p < .001$). Higher average child internalizing problems over time were associated with lower initial parental life satisfaction ($B = -.07, SE = .03, p = .044$). At the within-person level, within-child changes in externalizing and internalizing problems were positively associated with within-parent changes in psychological distress ($B = .09, SE = .03, p = .001$; $B = .10, SE = .02, p < .001$); within-child changes in prosocial behavior were positively associated with within-parent changes in life satisfaction ($B = .05, SE = .03, p = .039$).

Conclusions: Across early childhood to late adolescence, psychological distress and life satisfaction in parents of children with autism show differing shapes of change, despite sharing an overall reduced trajectory. Trajectories of psychological distress and life satisfaction in parents of children with autism have distinct sets of child behavior predictors, specifically differing in within- and between-person effects.



427.088 Autism Services for Latinx Children and Their Families: Professionals' Perspectives

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Background: Latinx children with autism and their families face significant disparities in accessing autism services, received fewer intervention services compared to non-Latinx White children, and are less satisfied with the services they receive. There are cultural differences, language barriers, and systemic inequities that contribute to these disparities, creating challenges for both families and professionals. There is limited research focusing on professionals' experiences working with culturally and linguistically diverse families, particularly Latinx families receiving autism services. This study aims to explore professionals' perspectives, challenges and needs when working with Latinx children with autism and their families, as well as to review their practices using the Cultural Competence Framework (Cross et al., 1989).

Objectives: The objectives of this study are to (1) examine professionals' experiences working with Latinx children with autism and their families, (2) identify professionals' challenges and needs in delivering culturally responsive services, and (3) explore the process of developing cultural competence among professionals using the Cultural Competence Framework.

Methods: This qualitative study involved interviews with 13 professionals, including speech-language pathologists, early intervention specialists, Board-Certified Behavior Analysts, etc., across two U.S. states. Participants were recruited through early intervention agencies that serve Latinx populations. Interviews were conducted via Zoom, focusing on professionals' practices, challenges, and perceived needs to provide successful services to Latinx families. Data were analyzed using thematic analysis to identify common themes, guided by inductive coding methods and triangulation to ensure reliability and validity. Two coders coded all interviews individually and met frequently to discuss discrepancies and reach consensus.

Results: Four key themes emerged from the data: (1) Navigating Latinx Families' Cultural Beliefs and Values, where professionals reported awareness (or lack of thereof) of cultural differences, and challenges related to these cultural differences such as familismo and mistrust in autism diagnoses and services; (2) Addressing Cultural Mismatches, highlighted the difficulties of providing culturally congruent services, especially due to language barriers and mismatched cultural expectations; (3) Addressing Professional Development and Resource Shortages, revealed a need for more robust training and culturally tailored resources for professionals; and (4) Fluctuations in Cultural Competence, illustrating the continuous developmental process professionals undergo in moving from cultural incapacity to proficiency, with a focus on self-awareness and ongoing professional development.

Conclusions: These findings highlight the importance of culturally responsive training and resources for professionals working with Latinx children with autism. Professionals face several challenges in aligning services with Latinx families' cultural expectations and addressing systemic barriers. The Cultural Competence Framework provides a valuable lens for understanding, analyzing and improving services delivery for Latinx populations, offering pathways for enhancing professional development and bridging cultural gaps in autism care.

427.089 Navigating Work Environments, Education Systems, and Discourses of Disability in Schools: A Reflexive Thematic Analysis of Autistic Educators' Lived Experiences and Perspectives

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Background:

Prior research on autistic people's experiences in schools has primarily focused on autistic students' perspectives (Danker et al., 2016; Humphrey & Lewis, 2008). However, researchers have recently begun examining autistic educators' work experiences (StEvans, 2024; Wood & Happé, 2023). Including the perspectives of autistic teachers can bring valuable insights into supporting their well-being and quality of life, which is aligned with the goals of neurodiversity movements (Pellicano & den Houting, 2022).

Objectives:

This reflexive thematic analysis (RTA; Braun & Clarke, 2022) explores autistic educators' lived experiences in their workplaces. Throughout an interactive and recursive process, we (re)construct (Agar, 2021) participants' shared stories of navigating the assumptions and expectations of co-workers and leaders, their contributions to and struggles within inclusive education, perceptions of disability discourses, and positive experiences in their workplace.

Methods:

We conducted semi-structured interviews with eight autistic educators currently working in U.S. schools. We analyzed transcripts as a team of researchers with various experiences working in schools. We systematically engaged with our data, kept a clear memoing record, and met frequently to construct our themes and collectively present a coherent and multilayered narrative. We generated themes through six rounds of data analysis by adapting Braun and Clarke's (2022) RTA approach: initial data familiarization and sense-making; open individual coding; team thematic mapping with flexibly defined codes and initial themes; coding and sorting in pairs of researchers to capture candidate themes with clear central ideas; theme revision and refinement; and theme defining and naming.

Results:

We generated four themes that cut across our participants' work experiences (see Table 1 for example quotes and codes exemplifying each theme). First, their stories illustrated declining respect towards the teaching profession, revealing a systemic-level crisis of teacher agency that likely impacts all teachers, but may more significantly impact autistic teachers. Second, autistic educators' unique contributions to inclusive education were often barricaded by manifestations of neuronormative power relations, such as neurotypical practitioners' dismissal of autistic teachers' neurodiversity-informed support for disabled students. Third, there were pervasive consequences of disability discourses that were detrimental to autistic teachers as well as to students. For example, ableist discussions of students' disabilities discouraged autistic teachers from disclosing their own disability. Fourth, their descriptions of positive work experiences revealed traces of hope, but participants also suggested that higher-level changes occurred due to interest convergence with non-autistic teachers, not necessarily as efforts to improve autistic teachers' work conditions.

Conclusions:

Our participants are passionate educators who made valuable contributions to their schools. The four intertwined themes indicate the complexity of their experiences. Rooted in systems, power relations, and discourses of disability, problems underlying participants' challenges amplified each other. However, participants' positive experiences demonstrated that solutions to those problems exist and that changes can potentially happen. Future researchers, school practitioners, and policymakers should listen to autistic educators to empathize with their experiences and perspectives. All school professionals should reflect on practices and policies to synergically resist ableism and promote positive institutional and systemic changes for a more just work and learning environment.



427.090 Understanding Latinx Autism Community Perspectives on the Puzzle Piece and Infinity Symbol

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Background: Puzzle pieces have symbolized the Autism community for decades . Recently, however, there has been a growing debate against its use. Autistic self-advocates suggest that a puzzle piece represents an incomplete self (Gernsbacher et al., 2018), heightening stigma against the community. Despite the puzzle piece's global recognition, self-advocates suggest the use of a golden infinity symbol instead. According to self-advocates, the golden infinity symbol represents acceptance and inclusivity, aligning with the neurodiversity movement's values. The rainbow infinity symbol represents neurodiversity as a whole, marking the importance of all neurological conditions. In the context of autism, community-based participatory research is crucial as it fosters collaboration between researchers and communities, ensuring that studies are culturally relevant, address the specific needs of underrepresented groups, and lead to more accessible and impactful interventions for autistic individuals and their families.

Objectives: To examine the Latino Autism community interpretation of the puzzle and infinity symbol as representation of the autism community in a Mexican-US border town.

Methods: Four focus groups (3 with parents of autistic children and 1 with autistic self-advocates) were conducted by two bilingual trained facilitators following a script informed on previous literature. These comprised 25 parents of children on the spectrum and 8 autistic adults, and happened between March and May 2023. Audio recordings were transcribed for later analysis using thematic analysis. Three independent coders reviewed the transcripts, identifying different themes and subthemes. After comparing findings, they reached a consensus on the common subjects. Data was abstracted from a larger project focusing on predictors of language development in autistic children.

Results: The qualitative analyses of the self-advocates' responses noted that the puzzle piece, although not joint to anything else, still represents a functional person. Whereas the use of the infinity symbol acknowledges the neurodiversity community as a whole, and it shows awareness on the researchers behalf. Parents had no negative connotation of the puzzle symbol, and regarded that seeing it heightened their sense of belonging.

Additionally, they noted that it represents a community.

Conclusions:

Overall, the community's interpretation of both symbols is positive, and they encourage the use of both to foster a sense of belonging and inclusivity. This study highlights that the notoriety of the puzzle piece is acknowledged and should not be entirely discarded from outreach efforts, particularly when engaging with Latinx communities. In the Rio Grande Valley, a region located in the U.S.- Mexico border which has been historically underserved with limited access to services and education, outreach efforts rely heavily on the implication of belonging and trust. Given that about 42% of people in the RGV are considered illiterate, symbols can transcend language barriers. Additionally, visual communication accounts for 80% of the information processed by the brain (Thomasino, 2019). Therefore, it is imperative to understand the community's interpretation of symbols, given their cultural characteristics (Domiszewska, 2023), to foster a sense of trust. As the golden infinity symbol gains more traction, it may be important to revisit the community's interpretation of both symbols.

427.091 Understanding the Neurodivergent Superordinate Identity: Identity Endorsement and Language Preference

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Background:

With the rise of the neurodiversity movement, "neurodivergent" or "neurodiverse" has emerged as a broad, superordinate identity that potentially includes various minority groups. While social identity theory suggests that superordinate identities can unite individuals under a shared banner, the neurodivergent identity presents some unique challenges. First, the neurodiversity movement originated from autism advocacy—a political movement led by a single minority group. Second, there remains no accepted, clear definition of which minority groups or characteristics "neurodivergent" encompasses. Current literature lacks clarity on how individuals identify with this identity and what terminology they prefer to describe it.

Objectives:

To explore how four commonly included neurodivergent minority groups identify with the neurodivergent superordinate identity, and the terminology they prefer and find offensive.

Methods:

Participants were 772 Neurodivergent adults ($M_{age} = 34.88$, $SD = 10.51$; Woman = 370, Man = 354, Non-binary/genderfluid = 39) from the United Kingdom ($n = 398$) and United States ($n = 367$) recruited from Prolific. Participants reported a sole formal diagnosis of Autism ($n = 193$), ADHD ($n = 206$) and Dyslexia ($n = 180$), or formal diagnoses of both Autism + ADHD ($n = 193$). Participants responded to demographic questions and trait measures of Autism (English et al., 2021), ADHD (Kessler et al., 2005), and Dyslexia (Snowling et al., 2012). A social identity measure (Leach et al., 2007) was first worded to assess endorsement of a diagnostic identity, and then neurodivergent identity. Participants then responded on a 7-point Likert scale assessing preferences for (1=Strongly dislike; 7=Strongly like) or offensiveness of (1=Least offensive; 7=Most offensive) six terms identified in a pilot study of neurodivergent individuals as key terms used in the community. Participants also rated how frequently they use any of the neurodiversity terms (1=Never; 5=Always).

Results:

Overall one-way ANOVA showed that groups differed on individual diagnostic traits as would be expected (see Table 1). Dyslexic participants were less likely to endorse a diagnostic identity. Dyslexic participants were significantly less likely to endorse a neurodivergent identity than all other groups, and the Autism + ADHD group were significantly more likely to endorse a neurodivergent identity. 'Neurodivergent' had the highest rated mean preference score, significantly higher than all other labels. 'Neurodiverse' was rated second and significantly different to all other labels, and 'neurominority' was statistically the least preferred label. Offensiveness scores reflect the preference findings (i.e., neurodivergent = least offensive). The Autism + ADHD group reported using the neurodiversity terms the most frequently, and the dyslexia group the least, with no significant differences between the Autism and the ADHD groups.

Conclusions:

Together these findings suggest that not all who fall under the 'neurodivergent' superordinate identity endorse that identity to the same degree. This is especially true for dyslexic participants who endorsed the neurodivergent identity below the midpoint of the measure. Neurodivergent was the most popular and least offensive label, with neurominority the least popular and most offensive. Groups tended to have a similar pattern of preference for labels, but dyslexic people were least likely to use them.



427.092 Unheard Voices: A Systematic Review of Studies Using Self-Report to Gather the Perspectives of Autistic Adults with Intellectual Disability

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Background: Autistic individuals, particularly those with intellectual disability, have been historically underrepresented in autism research. Traditional studies have often relied on informant reports from parents, teachers, or clinicians, which may not fully capture autistic people's lived experiences. Autistic individuals with intellectual disability remain underrepresented in research due to inaccessible methods and recruitment challenges, limiting the understanding of their lived experiences. Innovative approaches, such as photovoice and Talking Mats®, have been used in intellectual disability research to adapt to participants' communication strengths. Autism researchers are now beginning to explore similar inclusive methods, however, a comprehensive review analysis of this body of research remains absent. Understanding the scope of existing research and the methodologies employed is crucial for informing and directing future studies that aim to address the significant gaps in the inclusion of autistic adults with co-occurring intellectual disability. A systematic review can also provide researchers with a repository of various methods, enabling them to select and apply appropriate techniques, thereby increasing the usage and recognition of these methods as rigorous and valid approaches. **Objectives:** This systematic review aims to critically examine existing research that employs self-report methods in studies focused on Autistic adults with intellectual disability. It will evaluate the scope of this research, the self-report measures used, and the extent of community involvement.

Methods: A systematic literature review was conducted in accordance with PRISMA guidelines. We searched PsycINFO, Scopus, MEDLINE, ERIC, CINAHL, and Web of Science for studies published between January 2013 and July 2023. A narrative synthesis was undertaken to evaluate study characteristics, the use of self-report measures, and the involvement of autistic individuals and their communities in the research process.

Results: We screened 4,451 abstracts and 277 full-text articles. Fourteen studies met the inclusion criteria. The majority of studies primarily concentrated on evaluating interventions, with limited emphasis on investigating the broader lived experiences of Autistic adults with intellectual disability. Although 24 self-report measures were identified, only two were validated with a sample of individuals with intellectual disability, and less than half of the remaining measures used adaptations (e.g., visual aids or simplified language). Alarming, community involvement was almost entirely absent, with no studies incorporating co-production with autistic individuals.

Conclusions: This review reveals a critical and urgent need for autism research that authentically includes and represents the self-reported perspectives of autistic adults with intellectual disability. It is imperative that future research prioritizes the development and rigorous validation of accessible self-report tools, expands its focus beyond intervention outcomes, and commits to meaningful involvement of autistic individuals throughout the research process. Addressing these gaps is not only essential for building an equitable body of knowledge but also crucial for ensuring that the voices of autistic individuals with intellectual disability are heard and understood in research.

427.093 University Belonging on Canadian Post-Secondary Campuses: The Autism Centred - University Belonging Model

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Background: Higher education is more than academic achievement; it fosters social community, encourages identity exploration, and prepares students for future careers. However, many Autistic students face significant barriers that limit their full participation in university life, including social exclusion, inflexible teaching methods, and a lack of sensory-safe spaces.¹ These obstacles often lead to isolation, anxiety, and depression, affecting up to 70% of Autistic adults.² Research shows that Autistic students who feel a sense of belonging experience increased academic success, lower stress, and develop social and coping skills.^{3,4} Using theoretical models that capture students' experiences and challenges can help identify factors influencing belonging and guide the development of targeted inclusion strategies.⁵ Unfortunately, no models that can enhance Autistic student belonging in university exist, making the University Belonging Model (UBM)⁶ a valuable starting point for redefining/adapting frameworks to better reflect Autistic student experiences.

Objectives: To identify factors that promote belonging for Autistic post-secondary students.

Methods: Our participatory research approach integrated and valued the perspectives of 8 Autistic Community Partners throughout the research process. We analyzed 25 participant responses from our long-answer online survey, which asked participants to recount experiences of belonging (or lack thereof) on campus. Participants were 18 years or older, had a formal autism diagnosis or self-identified as Autistic, and had attended a Canadian university for at least six months. An interactionist approach to disability informed the analysis.⁷ We first separated participants' responses into thought units (i.e., meaningful chunks of text). Then, we used framework analysis⁸ to code the thought units deductively according to the 3 UBM pillars (explained below).⁹ After this, we applied inductive coding within each pillar to uncover nuanced insights into Autistic students' university belonging.⁹ Using interpretive description¹⁰, we ensured our analysis captured the complexity of participants' experiences while remaining grounded in theory.

Results: The first UBM pillar, University Support and Acceptance, emphasizes the importance of accommodating sensory needs, offering accessible support and growth opportunities, and fostering institutional efforts to destigmatize disability. The second pillar, Faculty and Staff Relations, identified how instructional adaptation, the confidentiality of diagnoses, and the presence of neurodivergent staff members contributed to students feeling understood and supported. Our new pillar, Peer Relations, underscored the impact of social perceptions and the need to mask aspects of identity while demonstrating the value of building friendships in fostering a sense of belonging. Unlike the UBM, we found little evidence of University Affiliation—pride and connection to the institution—in the participant's descriptions of their experiences of belonging.

Conclusions: This research highlights that existing models of university belonging may not fully capture the experiences of Autistic students. The innovative Autism-Centred University Belonging Model (AC-UBM) offers critical insights into the factors influencing Autistic postsecondary students' sense of belonging. The AC-UBM provides a helpful framework for improving belonging by addressing peer relationships, sensory needs, and faculty support. Strategies targeting these areas can significantly improve the experiences and well-being of Autistic post-secondary students.

427.094 Using Community Perspectives to Promote Career Success for Autistic Employees

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Background: Autistic adults experience greater joblessness and underemployment than either the general population or people with other disabilities. Improving employment outcomes involves retention, promotion, and career progression in addition to hiring. Increasing employment success for autistic adults requires understanding their needs and priorities, as well as those of their family members, coworkers, employers, and direct support agencies and staff.

Objectives: We aim to use perspectives of stakeholders who contribute to employment outcomes for autistic adults to identify factors related to job retention and career advancement. We focus on the following research questions: (1) How do different stakeholders define successful employment for autistic adults? (2) What do different stakeholders perceive as the barriers and facilitators to successful employment experienced by autistic adults? (3) What do different stakeholders suggest to improve employment outcomes for autistic adults?

Methods: We conducted exploratory interviews with 101 participants focused on identifying barriers to and facilitators of employment success for autistic employees, and the kinds of resources that could support their job satisfaction and performance. Table 1 shows the identities and roles held by participants. Interview transcripts were coded by team members using an iterative process, drawing on previous literature and on themes that emerged in the data. Validation checks were performed to ensure consistency of coding. The team met regularly to develop a shared understanding of codes and themes, and to reach agreement on additional patterns and relationships as they emerged.

Results: We identified multiple themes related to barriers to and facilitators of employment success for autistic individuals, including specific practices; the critical role of employer attitudes; and context and circumstance as mediators. Our analysis revealed that while there is broad agreement on many of the barriers to and facilitators of employment success for autistic individuals, different stakeholders had perspectives that at times diverged from one another. For example, autistic people more often expressed concerns about stereotyping due to reliance on attitudes about autistic people's "special" skills (e.g., technical aptitude or ability to perform repetitive tasks) to facilitate employment. Interviewees also noted that the same practice can be either a barrier or a facilitator depending on the situation. Participants across groups highlighted the need for policy change at both the corporate and government level to facilitate employment of autistic individuals. They stressed the importance of interventions that can improve non-autistic managers' and co-workers' ability to support and work with autistic colleagues, and the role of increasing awareness and acceptance among people who make hiring, retention, and promotion decisions.

Conclusions: Our findings suggest a number of important lessons for research and employment-related interventions and services. First, engaging directly with autistic adults is critical for addressing barriers to employment. Our results also point to the importance of customization and flexibility, and of ensuring that assistance does not preclude self-determination. Finally, our findings emphasize the role of thinking expansively about who needs assistance in order to address the needs of employers and managers and seek solutions to systemic inaccessibility and ableism in the workplace.



427.095 Utilizing Caregiver Perspectives and Experiences to Better Understand the Nuances of the Antecedents, Behaviors, and Consequences of Emotion Dysregulation in Young Autistic Children

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Background: Frustration and emotion dysregulation are found to be more common in young autistic children compared to typical development (Edmunds et al., 2024). Identifying the nuances of emotion dysregulation/regulation and supporting emotion regulation in young autistic children might help reduce future mental health disorders (Waxmonsky et al., 2021). Research demonstrates, both like and unlike non-autistic children, common preceding events (antecedents) of autistic emotionally dysregulated behaviors include transitions, ending preferred activities and exposure to anxiety-provoking stimuli (Cale et al., 2009).

Objectives: We captured the behaviors that indicate emotion dysregulation, and their associated antecedents and consequences (what happens after a behavior) through caregiver interviews to support autistic children during moments of emotion dysregulation and understand differences in emotion dysregulation between autistic and non-autistic children.

Methods: This study included 28 caregivers of autistic children between the ages of 2-5 years ($M = 3y;7m$). Caregivers completed a semi-structured interview via Zoom to report about their child's behaviors associated with emotion dysregulation, and corresponding antecedents and consequences. Using Rapid Qualitative Analysis (Hamilton & Finley, 2019), two research assistants summarized transcripts into a coding matrix, independently and deductively extracted themes, iteratively discussed themes until reaching consensus, and extracted thematic frequencies for content analysis (Hsieh & Shannon, 2005).

Results: Caregivers reported Antecedent themes, such as child being tired (29% of caregivers reported) or hungry (14%), being overwhelmed (14%), overstimulated (14%), transitions and routine changes (43%), not getting their way (32%) or what they want (39%). Caregivers reported a variety of behaviors such as child yelling (71%), crying (64%), throwing self on floor (50%), and throwing/handling objects roughly (32%), banging head against surface (29%), hitting or pushing others (29%), child engaging in full body posturing and stiffness or "going limp" (14%), as well as other behaviors associated with autism characteristics such as spinning (4%) and rocking (4%). Caregivers reported consequences, such as redirection or distractions (68%), physical touch or affection (46%), engagement in deep pressure (14%), child engaging with their comfort items (36%), caregivers "talking it out" with their child (29%), child getting what they wanted (29%), and taking time and space from a situation (25%). Some caregivers also reported engaging in strategies to try and keep the child safe (7%), such as including use of a gentle hold and moving objects out of the way. Caregivers also reported child exhaustion (7%), and lasting effects from moments of dysregulation (7%).

Conclusions: Results indicate consistency with antecedents commonly reported in dysregulation for children with autism based on prior literature. While there are many behaviors and consequence themes associated with characteristics of autism, many themes described could be typical in non-autistic children. Results of this study point to potential emotion regulation strategies parents are using "in real life" that may or may not be part of existing interventions, and therefore could be evaluated for effectiveness. Next steps of this project include comparing reported themes with a non-autistic sample. Results of this study might help develop intervention goals or packages that embrace specific emotion regulation goals for young autistic children.



427.096 Video-Based Autism Education for College Students: Bridging the Gap of Autism Knowledge with Parents of Autistic Children

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Background: Public stigma is the negative perception of individuals who are different (Corrigan & Watson, 2002). Yu and colleagues (2020) have shown that 38% of the public in China endorse stigma, compared to 14% of the USA (Yu et al., 2020). Such culture would make inclusion difficult for autistic individuals including those studying in the colleges. One of the reasons for endorsing stigma toward autism is the lack of knowledge about autism (Underhill et al., 2022; McLeod et al., 2019). A larger proportion of people in China have poorer knowledge about autism, including its causes, symptoms, and long-term consequences, than in many other parts of the world, although Chinese parents have better knowledge than the general public (Harrison et al., 2023; Wei et al., 2022; Yu et al., 2020). Thus, educating the public, specifically the college community, would enhance knowledge about autism, reduce the stigma, and create a more inclusive and supportive environment for autistic students.

Objectives: We first investigated the autism knowledge and stigma toward autism among Chinese college students and compared theirs to those of Chinese parents of autistic children (Study 1). We then examined the effectiveness of video-based training in enhancing college students' autism knowledge and reducing stigma (Study 2). We hypothesized that Chinese college students would have poorer autism knowledge and more stigma than parents (H1), but training would improve their understanding and reduce stigma (H2).

Methods: In Study 1, 101 college students (79 females; mean age = 21.78 years; SD = 2.10) and 104 parents (88 females; mean age = 41.16 years; SD = 5.46) of autistic children were recruited online. The Chinese version of Autism Stigma and Knowledge Questionnaire (ASK-Q; Harrison et al., 2017) was administered. In Study 2, college students from Study 1 received a 35-minute video-based training. The ASK-Q was administered to the students four times: one month before (Time 1), the day before (Time 2), immediately after (Time 3), and one month after training (Time 4).

Results: In Study 1, the students' ASK-Q subscale scores indicated that they had adequate knowledge of autism and did not endorse autism. Yet, their scores on the subscales of etiology, treatment, and stigma were significantly lower than those of the parents (see Table 1). In Study 2, immediately after the video-based training intervention, there was a significant increase in college students' ASK-Q scores in the domains of etiology and treatment, and stigma. Figure 1 displays the changes of students' ASK-Q scores over time. After training, their scores on the subscales of etiology and stigma (Time 3) were comparable to those of Chinese parents. However, one month later (Time 4), their scores on the stigma domain were significantly lower than parents' (see Table 1).

Conclusions: The study revealed that while Chinese college students had adequate knowledge of autism, they scored lower than parents on specific aspects, indicating a need for educational training. A video-based training significantly improved students' understanding and reduced stigma, but some effects diminished over time, underscoring the importance of ongoing education.

**427.097** Voices from the Field: Non-Specialist Workers' Experiences of Delivering a Parent-Mediated Autism Intervention in the Community in Urban India

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Background: The care gap for autism in low-and middle-income countries is high, resulting in limited access to appropriate services. This gap could be addressed through task-sharing, i.e., redistributing healthcare tasks to trained non-specialist workers (NSWs). In India, a systematic approach was adopted to adapt and expand the Preschool Autism Communication Trial (PACT) – a specialist-delivered intervention developed in the United Kingdom – into Parent-mediated Autism Social communication Intervention for non-Specialists (PASS) Plus, with a focus on training a cadre of Accredited Social Health Activists (ASHAs) – female NSWs under India's National Health Mission. After the classroom training, ASHAs undertook an internship, which involved delivering PASS Plus to practice case families, followed by a competency assessment. The Communication Centred Parent-Mediated Treatment for Autism Spectrum Disorders in South Asia (COMPASS) trial was designed as a definitive evaluation of this model, examining the effectiveness and cost-effectiveness of PASS Plus against treatment as usual.

Objectives: To understand the ASHAs' experiences of PASS Plus training and supervision methodology, and their perspectives on feasibility of scaling this model for young children with autism.

Methods: Sample included nine ASHAs who completed PASS Plus training and internship (see Table 1). Seven of these ASHAs achieved competency and delivered PASS Plus in COMPASS trial, out of which one resigned before trial completion. The other two did not achieve competency. Using an exploratory qualitative design, semi-structured interviews were conducted between December 2023 and March 2024 by researchers with Masters in Psychology who had no prior engagement with ASHAs. Transcribed interviews were analyzed on MAXQDA 2020 (VERBI Software 2019) by two researchers collaboratively using inductive approach to reflexive thematic analysis.

Results: Mean age of the ASHAs was 46 years with an average of 11 years of experience in their role. Their highest qualification was post-graduation. ASHAs who achieved competency delivered 62 PASS Plus sessions on an average.

Nine key themes were extracted from the interviews (see Figure 1). Most ASHAs reported that while they were unfamiliar with autism initially, PASS Plus training, supervision and delivery enhanced their knowledge and enabled them to identify and challenge internally held stigmatizing attitudes and misconceptions about disability. ASHAs' familiarity with the community facilitated increased trust towards them, making them a dependable resource for families seeking guidance about their children with autism. It was also noted that while ASHAs can be trained to deliver the intervention at scale, their ability to do so would vary based on their individual skills and motivations.

"If they (ASHAs) decide... they want to help such children... want to do something for these children... they can do it." – (P6)

Conclusions: ASHAs without prior knowledge of autism were trained on PASS Plus and delivered the intervention in the COMPASS trial with high fidelity, highlighting the feasibility of scaling-up the intervention. However, sustainable implementation through existing health and care systems will require addressing stigma around autism and systemic challenges around workload and incentives.



427.098 Voices in Transition: Exploring Stakeholder Roles in ASD Student Transition Planning

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Background: In the U.S., approximately 50,000 adolescents with Autism Spectrum Disorder (ASD) transition out of high school each year (Smith et al., 2023), making this period critical for enhancing adaptive community functioning. Despite federal laws supporting the transition from school to adult services, autistic adults rank second to lowest in independent living among 11 other disabilities (Sandford et al., 2011). Only 14% hold paid jobs, while around half (54%) engage in unpaid activities, and over a quarter (27%) have no work or day activities at all (Roux et al., 2017). In response to these alarming results, stakeholders are increasingly focused on the transition planning process designed to equip students with the skills and resources needed to navigate post-school life successfully (Patton & Kim, 2016). Despite these efforts, interventions aimed at improving postsecondary outcomes have shown mixed results. For example, the Collaborative Model for Promoting Competence and Success (COMPASS), a personalized goal-setting and intervention planning intervention combined with a coaching-based implementation strategy, resulted in significantly higher IEP goal attainment for transition-age youth, but improvements in postsecondary outcomes were not observed (Ruble et al., 2018).

Objectives: The goals of this study are to examine the perspectives, roles, responsibilities and barriers to collaboration among stakeholders, including autistic students, caregivers, teachers, and pre-employment specialists (Pre-ETS). This understanding was used to revise COMPASS Across Settings (CAST) to improve the collaboration among stakeholders and improve the postsecondary goal attainment outcomes of autistic students.

Methods: Four focus groups were conducted with teachers (n=10), caregivers (n=4), and Pre-ETS (n=9) to (a) explore their experience collaborating, (b) understand the feasibility of implementing CAST, and (c) identify potential barriers. The focus group discussions were transcribed, and key themes were identified to guide the development of an initial draft of findings.

Results: Findings revealed that stakeholders play vital roles in facilitating smooth transitions, such as providing resources to all team members and offering extensive longitudinal, contextual knowledge of students. However, challenges such as communication issues, lack of self-advocacy, and limited shared empathy emerged as barriers to effective stakeholder contributions.

Conclusions: The results suggest that teachers bring invaluable professional knowledge and possess a deep understanding of the educational requirements necessary for creating effective transition plans for students. Meanwhile, caregivers contribute contextualized longitudinal knowledge about the students and ongoing support. Pre-ETS offer insights into community and employment options, while teachers bring their specialized knowledge of individualized instruction, accommodations, and the transition IEP. All stakeholders agreed that involving students in the transition planning fosters greater collaboration among the team and promotes a holistic understanding of the students. Three key obstacles were identified including effective communication, student advocacy, and shared empathy. All stakeholders recognized that these challenges impacted their ability to facilitate a smooth transition for students on the autism spectrum.

427.099 What Does It Mean to be Involved with and to Support the Neurodiversity Movement? Many Things to Many People

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Background: The neurodiversity movement (NDM), which advocates for full societal inclusion of neurominorities, has fostered an ongoing sea change in how autism is conceptualized, supported and researched (Chapman, 2024). In early research, neurodiversity awareness was associated with viewing autism as a valuable minority identity (Kapp et al., 2013). More recently, NDM quantitative support/alignment has been associated with reduced stigma among non-autistic people and heightened self-esteem among autistic people (Ferenc et al., 2023; Kim et al., 2023). However, little remains known about what NDM support actually means to people. Closed-ended measures of NDM support/alignment may conflate authentic NDM support and support for neurodiversity-lite, which co-opts ideas from the NDM without addressing the systemic inequalities the NDM challenges (Dwyer et al., 2024).

Objectives:

1. Examine how people describe their involvement with the NDM;
2. Determine if NDM involvement and/or conflicts in involvement vary based on relationships to autism;
3. Explore associations between ratings of NDM support and categories of NDM involvement.

Methods:

Autism community members were surveyed about perceptions of and involvement with the NDM. Respondents self-identified with non-mutually exclusive relationships to autism: autistic ($n = 275$), researcher ($n = 98$), parent/caregiver ($n = 154$), other family ($n = 72$), and other professionals (e.g. clinicians, educators) ($n = 122$). Two masked coders used content analysis to classify 491 open-ended responses to, "Can you say more about your involvement with the neurodiversity movement?". NDM support/identification was self-rated on a 5-item Likert scale adapted from Nario-Redmond et al. (2013). Chi-square analyses are significant at $\alpha = .001$.

Results:

Participants most often described their NDM involvement in terms of level/amount of involvement, visibility, role, and intent (Table 1). When participants described NDM involvement in terms of roles, these often aligned with identities (e.g., professionals more often described involvement through teaching and interventions). Participants also noted conflicts in involvement e.g., in positionality.

Autistic participants more often described being involved with the NDM online while professionals more often described offline involvement.

Autistic participants were more likely to be involved through identity-based groups (e.g., being neurodivergent, having family) and to be involved "when I can" and less likely to be uninvolved. Parents were more likely to not be involved. Autistic people were more likely to be involved through advocacy and less often involved through clinical work. Professionals were more often involved through clinical work, including ABA, and to say they were trying to change ABA.

Among autistic and non-autistic participants, closed-ended NDM support was positively associated with the overarching codes of community, visibility, level/amount, role, and intent of involvement, and negatively associated with conflicts in involvement, as well as many sub-codes.

Conclusions: NDM involvement is much more multidimensional than closed-ended scales convey. Consistent with the history of the NDM (Kapp, 2020), autistic people remain more likely to be involved online and the opposite for professionals. Differences across mediums may magnify miscommunications that foster neurodiversity-lite. However, autistic and non-autistic supporters of the NDM shared common goals and conflicts in involvement. Future work should examine conflicts in relation to intersectionality and lateral ableism.



427.100 What Kind of Virtual Care Is Useful for School-Age Autistic Children? a Qualitative Study of Caregiver Perspectives

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Background:

Despite the increasing popularity of virtual health care for autistic children especially since the pandemic, there remain significant knowledge gaps regarding the barriers, facilitators, and best practices for virtual care for autistic children. An important step to fill the gaps is to understand the recent experiences of virtual care with autistic children, including benefits and challenges compared with in-person care. There have been few qualitative studies that incorporate the voices of caregivers of autistic children regarding virtual care.

Objectives:

As part of a larger mixed-methods and multi-perspective study on the experiences of virtual mental health care for autistic school-age children, this qualitative study aims to understand the needs of autistic children from the perspectives of their caregivers regarding virtual care.

Methods:

A total of 20 caregivers of autistic children (aged 5-12 years) living in Canada who had experienced virtual mental health care participated in in-depth individual interviews. Interview questions centered on caregiver perspectives and experiences with their autistic children's virtual care, and how these experiences compared to the experiences with in-person care. Facilitators and barriers to virtual care tailored to autistic children were specifically inquired. Interview data were transcribed verbatim. Data analysis, guided by an inductive thematic analysis approach, was assisted by NVivo. The team read the transcripts to identify emerging ideas and discussed and identified codes. These codes were refined iteratively to inform the identification of themes.

Results:

Initial analyses from 13 interviews identified two primary candidate themes: "A delicate balance of familiarity" and "(Not) worth the effort". First, it was found that if elements of the virtual care sessions were familiar to the autistic children (e.g., with familiar peers and clinicians, and structured lesson plans), and clinicians were familiar with the children (e.g., being able to tailor the sessions to match with the children's needs and preferences), it was more likely that the children would benefit from virtual care. Meanwhile, however, too much familiarity might yield negative impacts as caregivers also identified the importance of novelty and creativity in virtual care for successful engagement of their autistic children. Secondly, while several advantages of virtual care were identified (e.g., convenience, no need for commute), the majority of caregivers did not feel that the benefits outweighed the significant efforts (e.g., ensuring readiness of tools, helping their children continue the care by sitting next to them during the whole session) required to help their children engage in virtual care. In fact, many caregivers shared negative feelings towards virtual services, such as feeling overwhelmed, frustrated, and useless, and most caregivers expressed that virtual care were less preferred as compared to in-person services. Data analysis is ongoing with the remaining interviews, and full results will be presented at the conference.

Conclusions:

While virtual care is likely not a panacea, it is important to understand the elements for effective care provision. Different aspects of virtual care should have an optimal balance in familiarity and novelty to enhance engagement, and caregivers' perceived burden and barriers should be addressed.

427.101 When Design Makes You Sick: Physical, Emotional and Practical User Experiences with Navigating Daily Life Data Visualisations

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Background: The growing presence of data in our daily lives highlights the importance of making information visually accessible and easy to understand. Despite a growing body of research focused on designing accessible visualisations, autistic people have been largely overlooked in the design process, which may impact wellbeing and daily living. Autistic people often describe their cognitive and perceptual experiences, such as sensory responses, visual motion processing, and detail-focused thinking styles, as being distinct from neurotypical approaches. The needs and experiences of Autistic adults in order to create accessible visual design practices and guidelines.

Objectives: Our aim was to design more inclusive and effective data visualisation tools that enhance both comprehension and emotional well-being. This study explored how Autistic people experience and interpret data visualisations, by identifying specific strengths, challenges, needs, and preferences they encounter when interacting with real life examples of visualised data. Our research went beyond improving the clarity of visualisations to consider also the emotional and daily impact that visuals may have on Autistic people.

Methods: We employed a mixed-methods approach, combining surveys, user studies, and semi-structured interviews. The initial survey gathered demographic data, Autism Spectrum Quotient (AQ short) scores, and an overview of participants' experiences with data visualisations. Following this, participants took part in user studies featuring both static and interactive web-based visualisations, which measured the accuracy and efficiency of task performance. Semi-structured interviews were then conducted to gain deeper insights into participants' experiences, and the data were analysed using reflexive thematic analysis (Braun and Clarke, 2019). Reflexive thematic analysis was undertaken by a non-autistic researcher, with codes and themes confirmed by consensus with an autistic researcher.

Results: A total of 65 participants initially responded to the survey, with 33 participants (16 diagnosed autistic, 1 identifying as autistic, and 16 non-autistic) completing the user study and interview stages. Participants represented diverse levels of independence, education, and autism traits, ensuring that a broad range of experiences was captured.

Our reflexive thematic analysis identified seven themes: usability and accessibility, physical and emotional user experiences, strategies for managing responses, problems with accessible adaptations, strategies for understanding and interpreting data, impacts on daily living, and user needs and suggestions. Emotional and physical responses to data visualisations were prominent, often resulting in visceral reactions. Strategies for managing these responses varied, with participants adjusting screen settings or avoiding certain visualisations altogether, though not all strategies were effective. Participants expressed how these challenges impacted daily living, work, and learning, leading to missed opportunities in some cases. Participants expressed how these challenges impacted daily living, work, and learning, leading to missed opportunities in some cases. Participants provided valuable improvements for creating accessible visualisations, highlighting the importance of simplicity, reducing movement, and customisability.

Conclusions: How data and information is visually presented in daily life significantly impacts education, work and daily living for Autistic adults, in ways that do not impact non-autistic adults. Our findings provide the groundwork for extending guidelines for creating accessible data visualisations that benefit not only the Autistic community, but the broader population.

427.102 Who Am I: The Balance between Masking and Identity

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Background: Autistic people experience worse mental health outcomes than non-autistic people. Masking (concealing autistic traits) is found to relate to poor mental health. Research shows autistic people indicate relationships between masking and difficulties creating or maintaining a sense of identity. Personal identity is rarely studied within autism research. This study aims to bridge this gap by exploring the connection between identity formation difficulties (both social and personal), and its impact on poor mental health in autistic people. It examines levels of identity conflict and distress in autistic and non-autistic people and whether identity distress mediates and identity conflict moderates the relationship between masking and psychological distress.

Objectives: This study looked at the potentially disruptive nature of masking on identity development in the autistic community and the implications of such disruption on mental health outcomes.

Methods: Data were collected for autistic ($n = 139$) and non-autistic people ($n = 133$) using an online survey (JISC).

Results: Autistic people were found to experience higher levels of identity distress ($M = 23.41$, $SD = 6.25$) than non-autistic people ($M = 17.05$, $SD = 5.96$), $F(1, 255) = 75.92$, $p < .001$, $\eta_p^2 = 0.40$, identity conflict ($M = 10.45$, $SD = 2.69$ vs. $M = 6.98$, $SD = 3.40$), $F(1, 261) = 90.11$, $p < .001$, $\eta_p^2 = 0.27$, and psychological distress ($M = 23.41$, $SD = 6.85$ vs. $M = 17.05$, $SD = 5.96$), $F(1, 260) = 88.87$, $p < .001$, $\eta_p^2 = 0.36$. Identity distress represents a full mediation of the relationship between masking and psychological distress in the autistic cohort (mean bootstrapped indirect effect = 0.18, 95% CI = 0.08, 0.28), $k^2 = 1.79$, but a partial mediation in the non-autistic cohort (mean bootstrapped indirect effect = 0.30, 95% CI = 0.21, 0.39), $k^2 = 0.50$. Identity conflict did not moderate any relationships within the model for either cohort. However, it did have a significant direct relationship with each variable.

Conclusions: These findings suggest that autistic people may experience worse mental health outcomes due to difficulties with cohesive identity formation. Additional research into the role of autism in identity development may identify other areas in which identity difficulties negatively impact autistic people, such as long-term planning and suicidality.

**427.103 Young Adults' Sibling Relationship Quality, Links with Autism Diagnosis, Autistic Identity, and Autistic Traits**

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Background:

Sibling relationships are important across the lifespan, especially for those with autism spectrum disorder (ASD; Hendricks & Wehman, 2009). Past research, however, suggests that when one sibling has ASD, relationship quality tends to be lower (Hastings & Petalas, 2014; Orsmond et al., 2009). These studies have one major limitation; they largely rely on the perspectives of non-autistic siblings. How do autistic individuals feel about their sibling relationships? Additionally, past studies have also largely focused on cases where the autistic sibling has been clinically diagnosed with ASD. The growing neurodiversity movement suggests that an overreliance on clinical diagnoses misses the real experiences of those who identify as autistic or even have a higher level of autistic traits (Kapp et al., 2013). Do those who have been clinically diagnosed with ASD report different sibling relationship experiences than those who have not been diagnosed but identify as autistic or display higher levels of autistic traits?

Objectives:

The objective of the current study is to examine the perspectives of young adults on their sibling relationships. Specifically, we examined the perspectives of non-autistic young adults, those diagnosed with ASD, those who identify as autistic, and those who are high in autistic traits.

Methods:

Participants for this study were collected via Prolific (www.prolific.co). Participants were young adults, ages 18-29 (M age = 24.61, $SD = 2.90$; 50.42% female; 63.07% White), who resided in the United States and had at least one living sibling. Participants provided demographic information about themselves (including ASD diagnoses and autistic identity) and their closest aged siblings, their sibling relationship quality using the Emerging Adults Relationship with Siblings Scale (Jensen et al., 2023), and their autistic traits using the Autism Quotient (Baron-Cohen et al., 2021).

Results:

Using ANCOVA, we examined group differences of sibling closeness and conflict between non-autistic participants ($N=720$), participants diagnosed with ASD ($N=97$), participants who self-identified as autistic but were not diagnosed with ASD ($N=80$), and participants high in autistic traits based on the Autism Quotient but did not identify as autistic and had not been diagnosed with ASD (Baron-Cohen et al., 2001; $N=67$). Non-autistic participants reported greater sibling closeness and lower sibling conflict than all other groups. All other groups were not significantly different from one another.

Conclusions:

Young adults with ASD, or who identify as autistic, or who have higher levels of autistic traits, report lower relationship quality than non-autistic young adults. The relational experiences of different autism groups may be driven by autistic traits rather than by clinical diagnoses or identities. Discussion will focus on perceptions of sibling relationships of individuals with ASD and challenges they may face in those relationships compared to non-autistic individuals.

427.106 Socioeconomic Status and Families' Cultural Characteristics Influence the Time of Suspicion for Autism: Results from a Structured Study.

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Background:

Research suggests that families' education and economic status together with cultural perceptions of autism, can affect parents' recognition of the first signs of autism in their children and influence their decision to seek medical help for ASD suspicion. No specific studies in this regard have been conducted in Italy.

Objectives:

The focus of this pilot study is the association between age at first medical contact for diagnostic suspicion and parental characteristics in Lombardy Region, the most populous and rich Region in Italy.

Methods:

Forty-nine ASD cases referred to our Institute for Rehabilitation from 2022 to 2024 coming from Lombardy municipalities were included in the study. The age at first medical contact for parental concern, determined from parents' reports, was the prediction target. Child gender and age at presentation in our Centre, mother, and father age at childbirth, their education achievement level, their occupation level, and their place of birth (North, Centre, South Italy, Foreign country) were used for input data.

The existence of a poor linear correlation between features and targets prompted us to use a machine-learning system approach. The evolutionary algorithm TWIST was used to subdivide the dataset into training and testing sets as well as to select features yielding the maximum amount of information. After this pre-processing, 11 out of 18 input variables were selected and different machine learning systems were used to develop a predictive model based on a training-testing crossover procedure able to distinguish subjects lying in the two classes of age at first medical contact (<36 months vs >36 months). A fourth- generation artificial neural network called Auto-CM coupled with a minimum spanning tree filter developed a semantic connectivity map of the 20 variables on study (figure1).

Results:

The study group was composed of 33 males and 16 females (mean age at presentation 7.5 yrs; range 2-15 yrs) diagnosed with autism according to DSM V criteria. The age at first medical contact for parental concern ranged between 6 months and 8 years (mean 38 months). TWIST systems selected 11 variables (Child age at observation, parents' education and occupational level, parents place of birth). A machine learning model using these variables predicted class age at first contact with an overall accuracy of 88.65% (sensitivity 93.5% - specificity 83.7%) with a ROC/AUC = 0.85. Higher socio-economic status and north parental origin were associated to a later age at first contact.

Conclusions:

The educational professional and cultural background of parents play a substantial role in influencing the decision to seek medical help for ASD suspicion in a complex way. A machine learning model built on study variables predicted class of age at first contact with high accuracy.

**427.107 Qualitative Analysis of Sleep Disorders in Parents of Children and Adolescents with Autism.**

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Background:

Several studies have reported disturbed sleep patterns (e.g. frequent nocturnal awakenings, morning wakefulness, and overall shorter sleep times) in children with autism spectrum disorders (ASD). Since almost all these sleep disturbances are reported by parents, it is logical to assume that the parents' sleep patterns are also disturbed, resulting in poorer sleep quality and quality of life. No study so far has included a validated self-assessment measure of sleep quality in parents of children with ASD.

Objectives:

The purpose of this exploratory study is to examine sleep quality and sleep-wake patterns in parents of children with ASD in comparison with parents of typically developing children matched for age and gender.

Methods:

Parents of 29 children and adolescents with autism (21 males; 8 females; age range: 4-17; mean age 10.9 years) were involved in the study. Twenty-three out of 29 subjects with autism had level 3 severity according to DSM V. Principal caregivers who took part in the study were 13 fathers and 16 mothers (age range 30-52 years). They were asked to fill out the Pittsburgh Sleep Quality Index questionnaire -validated Italian version- consisting of 19 questions and 7 dominions (subjective evaluation, latency, duration, efficacy, disturbances, hypnotic use, daily dysfunction).

The control group was represented by parents (9 males and 14 females- age range 29-58 years) of 23 typically developing (TD) kids (13 males; 10 females; age range 3-15 years mean age 9.8 years).

To graphically show the most important connections among the variables a fourth-generation artificial neural network called Auto-CM coupled with a minimum spanning tree filter developed a semantic connectivity map of the variables in the study (Figure).

Results:

The map developed by the Auto-CM system clearly shows a separation between the two groups' sleep qualities. The node of parents of the ASD group was directly connected with short sleep duration, linked to scarce sleep efficacy and in sequence high sleep latency, subjective evaluation of sleep poor high sleep disturbances, and dysfunction during the day (figure). The low scores of seven dominions were connected to parents of the Control group starting with normal sleep duration.

Conclusions:

Our study confirms that parents of children with ASD have poorer sleep quality and more disturbed sleep patterns than parents of TD children.

**427.108 Training Law Enforcement about Autism: Increased Knowledge and Confidence Responding to Calls**

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Background: In the United States (US), research supports the general population's knowledge and beliefs about autism is limited (Golson et al., 2022), and those with little knowledge are often unaware of their own ignorance (McMahon et al, 2020). The importance of autism knowledge within certain professions is recognized, but does not necessarily result in professional training. Gardner et al. (2019) found the majority of Law Enforcement Officers (LEOs) have no formal training about autism, despite working in a state that requires such training. It is currently estimated in the US that 1 in 36 children have a diagnosis of autism (Maenner et al., 2023), and 1 in 45 adults have autism (Dietz et al., 2020). As such, it is not surprising that LEOs report interacting with autistic individuals in their professional role. These interactions include responding to calls for elopement, unusual behaviors, suspected abuse/neglect, or disruptive behavior (Gardner et al., 2019). In addition, LEOs respond to calls for victimization including assaults, bullying, and other mistreatment (Pfeffer, 2016). Rava et al. (2017) found that by age 21, approximately 20% of autistic individuals reported having been stopped and questioned by LEOs, and nearly 5% had been arrested.

Objectives: The aim of the study is to assess the impact of a training for LEOs on their perceived knowledge of autism and their confidence in responding to autism related calls. Training content included an interactive presentation and virtual reality.

Methods: Four-hundred and one ($N = 401$) sworn LEOs attended ten separate training sessions. LEOs were 82.0% male with a mean age of 41.07 years ($SD = 10.04$) and 13.61 years of law enforcement experience ($SD = 9.57$). Most LEOs ($n = 279$; 69.6%) reported no prior autism training. Each participant completed a pre- and post-training questionnaire assessing perceived knowledge of autism and confidence in responding to calls.

Results: LEOs reported increases in their knowledge of autism from pretest ($M = 2.59$; $SD = 0.8$) to posttest ($M = 4.03$; $SD = 0.7$; $t(343) = 29.20$, $p < .001$). Similarly, LEOs reported increases in their confidence in responding to calls from pretest ($M = 18.57$; $SD = 5.2$) to posttest ($M = 27.48$; $SD = 3.9$; $t(377) = 32.30$, $p < .001$). Likewise, 91.3% of LEOs ($n = 396$; 98 of the sample) reported the training would positively impact their professional interactions with autistic individuals. LEOs without prior autism training and without a prior relationship with an autistic individual reported greater increases in knowledge and confidence; gender, age, and years of experience did not predict knowledge or confidence increases.

Conclusions: Combined in-vivo and virtual reality training was associated with increased knowledge and confidence in responding to calls for LEOs. LEOs without prior autism training and those without a relationship with an autistic individual reported greater changes in knowledge and confidence. Future research should investigate the long-term impacts of autism training on LEO behavior and call outcomes from the perspective of both LEOs and autistic civilians.

427.109 Law Enforcement Officers' Anti-Stigmatizing Autism Beliefs: Predictors and Response to Training

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Background: In the U.S., it is currently estimated that 1 in 36 children are autistic (Maenner et al., 2023), and 1 in 45 adults have autism (Dietz et al., 2020). With these prevalence rates, it is not surprising that law enforcement officers (LEOs) report interacting with autistic individuals in their professional role. For example, Rava et al. (2017) found that by age 21, approximately 20% of autistic individuals reported having been stopped and questioned by LEOs, and nearly 5% had been arrested. LEOs report limited knowledge about autism, which is associated with improved knowledge as a result of training (e.g., Gardner & Campbell, 2020). Similarly, LEOs report improved confidence in responding to autism-related calls (e.g., Gardner & Campbell, 2024). To our knowledge, no study has investigated stigmatizing attitudes reported by LEOs and if such attitudes are responsive to training.

Objectives: The aims of the study are to: (a) evaluate changes in anti-stigma autism attitudes associated with a training experience for LEOs, and (b) identify predictors of LEO's anti-stigma autism attitudes.

Methods: Two-hundred and nine ($N = 209$) sworn LEOs attended five separate training sessions about autism. The training consisted of a four-hour workshop presentation which includes a virtual reality component (Gardner & Campbell, 2024). LEOs were 75.6% male with a mean age of 40.86 years ($SD = 10.7$) and 13.86 years of law enforcement experience ($SD = 10.7$). Most LEOs (64.1%) reported no prior autism training and 33.3% reported having a personal relationship with an autistic individual. Before and after the training session, each participant completed the Autism Anti-Stigma (AAS) measure, a 10-item scale measuring anti-stigmatizing attitudes towards autistic individuals, with higher scores indicated more favorable attitudes about autism (VanDaalen et al., 2024).

Results: LEOs reported increases in their anti-stigma attitudes from pretest ($M = 38.43$; $SD = 5.5$) to posttest ($M = 39.50$; $SD = 7.3$; $t(179) = 2.21$, $p < .01$). Linear regression analysis with gender, age, prior training, personal relationship, and years of experience predicting AAS pretest scores, resulted in a significant model, $F(5, 171) = 5.36$, $p < .001$. Only gender emerged as a significant predictor ($\beta = .31$; $p < .001$), with female LEOs endorsing higher anti-stigma attitudes ($M = 41.88$; $SD = 4.5$) when compared to male LEOs ($M = 37.5$; $SD = 5.3$). The set of variables also significantly predicted AAA posttest scores, $F(5, 167) = 2.61$, $p < .01$, with gender emerging as the sole significant predictor ($\beta = .24$; $p < .01$). The variables did not predict change in anti-stigma attitudes, $F(5, 160) = 0.25$, $p = .94$.

Conclusions: Combined in-vivo and virtual reality training was associated with increased anti-stigma autism beliefs. Female LEOs reported higher anti-stigma attitudes before and after the training when compared to male LEOs. Future investigations should explore relationships between LEOs' anti-stigma attitudes about autism and responses to calls involving autistic individuals. [Word count = 475].

427.110 Teachers' Self-Efficacy in Teaching/Supporting Autistic Pupils in Mainstream Schools in England: Impact of Knowledge of Autism, Prior Training and Experience

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Background: Many autistic pupils think that schools would be better places when their teachers understand them (APPGA, 2017). Teachers' knowledge and understanding of autism and self-efficacy are related to more inclusive practices (Woodcock et al., 2022) and decreased risk of teacher burnout (Ruble et al., 2011). Professional development (PD) may play a promising role in improving teachers' understanding and self-efficacy. Understanding teachers' current level of knowledge and self-efficacy level, along with variables affecting them, is important to provide better support to teachers and to improve autistic students' school experiences.

Objectives: This study investigates a) general education (mainstream) teachers' knowledge of autism and their self-efficacy levels in teaching and supporting autistic students along with group differences based on teaching role, school level, PD experiences, and exposure to autism training in initial teacher education (ITE), and b) variables associated with teacher self-efficacy, including autism knowledge, age, prior training experience (e.g. ITE and PD), teaching roles, school level, and years of experience teaching autistic pupils.

Methods: A cross-sectional survey was conducted between March and May 2024 in England with mainstream teachers through an online survey on Qualtrics. The Knowledge of Autism Questionnaire-UK (KAQ-UK; Langhorne et al., 2024) and Teachers' Self-Efficacy for Autism Scale (TSEAS; Love et al., 2019) were used to measure teachers' autism knowledge and self-efficacy, respectively. Of the 524 consenting participants, 511 mainstream teachers completed the KAQ-UK, while 492 participants completed the TSEAS.

Results: Special Educational Needs Coordinators (SENCOs), who are specialist teachers coordinating support for students with SEND in mainstream schools, demonstrated significantly higher knowledge of autism ($n=178$, $m=27.7$, $p<0.001$) and self-efficacy ($n=170$, $m=40$, $p<0.001$) compared to other teachers ($n=333$, KAQ-UK $m=24.2$; $n=322$, TSEAS $m=38$). Teachers with no PD experience scored significantly lower than teachers with PD experience on The KAQ-UK ($p<0.05$), and self-efficacy levels generally increase as the number of PD increases. Teachers who received autism content in ITE had significantly lower knowledge of autism than those who did not receive autism training in ITE ($p<0.05$) but the effect size was small, and there were no significant group differences in self-efficacy ($p>0.05$). Self-efficacy correlated positively with knowledge of autism ($r=0.227$), years of experience in teaching autistic pupils ($r=0.163$), and number of PD attended ($r=0.309$). Regression analysis indicated that age, years of experience teaching autistic pupils, and knowledge of autism are significant predictors of teachers' self-efficacy. Some PD types, while not statistically significant, were close to significance, suggesting their potential value.

Conclusions: The higher knowledge of autism and self-efficacy scores among SENCOs and the significance of teaching experience as predictors of self-efficacy suggest that specialist training and direct experience with autistic students are crucial factors in teacher development. The fact that ITE training and the number of PD attended did not predict self-efficacy may suggest that the design features of PD and their alignment to teachers' professional backgrounds and needs may be more critical than quantity.

427.111 Mechanisms and Effectiveness of Autism-Specific Teacher Professional Development Programs on Teacher or Student

Outcomes: A Systematic Review

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Background: Inclusive education requires teachers who can support each pupil regardless of their diverse needs. Autistic students' unmet needs and statements of teachers' professional support needs are still being reported. However, the best way of providing professional development (PD) is still not under consensus, and there is a clear need for an evidence-based PD framework.

Objectives: To examine the research evaluating autism-specific PD programs 'delivered to in-service mainstream teachers and analyse the mechanisms of these PD attempts with their impact on teacher and student outcomes.

Methods: A systematic search of the literature was conducted in August 2023 using the databases Scopus, Web of Science, PsycINFO and ProQuest (ERIC, Education Database, Dissertations & Theses) and Ebsco (British Education Index). A testable PD framework (IGTP framework or balanced design PD framework) was used in this systematic review of randomised and controlled studies as an organiser framework.

Results: The primary researcher screened titles and abstracts of 2346 studies against the inclusion/exclusion criteria. After full-text screening of 156 studies, 5 studies met the inclusion/exclusion criteria. Results showed that only one study had included mechanisms from all four goals (Insight, Goal, Technique, Practice) of the balanced design PD framework, and it had a greater impact on the cognitive, language, social and behavioural outcomes of students in the experimental group compared to the comparison group. However, studies coded with fewer mechanisms also reported a positive impact on the measured outcomes. Overlapped measured outcome was teacher self-efficacy.

Conclusions: Limited randomised controlled studies made differentiating between more and less effective mechanisms impossible. However, there are overlapped mechanisms between the proposed balanced design PD and the two studies' PD intervention, which reported positive outcomes. High-quality PDs are needed to support teachers in teaching/supporting autistic pupils. Therefore, more randomised controlled studies are needed to examine causalities between mechanisms and PD programs' impact and test the balanced design PD framework.

427.112 Predictors of Parental Stress in Mothers and Fathers of Autistic Children

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Background: Robust findings demonstrate that parents of autistic children experience high levels of parenting stress that are associated with negative outcomes for families (1). One of the important factors affecting parental stress in parents of autistic children is gender of the parent (2, 3). Some studies indicate that the factors affecting parental stress in mothers and fathers may differ from each other (4).

Objectives: In this study, we aimed to investigate whether there is a difference between the factors predicting parental stress in mothers and fathers of autistic children.

Methods: Mothers (n=140) and fathers (n=97) of autistic children between the ages of 2-11 years participated in this study. Participants were asked to fill out Parent Stress Scale (PSS), Depression Anxiety Stress Scale-21 (DASS-21), Autism Quotient - 10 (AQ-10: to assess parental autistic traits), Social Responsiveness Scale (SRS: to determine the level of autistic symptoms of children), and Aberrant Behavior Checklist (ABC: to determine behavioral problems of children).

Results: The results revealed that mothers perceived significantly higher levels of depression ($p=0.000$), stress ($p=0.000$), anxiety ($p=0.000$), and parental stress ($p=0.000$) than fathers. Mothers' SRS scores were significantly higher than fathers, indicating higher autistic symptoms in their children ($p=0.01$). There was no significant difference between mothers and fathers in terms of AQ-10 and ABC scores. The factors predicting parental stress in mothers were the severity of autistic symptoms of the child ($B=0.051$; $p=0.019$), behavioral problems of the child ($B=0.053$; $p=0.044$), and autistic traits of the mother ($B=0.647$; $p=0.03$), while the factor predicting parental stress in fathers was the level of depression of the fathers ($B=0.368$; $p=0.000$) (Table 1).

Conclusions: A clearer understanding of the divergent pattern of determinants of parenting stress across genders and using this to develop tailored support programs would have a clear practical benefit.

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3- Leonardi E, Cerasa A, Servidio R, Costabile A, Famà FI, Carrozza C, Spadaro L, Scifo R. The Route of Stress in Parents of Young Children with and without Autism: A Path-Analysis Study. *Int. J. Environ. Res. Public Health* 2021, 18, 10887.

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427.113 Turkish Validity and Reliability of Parental Stress Scale in Parents of Autistic Children

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Background: Parental stress refers to the emotional strain that emerges from the demands linked to the parenting role. Research has shown that parents of autistic children tend to experience higher levels of stress compared to parents of typically developing children or even those with other disabilities (1). This issue is particularly significant because elevated parental stress is associated with decreased effectiveness in parent-mediated interventions (2). Psychological stress and burnout in parents of autistic children have been linked to increased levels of depression, anxiety, and a decline in family cohesion, which may, in turn, reduce their caregiving capacity (3). Therefore, developing reliable, accessible, and easy-to-administer measures of parental stress is crucial for expanding our understanding and improving interventions.

Objectives: The aim of this study was to assess the psychometric properties of Parental Stress Scale - Turkish Version (PSS-TV), as completed by mothers and fathers of autistic children aged 2 to 11 years.

Methods: The participants in this study were parents of autistic children, aged between 2 and 11 years, including 140 mothers and 97 fathers. The validity of the scale was examined using exploratory factor analysis. Reliability was assessed through Cronbach's alpha, item-total correlation, test-retest analysis and by examining the difference between the top and bottom 27% of the scale's scores.

Results: In the first exploratory factor analysis, two items (items 6 and 12) in the 15-item scale were removed from the scale because they loaded on two factors at the same time and the factor loadings between them were less than 0.10. In the EFA conducted after the two items were removed from the scale revealed three dimensions underlying parental stress: Burdensome (Factor 1, $\alpha=.80$), rewarding (Factor 2, $\alpha=.79$), and consuming. (Factor 3, $\alpha=.51$) (Table 1). The PSS-TV demonstrated good internal consistency ($\alpha=.81$), while the test-retest reliability was moderate ($ICC=.675$). There is a significant difference between the top and bottom 27% of the scale scores ($m1:45,01$ $m2: 26,32$ $p=0.000$). The scale showed the expected correlations with DASS-21- Stress subscale ($r=0.56$).

Conclusions: In conclusion, our findings support the reliability and validity of the PSS-TV, suggesting it to be a valuable tool for measuring parental stress in a Turkish context. Furthermore, our results emphasize the importance of addressing parental stress and associated needs during assessments and when planning interventions for families with autistic children

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427.114 Barriers and Facilitators to Primary Healthcare Encounters As Reported By Autistic Adults: A Qualitative Study

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Background: Primary care is designed to co-manage health concerns, contribute to preventive care, and provide medical care coordination. Receiving primary care may be especially vital for autistic people, many of whom disproportionately experience psychiatric and physical health conditions. However, autistic adults often face barriers to receiving primary care, and first-hand accounts of these challenges are limited.

Objectives: Therefore, the purpose of this study was to describe barriers and facilitators to primary care encounters as reported by autistic adults.

Methods: Interviews were conducted with 34 autistic adults in Los Angeles and Philadelphia, lasted an average of 26 minutes, were transcribed verbatim, and analyzed using thematic analysis. This dataset is part of a larger study that interviewed autistic adults, caregivers, and primary care providers (PCPs).

Results: Participants had a mean age of 32 years and were primarily White and non-Hispanic; 22% of participants self-identified as an under-served race/ethnicity. Five overarching themes describing challenges and potential strategies to improve care emerged from the interviews: (1) finding a primary care provider, (2) the physical environment, (3) communication, (4) autism-specific knowledge, and (5) support for primary care encounters, *while simultaneously highlighting* the importance of tailoring care for autistic adults to improve primary care experiences. Results, specifically in the communication and autism-specific knowledge themes, were consistent with the neurodiversity model of autism, as participants highlighted stigma and mutual communication as key healthcare barriers.

Conclusions: Findings provide a nuanced understanding of autistic adult participants' primary care experiences, highlighting their perception of barriers and facilitators to these healthcare encounters. These results offer valuable insights for improving the accessibility and quality of care for autistic people, many of which are practical, low/no cost, and easy to implement. Strategies also emphasized the diversity of experiences and preferences for autistic patients, highlighting the importance of tailoring accommodations in the primary care setting.

427.115 Afirm for Paraeducators: Increasing Knowledge of Evidence-Based Practices for Paraeducators

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Background: While federal law requires training and professional development for paraeducators, the detailed review of state requirements by Massafra et al., (2020) revealed that 43 states do not require initial training and 40 states do not have provisions for ongoing professional development. Overall, paraeducators report lack of time and appropriateness of training offered as barriers to professional development (Morin et al., 2022) despite paraeducators becoming increasingly responsible for instruction of autistic children in US schools. These findings highlight the significant gap in professional development for paraeducators and their supervising teachers. With the purpose of introducing core evidence-based practices to paras, a core set of modules were designed using innovative instructional design technology. This resulted in six interactive modules (introduction to autism, reinforcement, prompting, time delay, visual cues, and supporting peer interactions) that are short, self-paced, and flexible (i.e., to allow for the variety of para and teacher schedules) and reflect the most innovative design methodology currently available. These modules are free and publicly available.

Objectives: This study aims to explore the knowledge gain when paraeducators use the AFIRM for Para modules and the social validity of the modules.

Methods: Users completed a pre-test and post-test and an evaluation of the modules. Each test had ten questions and was scored on a 100-point scale. The evaluation focused on the quality, relevance, and usefulness of the modules and was based on a Likert-type scale four-point rating scale, with four being the highest rating.

Results: A total of 68,635 users have accessed the AFIRM for Paraeducator modules with the majority being paraeducators (29,253). Users have completed a total 141,312 modules with introduction to autism being the most accessed modules (n = 38,635) and supporting peer interactions the least accessed modules (n = 7,008). Users had the highest mean scores at pretest for introduction to autism (n=38,635, mean = 77.84, SD 16.41) and lowest mean scores at pretest for time delay (n=9,604, mean = 45.88, SD 19.5). To determine knowledge gain, a paired sample t-test was conducted on the pretest and post-test taken by users. Significant change from pre-test to post-test occurred for all practices at the p<.001 level. Standardized mean differences (ES) were computed for each practice using Cohen's d formula. The mean ES was 0.46 (CI 0.46-0.47) with ESs among individual practices from 0.66 (CI 0.637-0.674) for prompting to 0.46 (CI 0.45-0.47) for introduction to autism. All modules were rated as high quality (mean = 3.57, SD 0.56), relevant (mean = 3.57, SD 0.62), and useful (mean = 3.55, SD 0.62).

Conclusions: The AFIRM for Para modules provide a mechanism for paraeducators to access professional development on evidence-based practices for autistic students, and could serve as a cost-effective tool to provide initial training for professionals supporting autistic children. Users (including paraeducators) find these modules socially valid. Additional work is needed to examine how paraeducators will then use this knowledge in classrooms working with autistic students.

Poster Session

428 - Cognition: Attention, Learning, Memory II

May 2nd, 2025, 6:00 PM - 7:00 PM - Hall 4A

428.116 Little Correlation between Parent and Teacher Ratings of Executive and Adaptive Functioning, Whether for Children with or without Autism Spectrum Disorder

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Background: There have been studies exploring the consistency between parent's and teacher's assessments of numerous domains of functioning for children with autism spectrum disorder (ASD). However, little research has examined the potential discrepancy of such parent-teacher consistency between typically developed children and those with autism spectrum disorder.

Objectives: The current study aims to investigate if a parent's ratings on adaptive function and executive function can predict the same ratings by teachers, and if the predictability varies and depends on whether the children are typically developed or have been diagnosed with ASD.

Methods: We recruited children aged between 6-12 years old and FSIQ > 80. For children in the TD group, the exclusion criteria were having been diagnosed with any chronic diseases or mental diseases. Children in the ASD group must have been diagnosed with ASD by a psychiatrist or a clinical psychologist. The exclusion criteria for children in the ASD group were having been diagnosed with intellectual disability, seizures, or Tourette's syndrome. Finally, there were 19 children in the TD group (mean age = 9.34 years; SD = 1.32) and 24 children in the ASD group (mean age = 9.62 years; SD = 0.93) in the current study. All participants were boys. The researchers used BRIEF-2 (Behavior Rating Inventory of Executive Function, Second Edition) to assess executive function and Vineland-3 to assess adaptive behaviors.

Results: To test the background level first, there was no difference between TD group and autism group in child's chronological age, mother's age, mother's educational level, father's age, and father's education level. Next, we examined if the parent's ratings can predict teacher's rating and if the group (TD v.s. Autism) would moderate the effect. The results showed that, among the 4 main scores (Global Executive Composite [GEC], behavior regulation index [BRI], emotion regulation index [ERI], and cognitive regulation index [CRI]), only parent's CRI predicted teacher's CRI and there was no group main effect or the interaction effect between group and parent's ratings in predicting teacher's rating. It means the effect of parent's ratings' predicting teacher's ratings didn't vary because of their groups. For adaptive function, parent's ratings effectively predicted teacher's ratings on the adaptive behavior composite, daily living skills, and socialization, but not communication. However, for the two maladaptive behaviors indices, parent's ratings didn't predict teacher's ratings. Moreover, for all indices, there was no group effect or the interaction effect between group and parent's ratings.

Conclusions: In the assessment of adaptive behavior and executive function, it seems the consistency between parent's and teacher's ratings does not vary based on whether the child is diagnosed with autism or is a typically developing child. However, this is not entirely because of the assessment being invariant and working to the same degree for both groups, but often because – as we found – parent and teacher ratings are correlated for neither group. We therefore suggest extending the research to more cognitive-behavioral domains and raters of more social roles in the future.

428.118 Modulation of Social Attentional Differences By Gaze Direction in Infants and Toddlers with and without ASD: A Longitudinal Study

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Background:

Social attention is a dynamic construct that evolves throughout infancy and toddlerhood, with developmental trajectories that are often nonlinear. The variability in ASD presentation—where some children exhibit clear signs of social attention difficulties early on, while others show significant differences later—complicates the identification of specific developmental milestones that reliably predict ASD across all children. Therefore, understanding how social attention unfolds over time and in different social contexts is essential for identifying early markers of ASD that align with individual developmental patterns.

Objectives:

This study aims to explore: (a) how diagnosis (i.e., group; ASD, neurotypical [NT], and ATP [not ASD nor NT]) and age influence social attention outcomes, as measured by %Head (looking at the head) and %Activity (looking at the activity); and (b) how the gaze direction of adults engaged in an activity (towards the activity or in mutual gaze) affects these outcomes and whether this varies by groups and age.

Methods:

A total of 218 infants/toddlers (ASD: $n = 40$; NT: $n = 137$; ATP: $n = 41$) were seen across four timepoints (7.45, 13.81, 28.41, and 39.23 months). At each visit, children watched 20-second-long videos of two women engaged in child-appropriate activities while their eyes were being tracked. A generalized linear mixed model with a beta-distributed outcome and post-hoc pairwise comparisons were conducted to address the aims.

Results:

The analysis showed that the effect of age on %Head was non-linear and significant ($p < .001$). Group differences were particularly pronounced under certain gaze conditions and at specific ages. In the 'towards the activity' condition, the ASD group showed lower odds of %Head compared to the ATP ($p = .014$) and NT groups ($p = .023$) at the earliest timepoint (7.45 months). In the 'mutual gaze' condition, the ASD group also had lower odds of %Head than both groups at later timepoints (at 28.41 months [$p = .004$, $.040$, respectively] and at 39.23 months [$p = .007$, $.0009$, respectively]). Similarly, the effect of age on %Activity was non-linear and significant ($p < .001$), with group differences emerging over time ($p = .037$). The interaction between group and age was significant ($p = .024$), indicating that %Activity changes with age differed across groups. Notably, by 39.23 months of age, the ASD group had lower odds of %Activity in the 'towards the activity' condition compared to the NT group ($p = .035$).

Conclusions:

Findings highlight the variability in social attention development among young children with and without ASD, supporting the notion that ASD encompasses diverse developmental pathways. Infants and toddlers with ASD may follow distinct trajectories in attending to social stimuli, with patterns varying by age and context. Social attention difficulties in ASD appear early and persist, though their nature evolves over time. While these results point to potential early markers of ASD, the developmental patterns remain non-uniform, emphasizing the complexity and heterogeneity of social attention challenges in ASD.



428.120 Oculomotor Characteristics across the Paediatric Autism-ADHD Spectra

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Background: Oculomotor characteristics, such as accuracy, timing, and sensorimotor processing, are sensitive intermediate phenotypes for neurodevelopmental conditions, such as autism and ADHD. Oculomotor characteristics have been studied separately in autism and ADHD, however few studies have investigated oculomotor processes among those with co-occurring autism+ADHD, despite the high prevalence of clinical overlap between these conditions.

Objectives: This study aimed to identify oculomotor characteristics across the autism-ADHD spectra, across visually guided saccade (VGS), anti-saccade (AS), sinusoidal pursuit and step-ramp pursuit tasks to thoroughly interrogate bottom-up and top-down processing systems.

Methods: Four hundred and five (405; 226 males) Australian children aged 4.04 years to 18.75 years with ADHD ($n = 64$), autism ($n = 66$), ADHD+autism ($n = 146$), or who were neurotypical ($n = 129$) were compared on oculomotor variables from four different oculomotor tasks as part of the Monash Autism and ADHD Genetics and Neurodevelopment (MAGNET) Project: visually guided saccade, anti-saccade, sinusoidal pursuit and step-ramp pursuit tasks. Post-hoc exploratory confirmatory analyses were conducted using separate datasets acquired from Nottingham University ($n = 17$ autism, $n = 22$ ADHD, $n = 32$ autism+ADHD, $n = 30$ neurotypical) and University of Kansas ($n = 29$ autism, $n = 41$ neurotypical).

Results: Linear mixed effect models controlling for sex, age and family revealed children with autism+ADHD exhibited increased variability in saccadic final eye position accuracy compared to neurotypical children from the MAGNET cohort. Meanwhile, autistic children demonstrated a greater number of catch up saccades during sinusoidal pursuit compared to neurotypical children. No significant anti-saccade effects were observed. Overall, findings were not confirmed in post-hoc analyses of Nottingham and Kansas cohorts.

Conclusions: Findings suggest that the accuracy of visually guided saccades and pursuit eye movements, both probing bottom-up processing networks, are emerging biomarkers of autism+ADHD and autism, respectively.

428.121 Performance in Cold and Hot Executive Functions in High-Functioning Autistic Children and Adolescents from the Dominican Republic and Cuba

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Background: For decades, research on executive functions in autistic people has focused on behavioral aspects related to cold executive functions. However, since the beginning of the century, the distinction between a cold-cognitive system and a hot-emotional one has allowed us to analyze how both cognitive and emotional experiences occur and thus respond to the relationship between mental life and the adaptive functioning of people. Despite its relevance, research on hot executive functions in autistic individuals remains limited, particularly during late childhood and adolescence. Understanding the relationship between cold and hot executive functions in children aged 8 to 18 years is essential for comprehending cognitive processes that are critical to social relationships, educational development, and preparation for adulthood.

Objectives: To explore whether an association exists between the performance of cold executive functions—such as cognitive flexibility, inhibition, and working memory—and hot executive functions, specifically theory of mind and decision-making under risk, in high-functioning autistic children and adolescents aged 8 to 18 years.

Methods: A cross-sectional study was conducted between September 2016 and March 2019 in the Dominican Republic and Cuba. A convenience sample included 30 male children and adolescents with a mean age of 12.45 years (15 diagnosed with high-functioning autism spectrum disorder [ASD] and 15 with typical development). Inclusion criteria were: a) age between 8 and 18 years, b) a prior ASD diagnosis, and c) an intellectual quotient of 80 or above measured through the Wechsler Intelligence Scale for Children. Exclusion criteria included the presence of comorbid clinical conditions, ongoing pharmacological treatment, significant deficits or absence of oral language production, and lack of formal education. Identical criteria, except for the ASD diagnosis, were applied to select participants with typical development. Ethical approval was granted by the CONABIOS (Consejo Nacional de Bioética en Salud), Dominican Republic.

Cold executive functions were assessed using measures of flexibility, inhibition, and working memory, while hot executive functions were evaluated through theory of mind and decision-making under risk tasks.

Results: The performance of children and adolescents with ASD on cognitive flexibility and working memory tasks was independent of their performance on hot executive function tasks. However, a statistically significant relationship emerged between inhibition, measured by the Stroop test, and decision-making under risk, evaluated using the Cake Gambling Task (CGT). Specifically, significant positive correlations were observed between inhibition and performance on the Adequate Strategy ($r = .65$, $p = .009$) and the Risk Index or Global CGT ($r = .64$, $p = .010$), indicating that participants who performed better on the Stroop test also employed more effective strategies and demonstrated better-calibrated risk-taking behavior.

Conclusions: The results suggest that cognitive flexibility and working memory are independent of hot executive function performance in high-functioning autistic children and adolescents. However, in this sample, the ability to inhibit prepotent responses was significantly associated with the use of appropriate strategies in risk-related decision-making scenarios. These findings indicate that inhibition is not linked to theory of mind but is instead connected to emotional processes involved in making decisions under risk.

428.122 Phenotypes of Social Attention across Infant Risk Groups for Autism Spectrum Disorder

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Background: Autism Spectrum Disorder (ASD) may develop around a complex interplay between environmental and genetic risk factors, reflecting a highly individualized process. Eye tracking provides a means of quantifying attention as an early marker for ASD. It has been shown that at 6 months, neurotypical (NT) infants pay selective attention to mouths during speech (potentially scaffolding early language acquisition), and shift attention towards eyes near 1 year of age as language proficiency matures. ASD children gaze less at people's mouths during videos featuring directed speech than neurotypical children at 6 months, suggesting potential early differences in audiovisual synchrony (AVS) sensitivity.

However, little is known about how birth events, such as low birthweight or gestational age, may relate to early AVS attention profiles.

Objectives: To determine whether or not atypical birth events as well as familial history of ASD, both associated with higher rates of ASD, would both be associated with diminished AVS sensitivity in infancy.

Methods: In a longitudinal study of early development (6 to 42 months), valid eye-tracking data was acquired from 3 recruitment groups of infants (low birth weight (LBW, n=72); siblings of children with ASD (SIB, n=30); or low likelihood for atypical development (LL, n=120)). The LBW group was further divided into heavier (LBW-H, n=37, weight at birth 1.7-2.4kg) and lighter (LBW-L, n=35, 0.5-1.7kg). This abstract is an exploratory examination of differences in attention to areas of AVS from matched social (speaking faces) and non-social (houses with windows flashing in synchrony to synthesized sine-wave speech) stimuli at the first timepoint (average age 7.5m, gestational age corrected), as calculated from spline-based beta modeling of group-based developmental trajectories. An exploratory analysis considered group-differences in children with ASD outcomes.

Results: The LBW-H group exhibited greater attention to social AVS (speaker mouths) than all other groups (vs. SIB $p=.002$, LBW-L $p<.001$, LL $p=.004$). The only other recruitment-group difference was that the LBW-L group looked less at mouths than LL ($p=.007$). No differences were evident in the non-social AVS (flashing windows) condition, excepting a suggestive lower AVS sensitivity in LBW-L versus SIB ($p=.093$). In the subset of children with ASD outcomes, LBW-H infants showed higher AVS social looking than SIBs ($p=.02$). When grouped by later outcomes (e.g. ASD), there were no significant differences evident in social or non-social AVS looking at 7.5m.

Conclusions: Contrary to expectations, the LBW-H group showed elevated rates of social AVS looking compared to other groups. Because LBW children had lower gestational ages than non-LBW children, it is possible that gestational age correction incompletely accounted for longer visual experience shaping AVS sensitivity. However, very light (and also even younger) LBW-L children showed evidence of broad diminished AVS sensitivity, suggesting potential dose-dependency in the severity of perinatal birth events and AVS responsivity. Sustained differences between LBW-H and SIBs with ASD outcomes suggest that that different biological pathways towards ASD (exhibited by our distinct risk groups), including non-genetic pathways, may confer varying levels of penetrance and expressivity of elementary social information processing mechanisms at 7.5 months.

428.123 Predictive Coding and Autism Spectrum Disorder: Unraveling the Interplay of Systemizing and Empathizing Mechanisms

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Background: This study explores the intricate relationship between autism spectrum disorder (ASD) and the predictive coding framework, aiming to illuminate the underlying mechanisms contributing to the diverse symptomatology observed in individuals with ASD. Rooted in Systemizing and Empathizing mechanisms, the research investigated how the interplay of high Systemizing quotient (SQ) and low Empathizing quotient (EQ) contributes to the manifestation of ASD symptoms. The investigations focus on how these two mechanisms affect the ability to use different cues (social and non-social) in making decisions.

Objectives: To verify whether the ASD process and response to errors (or violations of their predictions) is a primary dysfunction that, when viewed in the context of the functioning of the Systemizing and Empathizing mechanism, provides a meaningful explanation for different symptoms of ASD. This research scrutinised how individuals with varying Systemizing and Empathizing traits differ in learning cue contingencies in probabilistic reward tasks.

Methods: The study was conducted on 33 students of IIT Kanpur (Male = 20, Female = 13) with a mean age of 21 ($\sigma = 2.54$). The sample size was calculated using G POWER software (Faul, Erdfelder, Lang, & Buchner, 2007; Happe & Booth, 2008). The power of 0.8 with the effect size ($d = 0.4$) from the previous study was used to calculate the sample size with $\alpha = 0.05$.

We conducted Linear mixed-effects analysis for transition probability of staying even after a loss as a function of SQ and EQ, cue type (context) and Volatility as fixed effects and participant as a random effect. The model that best fitted the data was the full interaction model between the three fixed effects ($p \text{ lose stay} \sim \text{SQ} * \text{EQ} * \text{condition} * \text{volatility} + (1|\text{PID})$, data=df, REML=FALSE).

Results: We have taken EQ, volatility and condition as the main effects and participants as random effects in our model. The models were compared, and we obtained a chi-square value of 40.335 ($p < 0.001$) with AIC = -7711.9 and BIC = -7591.1. The model shows the interaction effect of SQ, EQ, condition and volatility.

Conclusions: LME analysis findings indicate that individuals with high SQ and low EQ exhibit efficient non-social cue utilisation when the cue-target relationship is stable but struggle to disengage from them during the volatile phase, aligning with documented intolerance to change in ASD. The study delves into cue contingency learning patterns, revealing that individuals with high EQ and SQ prefer to stay with social cues in non-volatile conditions. Conversely, those with low EQ and high SQ favour non-social cues, especially in volatile situations. The study also suggests that different prediction tasks engage the Systemizing and Empathizing mechanisms differentially, offering a more nuanced perspective on the cognitive processes involved in prediction and its link with the two mechanisms.



428.124 Preserved but Un-Sustained Responses to Bids for Dyadic Engagement in School-Age Children with Autism

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Background:

Social attention, including attention to conversational speaker and flow, is essential for positive social interactions. Dynamic eye-tracking paradigms are an engaging way to capture social attention in autism, yet there is a need to build upon years of autism research to develop novel paradigms that capture developmentally appropriate, socially rich aspects of social attention, especially given ongoing updates to the prevalence, demographic characteristics, and phenotypic heterogeneity of autistic individuals.

Objectives:

This study introduces a novel eye-tracking task designed to assess social attention during complex conversational interactions among school-aged children. We focused on three primary outcomes: overall face-looking, responses to dyadic bids, and post-dyadic bid attention modulation.

Methods:

A sample of 161 school-aged children (78 autistic, 83 neurotypical) was administered a novel eye-tracking task that consisted of six video clips depicting three adult actors seated at a table engaging in conversation with one another. Periodically, one of the actors would look directly into the camera and break the fourth wall to speak to the viewer. Following the dyadic bid, the bidder would look back to another actor and their conversation would resume. The primary variable of interest was the percentage of time looking at the actors' faces.

Results:

Autistic children displayed significantly lower overall attention to faces compared to their neurotypical peers ($p < .0001$). Contrary to expectations, both groups demonstrated preserved responses to dyadic bids, with no significant differences in attention towards the bid speaker. However, a significant divergence was observed following the dyadic bid: neurotypical children showed more attention to other conversational agents' faces than autistic children ($p = 0.017$).

Conclusions:

These findings highlight key differences and similarities in how autistic and neurotypical children engage with social cues, particularly in dynamic and interactive contexts. The preserved response to dyadic bids in autism, alongside the absence of post-bid attentional shifts, suggests nuanced and context-dependent social attention mechanisms that should be considered in future research and intervention strategies. This study challenges our previous assumptions about the role of eye tracking in autism research. First, eye-tracking paradigms can leverage both temporal- and region-based regions of interest to more accurately reflect the complex and often nuanced dynamics at play during sophisticated social interactions. This is particularly relevant as eye-tracking continues to be deployed across the lifespan as either an index of autism or a marker of treatment response. Second, whereas much existing eye-tracking work highlights autistic differences in social attention, these findings show how eye-tracking can elucidate nuanced patterns of social attention across groups. We demonstrate that, in school-age children, autistic children are equally sensitive to the social salience of the dyadic bid. Our findings suggest that, while autistic children may need additional support to develop skills necessary to navigate the complex social world, they do engage in socially appropriate shifts in attention in the context of naturalistic depictions of social interactions.

428.125 Quantifying Divergent Visual Engagement Trajectories in Autism: A Bayesian Network Approach to Social Learning Pathways

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Background:

Eye-tracking-based measurement of social visual engagement—how children engage with and look at the social environment—has been identified as a key endophenotype in autism spectrum disorder (ASD). Social visual engagement and learning are tightly linked: directing attention to certain stimuli while excluding others provides opportunities for learning that influence future allocation of attention. While studies show that autistic children attend to social information differently than children without autism, studies have not yet examined how these different learning experiences shape future action, leading to increasingly divergent pathways of learning.

Objectives:

We aimed to develop a novel approach for quantifying how a toddler's current looking behaviors (what they look at now) depend on past experiences (what they looked at previously) by calculating the conditional dependencies between different viewing targets. High conditional dependence between two visual targets indicates that a toddler's past viewing experience resulted in learning that modified their current looking behaviors. By contrast, low conditional dependence between visual targets suggests that a toddler's past viewing experience did not lead to learning that impacted where they looked next.

Methods:

Eye-tracking data were collected from typically developing toddlers ($n=75$) and toddlers with ASD ($n=81$) while watching videos featuring toddlers interacting. Eye, mouth, body, object and background regions of interest (ROIs) were coded. Visual targets at each frame were defined in three ways: by ROIs, hotspots (i.e. areas fixated by most viewers), and fixation coordinates. These three datatypes were used to fit Bayesian networks for each group to assess the structural similarity in visual engagement trajectories (i.e. conditional dependence between visual targets) across different datatypes and by group. For each datatype, frames were selected where the population-wise median salience value (quantifying the density of fixations per frame) was $\geq 75^{\text{th}}$ percentile of median salience and downsampled to ensure the number of variables was <100 . Hotspots were created by thresholding ROIs with a salience value $\geq 95^{\text{th}}$ percentile, returning a Boolean variable asserting whether a participant fixated in that hotspot or not. For each datatype, Bayesian network structures were learned using the hill climb algorithm with the Bayesian information criterion as the scoring method.

Results:

ASD viewers spent a higher proportion of viewing time on background and body ROIs (kstest2: $p_{\text{background}} = 0.004$, $p_3 < 0.001$, $p_7 = 0.03$, $p_{10} = 0.013$), fixating on the bodies of the two toddlers in the video, Riley and Sam (R and S, respectively), while TD participants spent a higher relative proportion fixating on the eyes of R and S ($p_1 < 0.001$, $p_5 < 0.001$, respectively).

Networks constructed for TD and ASD groups using the three datatypes were significantly correlated within and between groups, showing higher intra-group correlation (Fig 1G), offering convergent evidence of the network fit and highlighting different viewing pathways between groups.

Conclusions:

Our findings, demonstrating high convergence between three different approaches for Bayesian modeling of visual learning pathways, provide proof-of-concept for quantifying structural similarity in visual engagement trajectories, paving the way for the development of eye-tracking-based measures of real-time social learning in autism.



428.127 Robust Retrieval Practice and Post-Retrieval Feedback Effects Extend to Include Autistic Learners

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Background: Retrieval practice—testing oneself on recently learned information—enhances learning across a wide range of topics and modalities, and is generally most effective when the learner is provided feedback about their performance. Despite robust evidence that retrieval practice is an effective strategy across many clinical populations who cope with memory difficulties, it has not been studied in autism. Autism can affect learning in different and often nuanced ways, and autistic learners are at higher risk of learning disorders and intellectual disability. It is therefore crucial to identify effective learning strategies for autistic individuals, and retrieval practice is a promising approach worth examining.

Objectives: We measured the effects of retrieval practice and post-retrieval feedback on associative learning among autistic learners, who are at higher risk of learning disorders and intellectual disability but were previously overlooked in the testing effect literature.

Methods: Across two experiments, autistic (Aut) and non-autistic (NonAut) learners completed a word pair associative learning task. In Experiment 1, 40 Aut (17 women, 11 men, 10 non-binary, 2 unreported; age 18–35, $M = 27.3$, $SD = 5.22$) and 40 NonAut (22 women, 18 men; age 19–35, $M = 26.9$, $SD = 4.60$) participants listened to audio clips of unrelated cue-target pairs during an initial study block (e.g., *typing flower*). A cued recall test followed, in which feedback was provided for half of the trials, and the experiment concluded with a final cued recall test. In Experiment 2, retrieval practice took the form of a four-alternative forced choice recognition test, and study and test trials were all presented in written text; experimental procedures were otherwise similar to Experiment 1. Experiment 2 was complete by 80 Aut (33 women, 38 men, 7, non-binary, 2 unreported; age 18–35, $M = 22.2$, $SD = 4.60$) and 80 NonAut (44 women, 34 men, 2 non-binary; age 19–35, $M = 26.8$, $SD = 4.58$) adults.

Results: In Experiment 1, final cued recall performance revealed that participants in both groups demonstrated better memory when feedback was provided after the initial retrieval attempt. For all participants in Experiment 2, recall for retrieval practice trials, with and without feedback, was higher compared to restudy trials, and this difference was statistically significant only between the retrieval practice with feedback condition relative to the restudy condition. These results (1) provide assurance that improved recall performance observed in Experiment 1 was due to post-retrieval feedback and not over-exposure to feedback trials and (2) demonstrate that retrieval practice and post-retrieval feedback facilitated learning relative to restudying material for autistic and non-autistic learners alike.

Conclusions: This study is the first to our knowledge to measure retrieval practice and post retrieval feedback effects in an autistic cohort. Our results suggest that the well-documented effects of retrieval practice, in concert with feedback following retrieval attempts, extend to support learning among individuals with autism. Future studies should examine the effects of retrieval practice and post-retrieval feedback among autistic learners to identify in which contexts these strategies are most effective.

428.128 Short-Term Relational Memory in Visuospatial and Multimodal Integration Tasks in Autistic and Non-Autistic Children
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Background:

Autistic people without intellectual disabilities display memory characteristics including difficulties with episodic memory (Desaunay et al., 2020), temporal order (Poirier et al., 2016) and item-context associations (Bowler et al., in press). All these characteristics have in common a difficulty with *relational binding* (Ring et al., 2017) thought to be mediated by fronto-hippocampal processes (Gaigg et al., 2015). Most of the work in this area has focussed on long-term memory (LTM) processes, with relatively few studies of short-term memory (STM) binding. Among such studies, Ring et al (2020) found diminished visuospatial and multimodal spans in autistic adults using a task developed by Quinette et al. (2006, illustrated below).

Objectives:

To extend Ring et al's finding of diminished visuospatial and multimodal span in autistic adults to autistic and non-autistic children.

Methods:

31 (29m, 2f) autistic children ADI/ADOS diagnosed to ICD-10 criteria and 31 (30m, 1f) non-autistic children matched on developmental level took a *Visuospatial Span Task* requiring recall of serial order of spatial locations of crosses on a computer screen, and a multimodal *Integration Task* (Quinette et al, 2006, illustrated) testing binding of letters and screen locations via colour. We also collected parent ratings using the BRIEF. Example of two test trials of the version of Quinette et al's (2006) Integration Task used here. Participants had to memorize the letter in the location with the cross of that same colour and form letter-location associations. After a 1s interval a lowercase black letter was presented and participants had to indicate by keypress if the location of the letter corresponded to the letter-location association they previously formed (bottom) or not (top).

Results:

Because age correlated with Visuospatial span ($r_{ASD} = 0.462, p < .001$; $r_{TD} = 0.313, p < .001$) and Multimodal span ($r_{ASD} = 0.431, p < .001$; $r_{TD} = 0.582, p < .001$) in both groups, it was included as a covariate in group comparisons. Autistic children had significantly lower Visuospatial Span and Multimodal span than the non-autistic children (Visuospatial Span ($M_{ASD} = 0.13, SD_{ASD} = 0.17$; $M_{TD} = 0.22, SD_{TD} = 0.12, F(1,59) = 12.09, p < .001, h^2_p = 0.17$); Multimodal Span ($M_{ASD} = 0.29, SD_{ASD} = 0.18$; $M_{TD} = 0.35, SD_{TD} = 0.18, F(1,59) = 6.56, p < .02, h^2_p = 0.11$)), but although the BRIEF scores were significantly lower in the autistic children ($M_{ASD} = 71.60, SD_{ASD} = 10.12$; $M_{TD} = 46.10, SD_{TD} = 10.69$), $t(57) = 9.41, p < .001$, Cohen's $d = 2.45$, 95% CI [1.77, 3.13], these did not correlate with performance on either of the span tasks for either group (Max. $r = -.23$; Min $p = .23$).

Conclusions:

Our results replicate those of Ring et al (2020) with autistic adults and suggest that the processes measured here are present from childhood. The failure to find correlations with the executive function measure on either task in contrasts with Ring et al's (2020) finding of significant correlations for their autistic adults using the Color Trails task, and may reflect differences between direct and parent-report measures of EF.



428.129 Similarities and Differences in Neurodiverse Youth with and without Autism Spectrum Disorder

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Background: Autism Spectrum Disorder (ASD) is thought to exist on a spectrum from mild to severe with autistic traits extending into the general population. While social cognitive impairments are a hallmark feature of ASD, they are also characteristic of many neurodevelopmental and psychiatric disorders. In addition, comorbid conditions, such as anxiety, aggression, attention problems, gender dysphoria, and sleep problems have higher rates in youth with ASD. However, it's unclear how youth with social cognitive deficits without ASD compare to youth with social cognitive deficits with ASD across behavioral and cognitive domains.

Objectives: Our objective is to compare behavioral and cognitive profiles in youth with social cognitive deficits, but with and without ASD. We also aim to compare this group to typically developing youth.

Methods: The Adolescent Brain Cognitive Development (ABCD) Study is a longitudinal population-based study of 11,868 children across the US. We included data from baseline assessment (9-10 years-of-age) through the 4th year follow-up (13-14 years-of-age). We split participants into one of four groups. Group 1 had high SRS scores, and no ASD diagnosis ($n = 835$). Group 2 had high SRS scores and an ASD diagnosis ($n = 166$). Group 3 had low SRS scores, and an ASD diagnosis ($n = 56$). Group 4 was our control group, having low SRS scores and no ASD diagnosis ($n = 10,106$). We measured autistic traits using the Short Social Responsiveness Scale (S-SRS). Autism diagnoses were obtained via either parent report or the Kiddie Schedule for Affective Disorders and Schizophrenia (K-SADS). Behavioral problems were measured using the internalizing and externalizing problem scores on the Child Behavior Checklist (CBCL). Additional comorbidities such as Attention Deficit Hyperactivity Disorder (ADHD), Obsessive Compulsive Disorder (OCD), Generalized Anxiety Disorder (GAD) and Major Depressive Disorder (MDD) were measured using the K-SADS. Cognitive performance was measured using the NIH Toolbox. Finally, we measured prosocial behavior using the prosocial behavior subscale of the Strengths and Difficulties Questionnaire (SDQ). We also analyzed Gender Dysphoria by using the youth gender survey. For analyses, we used linear mixed effects models to compare the four groups on internalizing, externalizing, symptom scores, controlling for age, sex, race/ethnicity, and parental education level. We also assessed differences in comorbid and cognitive performance between the four groups.

Results: Group 1 had higher internalizing and externalizing problems than Groups 2, 3, and 4 ($\beta_s = -4.00, -9.90$, and -12.00 for internalizing $-2.12, -13.65$, and -12.17 for externalizing, respectively, all $p < 0.05$). Group 1 had a larger reduction in symptoms over time than Groups 3 and 4 ($\beta_s = 0.48$ and 0.44 for internalizing and 0.90 and 0.51 for externalizing, respectively, all $p < 0.05$), but no difference from Group 2.

Conclusions: Participants high on autistic traits/social impairments without ASD may differ from both the neurotypical and the ASD population and may have different developmental trajectories.

428.130 Social Attention and Social Knowledge in Autistic and Non-Autistic Children

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Background: and Objectives:

The study of attention among youth with autism spectrum disorder (ASD) has shifted towards a focus on the styles and strengths of attention, and away from the traditional deficit-focused view of attention (Burack et al., 2016). In this study, we address the particular suggestion that diminished attention both to static faces and to socially relevant stimuli may indicate differences in attention to socially-laden stimuli (Klin et al., 2010; Guillon et al., 2014; McPartland et al., 2010). Thus, we explore the relationship between attention to socially relevant stimuli on a dynamic, three-dimensional attention task and social knowledge among autistic and non-autistic youth.

Methods:

To measure the attention styles and biases, 31 autistic (*Age* = 11.8 years) and 49 non-autistic (*Age* = 10.7 years) participants were presented with a three-dimensional version of the biological motion task (BM; Johansson, 1973). In this task, the participants examined a moving image of a walking human figure to determine the walking direction. The task becomes harder when distractor dots are added to the surround. Furthermore, to measure social competence, the participants' caregivers completed the Multidimensional Social Competence Scale (MSCS; Yager & Iarocci, 2013). We examined the MSCS items pertaining to social knowledge (e.g., participant understands what constitutes a friend, and has reasonable expectations of friends).

Results:

One-way ANOVA results indicated that the non-autistic participants received higher caregiver ratings on social knowledge, $F(1, 93) = 42.1, p < .001$, but no group differences were found for biological motion, $F(1, 78) = 1.83, p = .180$. The results of a moderation analysis suggested that the scores on the biological motion test were predicted by scores on social knowledge ($B = 5.98, p = .029$), but that the interaction effect of group on social knowledge and biological motion was not significant ($B = -3.78, p = .318$). A significant correlation between BM scores and social knowledge ($r = .340, p = .017$) was found in the non-autistic group, but not in the autistic group ($r = .248, p = .233$).

Conclusions:

As depicted in our results, we found that, for both groups, social knowledge predicts performance on a social attention task. Additionally, we found that the autistic and non-autistic groups differed in caregiver-reported social knowledge, but not in their performance on a social attention task. We did not find group differences regarding the relationship between social knowledge and performance on a social-attention task. Differences in attention to social stimuli between autistic and non-autistic individuals have been reported in previous research (Klin et al., 2002). We suggest that, though these attentional group differences are salient, autism may not affect the relationship between social knowledge and performance on a social attention task. In other words, while social knowledge and social attention task performance seem to be related, this relationship appears to be independent of autism. Differences in sample size may explain some of the group differences. Further research is required to determine the nature of the relationship between social knowledge and social attention in children with autism.

428.131 Subtyping Autism in Early Childhood Based on Autism Symptoms, Executive Functioning, Language, and Cognitive Skills
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Background: Autism Spectrum Disorder (ASD) is characterized by significant phenotypic heterogeneity, making it essential to identify meaningful subtypes to tailor interventions and gain insights into developmental and etiological pathways. Previous research has predominantly focused on symptom severity and has primarily included school-age children, adolescents, and adults (Cholemkery et al., 2016; Kloppe et al., 2017). Although some studies have explored subgroups reflecting functional domains, few have incorporated the characteristics of executive function (EF) and expressive language into subtyping. Since language delays, EF deficits, and cognitive variability are common and significant predictors of developmental outcomes in ASD (Demetriou et al., 2018; Howlin, 2003), incorporating these domains into subtyping is crucial.

Objectives: This study aims to (1) identify distinct clusters within young autistic kindergarteners based on core autism symptoms, lab-based EF, real-world EF (parent-reported), expressive language, and NVIQ, and (2) compare these clusters on demographic and clinical characteristics, including age, gender, adaptive functioning, and behavioral problems.

Methods: The sample included 94 autistic children from South Korea (mean age=69.35 months, 72 males), who were cognitively-able (mean NVIQ=102.13, SD=15.29) and verbal (i.e., flexible phrases or complex sentence). Autism symptoms were assessed with the ADOS-2 calibrated severity scores (Hus et al., 2014). Expressive language was evaluated using the calibrated metric of the ADOS-2 Overall Level of Non-Echoed Spoken Language item (Mazurek et al., 2019). Lab-based EF (inhibitory control, working memory, and attention shifting) was assessed via EF Touch (Willoughby et al., 2010), a tablet-based task, while real-world EF was measured using parent-reported measure, the BRIEF-2. NVIQ was measured using K-WPPSI-IV, adaptive functioning via K-Vineland-II, and behavioral problems via K-CBCL. All scores were standardized. NbClust() on R was conducted to determine the optimal number of clusters, followed by k-means clustering. Group differences were examined using ANOVAs, Kruskal-Wallis tests, and χ^2 tests, with corrections for multiple comparisons.

Results: (1) Four distinct subgroups emerged, characterized by different profiles of autism symptoms, EF, language, and NVIQ: Cluster 1 "Impaired Generalized EF, High Language & IQ," Cluster 2 "Low Lab-based EF Skills, Low Language & IQ," Cluster 3 "High Overall EF, Low ASD Symptoms, High Language & IQ," and Cluster 4 "Moderate EF Impairments, Low IQ & High ASD Symptoms" (BSS/TSS = 48.6%). (2) Subgroup comparisons revealed significant differences in adaptive behavior and behavioral problems. Cluster 1 had significantly higher behavioral problems than the other three clusters ($F(3,90) = 11.97, p < 0.001, \eta^2 = 0.29$), while Cluster 3 had significantly higher adaptive behavior scores compared to Clusters 1 and 2 ($H(3) = 33.8, p < 0.001, \eta^2 = 0.33$). No differences among the clusters emerged for age and gender.

Conclusions: Identifying these subtypes enhances our understanding of the developmental trajectories of autistic children and provides a deeper insight into potential developmental pathways and the design of more effective, tailored interventions.



428.132 The Combined Impact of Autism Traits and Target-Distractor Similarity on Visual Search Guidance
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Background: Individuals with autism often demonstrate a detail-oriented perceptual style, which is linked to core symptoms of the disorder (Behrmann et al., 2006; Alink & Charest, 2020) and extends to autism traits in neurotypical populations (Chouinard et al., 2013). This detail-oriented processing is associated with enhanced visual search performance in autism (Gilga et al., 2015; O’Riordan et al., 2001). However, many studies on visual search in autism have used feature-conjunction tasks, (Kaldy et al., 2016), which involve structurally similar distractors that require more direct, detailed evaluation of items in the search display (Wolfe, 2021). Therefore, these studies may not capture the complexities of real-world search, where target-distractor similarity varies.

Objectives: To examine how autism traits interact with expected and current target-distractor-similarity to influence visual search performance.

Methods: Eighty participants ($M_{age}=19.58$, $SD_{age}=1.43$; 19 male) completed a visual search task, with eye tracking. Participants were assigned to one of two groups: the similar-distractor context group (SCG) primarily saw *similar-distractor trials* and the distinct-distractor context group (DCG) primarily saw *distinct-distractor trials* (Figure 1). Each group completed 150 test trials — 130 trials with their group-assigned target-distractor similarity (similar or distinct) and 20 trials with the opposite similarity. Autism traits were measured using the Autism Spectrum Quotient (AQ; Baron-Cohen et al., 2001). A linear mixed-effects model was used to analyze the relationship between AQ score, distractor-similarity context, and trial target-distractor similarity on attentional guidance (time to first target fixation).

Results: The analysis revealed a significant main effect of trial distractor-similarity ($b=404.061$, $p<0.001$). Participants took longer to fixate the target on *similar-distractor trials* than *distinct-distractor trials*. Although there was no significant main effect of AQ score, participants with higher AQ scores showed smaller increases in attentional guidance on *similar-distractor* versus *distinct-distractor trials* ($b=-8.317$, $p=0.014$), indicating reduced sensitivity to distractor similarity with higher autism traits. A significant three-way interaction ($b=13.701$, $p=0.007$; Figure 2) indicated differential effects of AQ score across groups. In the DCG, as AQ scores increased, the difference in guidance times between *distinct-distractor* and *similar-distractor trials* decreased, suggesting reduced sensitivity to target-distractor similarity. In the SCG, higher AQ scores led to greater increases in guidance time on *similar-distractor trials* compared to *distinct-distractor trials*, suggesting that higher AQ scores were associated with more careful assessment of detailed information in the search array when targets and distractors were highly similar.

Conclusions: These findings challenge the idea that autism traits are broadly related to a visual search advantage. While participants with higher AQ scores guided attention faster to targets on *similar-distractor trials*, likely due to their enhanced detail perception, this advantage was absent when distractors were distinct from the target. Critically, participants with higher AQ scores were only faster on *similar-distractor trials* when in a context where attention to detail was not emphasized, such as repeatedly searching for a target among distinct distractors. When they regularly encountered similar distractors, participants with higher AQ scores slowed their guidance to the target, possibly overemphasizing detailed processing at the expense of broadly evaluating the display to guide eye movements.



428.133 The Impact of Sex and Symptom Severity on Academic Outcomes in Autism

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Background:

Autism is often associated with differences in academics, but the current literature is dominated by autistic boys, lacking sufficient representation of girls. The known factors that differ in how autism presents in girls and boys may directly impact academic outcomes. For example, increased camouflaging in autistic girls, both in terms of the social elements of autism as well as of restricted and repetitive behaviors, may lead to different academic experiences and outcomes for autistic girls and boys. Given the relationship between academics and numerous life outcomes, understanding how sex and autistic features interact to impact academics is critical to supporting the needs of autistic children.

Objectives:

Our goal was to explore whether sex and autism symptom severity interact to predict various academic outcomes.

Methods:

We extracted data from the Child Mind Institute’s large scale data collection biobank, the Healthy Brain Network, including 652 autistic participants (120 females, age 5-21) that completed measures related to autism symptoms and academics. The Repetitive Behaviors Scale, Social Responsiveness Scale, and Social Communication Questionnaire were used to explore autism symptom severity. The Wechsler Individual Achievement Test and the Test of Word Reading Efficiency were used to evaluate academic outcomes (see Figure 1 for subscales). We conducted linear regressions with sex, symptom severity, and a sex*severity interaction to predict each academic outcome measure, with a focus on identifying interactions between sex and symptom severity.

Results:

Overall, greater autism symptom severity was significantly ($\alpha=0.05$) linked to worse academic outcomes. Importantly, regressions revealed multiple areas where the relationship between symptom severity and academic outcomes differed between girls and boys. Results revealed that sex and repetitive behaviors significantly interacted to predict multiple reading measures (Phonemic Decoding Efficiency, Total Word Reading Efficiency, Word Reading, and Pseudoword Decoding), with repetitive behaviors more negatively correlated with reading measures in girls than in boys. Also, sex and social responsiveness significantly interacted to predict reading measures with social responsiveness more negatively correlated with some reading measures in girls (Phonemic Decoding Efficiency, Sight Word Efficiency, and Total Word Reading Efficiency), but more negatively correlated in boys with Word Reading and Spelling. Finally, sex and social communication significantly interacted, with social communication in boys more negatively correlated with Math Problem Solving (see Figure 2).

Conclusions:

In autism, symptom severity predicted several academic outcomes differently in girls than in boys. It seems girls are more negatively impacted in reading by more severe repetitive behavior symptoms. Furthermore, girls seem to be more negatively impacted by more severe social responsiveness symptoms in measures of reading efficiency. It is possible that reading is the academic domain most affected by symptom severity in autistic girls. Regarding autistic boys it seems there is greater breadth in the academic domains that are impacted by more severe symptoms, with select reading skills negatively impacted by social responsiveness symptoms and math skills by social communication symptoms. Understanding what factors differentially contribute to academic success in autistic girls and boys permits focusing on the bases of academic challenges.



428.134 The Influence of Eye Refraction on Gaze Patterns in Facial Affective Recognition Among Children with Autism Spectrum Disorder

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Background:

Previous research has shown that children diagnosed with Autism Spectrum Disorder (ASD) often have deficits in recognizing facial expressions and tend to avoid eye contact, which significantly affects their ability to perceive and interpret social cues. Eye refraction is a key factor in assessing ocular function and may influence gaze behavior during social interactions. However, empirical evidence is needed to examine the impact of eye refraction on facial expression recognition in children with ASD.

Objectives:

This study aimed to explore differences in gaze patterns between children with ASD and typically developing (TD) children, considering their refractive states, during the recognition of seven distinct human facial expressions.

Methods:

Children with ASD and typical refractive status ($N=40$, $M_{age} = 5.15$, $SD = 1.03$, 87.5% male) and those with atypical refractive status ($N=34$, $M_{age} = 5.39$, $SD = 1.24$, 76.47% male), as well as age-matched TD children with typical refractive status ($N=40$, $M_{age} = 4.62$, $SD = 0.87$, 52.5% male) and those with atypical status ($N=34$, $M_{age} = 4.42$, $SD = 1.09$, 57.58% male), were recruited from Tianjin, China. The participants underwent eye-tracking experiments involving images depicting seven facial expressions: anger, disgust, fear, sadness, surprise, happiness, and calmness. Additionally, their refractive status was assessed. Total fixation duration (TFD) and fixation count (FC) on specific areas of interest (AOIs), such as the face, eyes, and mouth, were analyzed and compared across the groups.

Results:

The results indicated a significant decrease in both FC and TFD for children with ASD compared to TD children, particularly in the face and eye regions, when viewing the seven facial expressions (Interaction effect of TFD: $F(2, 18) = 17.423$, $p < 0.001$; Interaction effect of FC: $F(1.92, 276.126) = 12.490$, $p < 0.001$). Additionally, both ASD and TD children with typical refractive status demonstrated more frequent fixations on the eye region compared to those with atypical refractive status ($p < 0.01$), especially for expressions of disgust and happiness (disgust pictures: $F(1, 144) = 5.034$, $p < 0.05$; happiness pictures: $F(1, 144) = 2.528$, $p < 0.05$). Children with ASD and typical refractive status exhibited significantly longer TFD in the face region when viewing pictures of happiness than those with atypical refractive status ($p < 0.05$), while no significant difference in TFD was observed between the two TD groups ($p = 0.325$).

Conclusions:

This study demonstrated that the refractive status of children with ASD may contribute to their reduced ability to perceive and interpret social cues, particularly in relation to eye contact and facial expressions, compared to TD children. Improving eye refraction in children with ASD may enhance their performance in facial expression recognition and social interactions.

**428.135** Unpacking Engagement in the Neurodiversity Movement: A Latent Class Analysis of Involvement, Strengths-Based Perceptions, and Self-Advocacy

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Background:

Little research has focused on collective advocacy of neurodivergent people through the neurodiversity movement (NDM). The NDM not only promotes strengths-based approaches to neurodivergence but embodies a broader expression of self-determination for neurodivergent people's common future. Despite academic interest in neuro-affirming principles and associations between NDM support and other factors (like stigma) toward autistic people (Kim & Gillespie-Lynch, 2023; Gillespie-Lynch et al., 2017), little is known about what NDM involvement actually means to people, including non-autistic neurodivergent people and neurotypical people.

Objectives:

- 1) To examine underlying latent classes of involvement in the NDM and the role of neurodivergent people in shaping collective, strengths-based advocacy
- 2) To analyze how perceptions of neurodiversity and the NDM influence movement participation

Methods:

Autism community members completed a survey about perceptions of and involvement with the NDM. Content analysis classified 491 open-ended responses to "Can

you say more about your involvement with the neurodiversity movement?". Latent class analysis (LCA), which helps identify hidden groups, revealed underlying NDM involvement profiles. Separately in autistic ($n_{aut}=275$) and nonautistic participants, we examined whether class membership was predicted by relationships to autism (i.e., autism researchers, caregivers), non-autism conditions (i.e., anxiety, depression, ADHD), self-rated NDM support/identification, and previously-coded open-responses to views on neurodiversity/the NDM.

Results:

LCA fit indices endorsed a four-class solution with the following classes (see Figure 1): Personal Supporters (9%), Public Supporters (45%), Passive Involvement (20%), and Uninvolved (26%). Covariate analyses showed that both autistic ($OR_{aut}=8.468, p=.033$) and non-autistic ($OR_{nonaut}=4.466, p=.043$) ADHDees were more likely to be Personal Supporters than Passively Involved; non-autistic ADHDees were more likely to be Public Supporters than Passively Involved ($OR_{nonaut}=4.002, p=.006$). In contrast, non-autistic depressed people were more likely to be Passively Involved than Public Supporters ($OR_{nonaut}=3.032, p=.031$). Higher NDM support/identification was associated with lower odds of being Uninvolved compared to Public Supporters ($OR_{aut}=0.355, p=.006$; $OR_{nonaut}=0.782, p<.001$).

Further analysis showed insights into how perceptions of the NDM shaped involvement. Autistic people who defined neurodiversity as including everyone were less likely to be Uninvolved than Public Supporters ($OR_{aut}=0.816, p<.001$). Non-autistic people who viewed the NDM as "trying to change society" were less likely to be Uninvolved than Public Supporters ($OR_{nonaut}=0.139, p<.001$), Personal Supporters ($OR_{nonaut}=0.193, p=.023$), and Passive Involvement ($OR_{nonaut}=0.252, p=0.17$).

Conclusions:

This study highlighted the varied ways that people engage with the NDM. A large portion of the sample reported public, visible support. Results showed that autistic

people and ADHDees play a key role in asserting self-agency through their Personal and Public Support. Understanding motivations and barriers to involvement, such as mental health conditions, is a critical step to ensuring more inclusive engagement. Findings indicated perceptions of the NDM as including everyone and focused on changing society led to higher support profiles. Future advocacy should use these insights to create tailored, strengths-based initiatives that encourage broader NDM participation.



428.136 Unraveling the Dimensionality of Social Attention through Psychometric Optimization of an Eye-Tracking Battery: Results from the Autism Biomarkers Consortium for Clinical Trials (ABC-CT)

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Background:

Social attention is a core domain of research in autism, with eye-tracking serving as a primary research method to quantify time spent looking at social information. However, there is no consensus operationalization of “social information,” and different studies use stimuli with highly variable visual properties to address this question. While these studies are informative for a given participant sample and set of stimuli, it remains unclear how to translate experimental results into generalizable and practical measures. Item response theory (IRT) is a psychometric framework that guides the development of effective measurement tools by precisely measuring how specifically a given item on a test measures a quantitative trait, such as social attention, and how well any set of items discriminates between different levels of a trait. Here we conceptualize individual eye-tracking stimuli as test items to, for the first time, employ IRT to eye-tracking data in autism research.

Objectives:

We employ IRT to: (1) Determine if social attention is a unidimensional construct amenable to measurement; (2) Identify an optimal set of stimuli for effectively measuring social attention while removing redundant or poorly performing stimuli (3) Determine what aspects of stimuli optimally measure different strata of social attention.

Methods:

Data were collected as part of the Autism Biomarkers Consortium for Clinical Trials (ABC-CT); a multisite, naturalistic study of 280 autistic and 118 neurotypical 6-11 year-old children. Eye-tracking data were collected from 70 distinct eye-tracking stimuli varying in static/dynamic nature, duration, image composition, and sound. Social attention was quantified, at the level of stimuli, as the propensity for a participant to look to social information (faces, eyes) greater than chance. IRT analyses of stimuli employed a 2-parameter logistic model.

Results:

Social attention, measured by this heterogeneous battery, is unidimensional, i.e., variation in social looking can be conceptualized as a measurable latent trait. Distinct stimulus properties more effectively measure variability at different levels of social attention. For people with reduced social attention, dynamic videos with speech are more effective. Conversely, for people with high levels of social attention, these stimuli are less effective measures for measuring social interest. Streamlining the battery using only high-performing items allowed removal of 70% of the items, reducing experimental burden from 30 to approximately 7 minutes while increasing measurement performance.

Conclusions:

The results of this research are immediately applicable to more accurately measure social interest in autism and optimizing experimental designs to be maximally informative.

428.137 A Cross-Sectional Investigation of Dynamic Attention Among Autistic and Non-Autistic Children and Adolescents

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Background: With the advent of the neurodiversity movement, common deficit narratives about visual attention and social functioning by autistic individuals have been recast in terms of alternative styles and ways of processing, some of which may reflect unique strengths (e.g., Ames & Fletcher-Watson, 2010; Burack et al., 2016). Moreover, to gain a better understanding of the attentional styles of autistic individuals, ecologically valid paradigms should be adapted to capture the dynamic and complex social and non-social stimuli in the real-world environment (Birmingham et al., 2012).

Objectives: The focus of the present study was to compare the performance of autistic and non-autistic children and adolescents on three-dimensional (3D) dynamic versions of the biological motion (social; Johansson, 1973) and multiple object tracking (non-social; Pylyshyn & Storm, 1988) visual attention tasks.

Methods: The participants included 27 children and adolescents diagnosed with autism ($M_{CA} = 11.19$, $M_{MA} = 9.90$) matched on MA to 27 non-autistic children and adolescents ($M_{CA} = 8.81$, $M_{MA} = 9.53$) between the chronological ages (CA) of 6-17 years. The autistic and non-autistic participants were further divided into two mental age (MA) groups (lower MA: 4-10 years; higher MA: 11-18 years) to clarify the developmental patterns in performance on the attention tasks.

Results: The main findings indicate no differences in performance on the biological motion task between the autistic and non-autistic groups nor between the MA groups. Additionally, on the multiple object tracking task, no differences in performance were found between the autistic and non-autistic groups, but the higher MA group performed better than the lower MA group for the autistic and non-autistic participants.

Conclusions: These findings suggest developmental similarities between MA-matched autistic and non-autistic children and adolescents in their performance on more ecologically relevant adaptations of commonly used dynamic attention tasks.

428.138 Working Memory and Language Development in Autistic Preschoolers: A Bidirectional Exploration

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Background: Executive function (EF) has been suggested as an effective predictor of language acquisition. EF refers to top-down cognitive processes that are crucial for regulation of thoughts and actions. Past research has shown that autistic individuals demonstrate delays in executive functioning (Howard et al., 2023). Few longitudinal studies have been conducted to establish a bidirectional relationship between EF and language development in preschool children. Veraksa and colleagues (2018) demonstrated a relationship between the individual components of executive function (working memory, inhibition, and cognitive flexibility) and spoken language skills in older preschool aged children. They found significant associations between individual EF components and language development in preschool children. Their analysis showed that the level of language development is significantly associated with scores on working memory tasks. Working memory is an EF subdomain that involves manipulating information in memory to solve more complex problems. Autistic children often have difficulty with working memory and language development appears closely related to concurrent working memory ability. Yet, the longitudinal relation between working memory and language development still needs further investigation.

Objectives: To explore the bidirectional relationship between working memory and language development over time in autistic preschoolers.

Methods: Longitudinal data have been collected from a sample of 29 autistic children (28.6% female, Time 1 Age M = 31 months, SD = 3.22). Children were assessed at baseline and three years later including developmental testing and an EF battery. Language development was measured using the verbal developmental quotient from the Mullen Scales of Early Learning (Mullen, 1995). The working memory battery consisted of three behavioral activities: Boxes (Diamond et al., 1997), Self-Ordered Pointing (Petrides & Milner, 1982), and Hide and Seek (Garon et al., 2014). Working memory composite scores were computed at each timepoint from z-scores. Linear regressions were run to investigate the relationship between working memory skills and language development in young autistic children.

Results: Preliminary analyses show that initial language level predicted working memory two years later, $\beta = .384, p = .04$. However, when examining whether working memory at the participant's first assessment predicted language level two years later only a trend effect was detected, $\beta = .384, p = .06$.

Conclusions: Findings suggest that language scores at age two predict future working memory skills in preschool-aged children. This is consistent with the existing literature showing a close relationship between EF and language development. Previous research indicates that EF is a predictor of later language acquisition, but with our current sample that included many children with at least single words, the role of language in the subsequent development of working memory is clearer. A nonsignificant relation between initial working memory and later language could be due to our small sample size as the study is ongoing. As we collect additional longitudinal data, we will be able to fully test the bidirectional relationship between working memory and the different facets of language development. These findings are essential for understanding how children's early skills impact later development and can inform future interventions for autistic children.

428.139 Attention and Executive Delays in Early Childhood: A Meta-Analysis of Neurodevelopmental Conditions

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Background: In the first years of life, children develop core cognitive capacities that are crucial for lifelong skills. Attention and executive function (EF) are believed to be particularly important, as they underpin adaptive and goal-directed behaviour. Delays in attention and EF have been associated with atypical brain development and various neurodevelopmental conditions, including autism, ADHD and intellectual disabilities. This has led to suggestions that attention and EF delays may be core transdiagnostic features of neurodevelopmental conditions. However, it remains unclear whether these delays can be identified in the first years of life.

Objectives: The first objective of this systematic review and meta-analysis was to determine, using a transdiagnostic approach, whether and when children with (or at risk of) neurodevelopmental conditions demonstrate delays in attention and EF in the first 5 years of life, compared to neurotypical (or low risk) peers. A second objective was to examine the different factors (age group, sex distribution, specific diagnosis, type of measure) that may moderate attention and EF delays. Finally, we aimed to explore whether the early attention and EF impairments in children with neurodevelopmental conditions are related to divergences in their structural and/or functional brain development.

Methods: MEDLINE, EMBASE, and PsycINFO databases were searched to June 30, 2023, and studies comparing attention or executive function between children with (or at risk for) neurodevelopmental conditions and neurotypical (or low risk) peers, 0 to 5 years old, were included. Of the 4338 studies identified, 111 studies with 12292 participants were included in the meta-analysis. The qualitative analysis of brain development included 5 studies. Primary outcomes were the standardised mean difference (Hedges' g) in attention and executive function between groups. Meta-regressions examined moderating effects of age, biological sex, diagnosis, and measure type.

Results: Our quantitative analysis showed that children with neurodevelopmental conditions showed small delays in attention ($n=49$ studies, $k=251$ outcomes, $g=0.36$, 95% CI 0.23-0.48, $p<0.001$) and moderate delays in executive function ($n=64$ studies, $k=368$ outcomes, $g=0.64$, 95% CI 0.53-0.76, $p<0.001$). Attention and executive function delays could not be identified in the first year, small to moderate delays were found in toddlerhood and moderate delays were observed by preschool. Delays identified were largely transdiagnostic, although there was some evidence of diagnosis-specific delays for attention and moderation by measure type (informant rating vs performance-based vs physiological). Our qualitative analysis describes how delays were underpinned by a divergence of brain development in medial prefrontal regions.

Conclusions: This study shows that attention and EF delays in individuals with neurodevelopmental conditions emerge prior to the age of 5, such that delays that are difficult to detect in infancy, begin to manifest in toddlerhood, and are further pronounced into the preschool years. These findings together contend that transdiagnostic detection and intervention approaches from toddlerhood are feasible and imperative to reduce lifelong impacts for children with neurodevelopmental conditions.

Poster Session

429 - Epidemiology II

May 2nd, 2025, 6:00 PM - 7:00 PM - Hall 4A

429.140 Maternal History of Abuse and Offspring Autism Spectrum Indicators

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Background: Autism spectrum disorder (ASD) is a common neurodevelopmental disorder where affected individuals suffer from social isolation, poor mental health, and delayed language development, and is being diagnosed at increasing rates. Several studies have found correlations between ASD and stress experienced by the child's mother during pregnancy or delivery, however there is little information regarding whether stress experienced prior to pregnancy is linked with ASD incidence in children. To our knowledge, only one study with a racially homogenous sample identified such a correlation.

Objectives: This study examined whether maternal experience of abuse throughout life (separated into child abuse of any type, sexual abuse as an adult, or physical abuse as an adult) predicted offspring ASD suspicion or diagnosis prior to age three.

Methods: Medical records (n=214) were reviewed from two pediatric practices in socioeconomically diverse areas of the Midwestern U.S. "Maternal abuse experience" was positive if experiencing abuse was reported in the patient history form, either during prenatal care or at admission to the hospital for delivery. ASD concern (on behalf of the pediatrician) or diagnosis was positive if either was indicated in the child's medical record by the age of three. Analyses were run using binary logistic regression, controlling for potentially confounding factors including (but not exclusive to) maternal age, maternal substance use during pregnancy, child's birth weight, and child comorbid conditions.

Results: Of the 214 charts analyzed, 111 women reported that they never experienced abuse, 54 women reported that they experienced abuse, and 49 women declined to answer. Of the 54 women who reported abuse, 24 reported that they had experienced child abuse of some type. Compared to those who reported no abuse, mothers who experienced abuse of any type were three and a half times more likely to have a child suspected of ASD prior to age three [3.48 (1.60-7.56)]. In addition, mothers who specifically experienced child abuse had a nearly two-fold risk for having a child suspected of or diagnosed with ASD, however this relationship did not reach statistical significance in this smaller sample [1.97 (0.65-6.02)].

Conclusions: Study findings provide insight into the potential pathogenesis of ASD, possibly suggesting epigenetic links at play. By identifying prior maternal abuse as a potential ASD risk factor, pediatricians can be on the lookout for ASD symptoms in their patients at an earlier age, allowing for earlier intervention and better overall outcomes.

**429.141 Maternal Mediterranean-Style Diet during Pregnancy and Child Social Impairment As Measured By the Social Responsiveness Scale: A Prospective US Birth Cohort Study**

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Background:

While previous studies have reported the role of individual micronutrients in the etiology of autism spectrum disorder (ASD), there is limited and inconsistent evidence for the relationship between maternal diet patterns during pregnancy and social interaction and communication more broadly.

Objectives: To evaluate the association between a Mediterranean-style diet during pregnancy and the severity of social impairment in a racially diverse birth cohort.

Methods: In total, 822 mother-child pairs from the Boston Birth Cohort with relevant data were included in the analysis, including 52 children with an ASD clinical diagnosis. Mediterranean-style Diet Scores (MSDS) during pregnancy were calculated using food frequency questionnaires that were administered within 24 to 72 hours after delivery. The Social Responsiveness Scale (SRS) was used to measure the severity of social impairment in childhood. Restricted cubic splines were plotted to explore a potential non-linear relationship between SRS total scores and MSDS during pregnancy. Linear regressions were applied to quantify the association between MSDS during pregnancy (in tertiles) and child SRS raw scores (total scores and scores of five subdomains).

Results: There was an L-shape association between MSDS during pregnancy and SRS total raw score. Compared to the offspring of women with the lowest MSDS tertile, those with MSDS in the middle (beta (95%CI) = -4.98 (-9.57, -0.38)) and highest tertiles (-5.21 (-9.43, -0.99)) had lower SRS total scores, indicating a decreased level of social impairment. Particularly, maternal MSDS during pregnancy was significantly associated with performance in subdomains of social cognition and social communication.

Conclusions: This study found that greater adherence to a Mediterranean-style diet during pregnancy was associated with children's better social interaction and communication development. The findings emphasize the importance of maternal nutrition during pregnancy in child neurodevelopment and suggest potential targets for early risk assessment and prevention.

**429.142 Maternal Prenatal Depression and SSRI Use and Risk of Child Autism Spectrum Disorder**

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Background: There remain unanswered questions regarding the neurodevelopmental consequences of prenatal exposure to maternal SSRI use.

Objectives: To evaluate the associations of prenatal depression and SSRI use with autism spectrum disorder (ASD)

Methods: We conducted a population-based retrospective cohort study of pregnant individuals seeking care at Kaiser Permanente Northern California (KPNC) between January 1, 2013 and June 30, 2021. KPNC is an integrated healthcare delivery system with universal prenatal depression screening using the Patient Health Questionnaire (PHQ-9) at multiple time points throughout pregnancy. Prenatal depression severity was defined by maximum PHQ-9 score: none (0-4), mild (5-9), moderate (10-14), and severe (≥ 15); prenatal SSRI medication use (proportion of gestational days covered (PDC)); timing (trimester(s)); effect modification by child sex. ASD was defined by diagnoses recorded in the child's KPNC electronic health record from birth through June 30, 2023. (ICD-9: 299, 299.01; ICD-10 F84, F84.0, 299.8, 299.81, F84.5, F84.8, 299.9, 299.91, F84.9). Cox proportional hazards models including both primary exposures of depression severity and SSRI use were fit overall and by infant sex, adjusting for maternal and paternal sociodemographic characteristics, maternal and paternal mental health comorbidities and treatment, maternal medical comorbidities, adequacy of prenatal care, and prenatal substance use. Sensitivity analyses excluding pregnant individuals with only 1 SSRI prescription were conducted.

Results: The cohort included 276,976 pregnancies born to 217,462 pregnant individuals.

The cohort was on average (SD) 30.7 years (5.1) of age, 27.3% Asian, 6.0% Black, 25.1% Hispanic, and 38.5% White; 10.2% of the pregnancies were insured by Medicaid. Of pregnancies, 37,711 (11.8%) were to individuals with a prenatal depression diagnosis, 12,255 (4.4%) to individuals taking SSRIs. Prenatal depression symptoms were documented as 60,434 (24.2%) mild, 17,281 (6.9%) moderate, and 8,350 (3.3%) severe. There were 11,077 (4.0%) children diagnosed with ASD in the cohort.

Depression symptom severity was associated with ASD after adjustment for potential confounders (versus no depression symptoms; mild HR: 1.16, 95%CI: 1.11-1.22; moderate HR: 1.26, 95%CI: 1.17-1.36; severe HR: 1.20, 95%CI: 1.08-1.32); No significant differences were noted between males and females. An increased risk of ASD was found for prenatal SSRI use >33%-66% of gestational days (HR:1.17, 95%CI: 1.01,1.35) and >66% gestational days (HR:1.17, 95%CI: 1.01,1.35) compared to no use. Prenatal SSRI use in all three trimesters (HR:1.19, 95%CI:1.02-1.37) and 3rd trimester only (HR:1.45, 95%CI:1.12-1.86) compared to no use was associated with an increased risk of ASD. Sensitivity analyses excluding pregnant individuals with one SSRI fill, found similar trimester-specific associations with ASD in males, but not females. Sensitivity analyses support the main findings.

Conclusions: Findings suggest prenatal depression is associated with ASD risk, and that prenatal SSRI use may confer additional risk of ASD when SSRI use is continued for more than a third of pregnancy or initiated in the third trimester. However, the observed associations between SSRI use and ASD risk may be an artifact of exposure misclassification or severity-SSRI use time ordering. Findings can help clinicians and pregnant patients make informed treatment decisions and identify children for targeted early interventions to support healthy development.

429.143 Newborn IgG Antibodies to Maternal Sars-Cov-2 Infection in Pregnancy and Child Neurodevelopmental Outcomes

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Background: Gestational exposure to infection has been linked with neurodevelopmental disorders (ND). Maternal immune activation is the hypothesized mechanism by which prenatal exposure to infection adversely impacts fetal brain development. Levels of SARS-CoV-2 IgG class antibodies generated to viral proteins in the beginning of pregnancy remain detectable at later stages and are transferred across the placenta to the newborn. Thus, the immune profile of the newborn reflects maternal infection, and as such, newborn screening bloodspots are an ideal sample with which to investigate the impact of maternal SARS-CoV-2 infection in pregnancy on child neurodevelopment.

Objectives: To investigate the association between neonatal levels of IgG antibodies to SARS-CoV-2 nucleocapsid and spike proteins and risk of ND among children with gestational SARS-CoV-2 exposure.

Methods: In this longitudinal prospective cohort study, we obtained newborn screening bloodspots from 399 children born at Kaiser Permanente Northern California (KPNC) between April 2020 and September 2021 to mothers who had SARS-CoV-2 infection during pregnancy and had not received the SARS-CoV-2 vaccination. IgG class antibodies to recombinant SARS-CoV-2 nucleocapsid and spike proteins were measured in dried bloodspots using multiplex chemiluminescent immunoassay procedures. All ND diagnoses recorded in children's electronic health records by May 31, 2024 were retrieved and categorized as any ND, autism spectrum disorder (ASD), speech/language delay, or motor delay. We generated separate Cox proportional hazards regression models to estimate hazard ratios (HR) and 95% confidence intervals (CI) for each child outcome associated with the level of IgG antibodies to the SARS-CoV-2 nucleocapsid and spike proteins. Children were followed from 3 months of age until the date of the first ND diagnosis, the date they left the KPNC health system, death, or May 31, 2024, whichever occurred first. Multivariate models included adjustment for maternal age, pre-pregnancy obesity, season of childbirth, trimester of maternal infection, and child sex. Effect modification by child sex and trimester of infection was also evaluated.

Results: Among the 399 children, 69 (17.3%) had a diagnosis of ND (19 ASD, 63 speech/language delay, 11 motor delay). SARS-CoV-2 nucleocapsid IgG antibody level was not associated with risk of ND overall (aHR=1.11, 95% CI [0.93-1.33]), ASD (aHR=1.05 [0.74-1.48]), speech/language delay (aHR=1.19 [0.99-1.43]), or motor delay (aHR=0.81 [0.49-1.32]) in adjusted analyses. However, associations differed significantly by child sex, with increased risk observed only among males (ND: aHR=1.28 [1.02-1.61]; ASD: aHR=1.47 [0.92-2.34]; speech/language delay: aHR=1.37 [1.08-1.73]; motor delay: aHR=1.32 [0.63-2.80]). Risk also differed by trimester of maternal SARS-CoV-2 infection, with over 2-fold increased risks observed with first trimester (ND: aHR=2.21 [1.10-4.45]; speech/language delay: aHR=2.33 [1.09-4.98]) and second trimester (speech/language delay: aHR=2.23 [1.20-4.13]) exposure. Results were similar for associations with the level of IgG antibodies to the SARS-CoV-2 spike proteins.

Conclusions: Higher levels of neonatal antibodies to maternal SARS-CoV-2 infection in pregnancy may indicate increased risk for ND. If replicated, these findings suggest that newborn antibody testing of male infants with prenatal SARS-CoV-2 exposure may provide a novel avenue for early identification of infants at risk for ND and opportunities for early intervention and prevention of adverse child outcomes.



429.144 Parental Age and Autism Spectrum Disorder: The Mediating Role of Parental Education

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Background: Older parental age, which potentially harbors several underlying mechanisms, is commonly associated with various developmental disorders, including autism spectrum disorder (ASD) (Chu et al., 2023; Sandin et al., 2016). Maternal education has been found to mediate the relationship between ASD diagnosis compared to a typical control group (Kelly et al., 2019; Lung et al., 2018; Veldkamp et al., 2021). However, how this mechanism differs among children with ASD and those with other neurodevelopmental disorders (NDDs) remains underexplored. **Objectives:** This study aimed to examine whether parental education mediated the association between maternal and paternal ages and diagnosis (i.e., ASD or a different NDD).

Methods: Participants included individuals who received an interdisciplinary comprehensive ASD assessment between years 2006 through 2020 ($N = 673$, $M_{\text{age}} = 5.67$ years, $SD = 3.42$, ages ranged from 1 year to 18 years old, 77.27% male). Structural equation modeling (SEM) was performed to assess both the direct effects of maternal and paternal ages on ASD diagnosis and the indirect effects of parental education on the association between maternal and paternal ages at birth on ASD diagnosis. The model was estimated using weighted least squares mean and variance adjusted (WLSMV), with autism diagnosis included as a binary variable. Bias-corrected bootstrap analysis was conducted to assess the mediating effects of parental education in the relationship between maternal and paternal ages on ASD diagnosis. Sex, age at ASD evaluation, and birth order were included as covariates in the analysis.

Results: After controlling for sex, participant's age at evaluation, and birth order, mediation analyses revealed that higher maternal age at birth was positively related with increased likelihood of ASD diagnosis ($\beta = 0.21$, $p = .003$). Higher parental education was also positively related with ASD diagnosis ($\beta = 0.17$, $p = .001$). Higher maternal age at birth had an indirect effect through parental education on higher likelihood of ASD diagnosis ($\beta = 0.07$, $p = .004$) over a different NDD diagnosis. Paternal age did not significantly predict ASD diagnosis in the sample.

Conclusions: This study uniquely contributes to previous literature by examining the differences in the relationship between parental age, parental education, and ASD diagnosis using a comparison group consisting of other NDD rather than a typically developing group. This study suggests that higher maternal age and greater parental education are associated with an increased likelihood of an ASD diagnosis (Idring et al., 2014; Kelly et al., 2019) compared to non-ASD diagnoses (such as different NDDs). Additionally, similar to previous studies, parental education, while playing a minimal but significant role, suggests higher education may influence ASD diagnoses (Lung et al., 2018), indicating a potential underlying role of knowledge about ASD, and higher socio-economic status (SES), which likely increases access to services. Unlike previous findings, paternal age did not predict ASD diagnosis in this sample (Sandin et al., 2016). Overall, understanding factors associated with ASD diagnosis are important for targeting parental education related to autism and efforts for early identification.



429.145 Preliminary Study of Differences in Ethnoracial Distributions across Autism and Gender Diversity

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Background: Evidence indicates disparities by race and ethnicity in rates of autism diagnosis and in participation in both autism and gender diversity-related research. Given: (1) the proportional over-representation of autism in gender diverse populations and (2) ethnoracial disparities in clinical care access and research participation observed in both autism and gender diversity, we predict: ethnoracial disparities in research representation will be pronounced in autistic gender diverse populations.

Objectives: Employing the standardization sample for the Gender Self-Report (Strang et al., 2023), this study investigates whether the distribution of ethnoracial identities varies across autistic vs. non-autistic cisgender vs. gender diverse subgroups.

Methods: The standardization sample for the Gender Self-Report (GSR; $N = 1654$; Strang et al., 2023) was recruited through 7 independent recruitment efforts across the U.S., with the intention of diversifying representation across autism, gender diversity, and the intersection of autism and gender diversity. For this current study, chi-squared tests were conducted across Black ($n = 115$), Asian ($n = 162$), and Latine/o/a ($n = 144$) subgroups, to test for proportional differences between: (A) non-autistic cisgender vs. non-autistic gender diverse; (B) non-autistic gender diverse vs. autistic gender diverse; and (C) cisgender autistic vs. gender diverse autistic. The priority in these analyses was to avoid Type II, not Type I error, as this study explores potential disparities in representation; for this reason, both uncorrected p values and p values adjusted by False Discovery Rate are presented.

Results: Proportionally, there were fewer Black and Asian gender diverse non-autistic as compared to cisgender non-autistic participants. Such differences were not found for Latine/o/a participants, though the chi-square approached significance before multiple comparison correction (uncorrected $p = .07$). Contrary to our hypothesis, proportional representation of Black, Asian, and Latine/o/a individuals did not differ between gender diverse autistic versus non-autistic groups. Further, ethnoracial proportions between cisgender autistic and gender diverse autistic participants did not differ.

Conclusions: This is the first study to investigate proportional distributions of race and ethnicity in autistic cisgender and autistic gender diverse groups. Although racial disparities in research recruitment were observed in the non-autistic groups (i.e., cisgender vs. gender diverse), no ethnoracial disparities were observed by intersectional autism and gender diversity. Reflections within the autistic community suggest that characteristics of autism may help gender diverse people to more readily express gender diversity; given current findings, this may be observed across ethnic and racial identities.



429.146 Prevalence of Co-Occurring Mental, Neurodevelopmental and Neurological Conditions in Medicaid Beneficiaries with Autism Spectrum Disorder

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Background: Healthcare utilization and costs are significantly higher for individuals with autism spectrum disorder (ASD) compared to the general population, partly because of co-occurring health conditions. As ASD prevalence rises and more youth diagnosed with ASD transition to adulthood, epidemiologic data on co-occurring conditions throughout the lifespan are essential for understanding the healthcare needs of people with ASD.

Objectives: Describe the prevalence of co-occurring mental, neurodevelopmental and neurological conditions among Medicaid beneficiaries with ASD, overall and by demographic characteristics.

Methods: This descriptive epidemiological study analyzed Medicaid claims data, which include individual-level claims for outpatient, inpatient, and long-term care services among people enrolled in Medicaid, the largest health insurance program in the United States (US) and the primary public insurance program for people with ASD. We identified all individuals who had a diagnosis of ASD in 2019 to 2020 based on ICD-10-CM codes on ≥ 1 inpatient claim or ≥ 2 other non-drug claims of any service type. We identified additional mental, neurodevelopmental and neurological diagnoses using the same algorithm for relevant codes. Frequencies were calculated for the total sample and by age, gender and race/ethnicity.

Results: We identified 994,164 Medicaid beneficiaries with ASD. Most (75.4%) were ages ≤ 20 , 20.8% were 21-44, 3.1% 45-64, and 0.7% 65+; 76.9% were male. The largest racial/ethnic group was non-Hispanic White (NHW) (43.6%), followed by Hispanic any race (17.7%) and non-Hispanic Black (NHB) (12.64%); 21.8% were missing race/ethnicity. The most common co-occurring condition was attention-deficit/hyperactivity disorder (ADHD), with a prevalence of 30.5%. Other commonly co-occurring conditions included intellectual disabilities (ID) (20.4%), anxiety (19.3%), bipolar disorder (9.9%), depression (9.0%), epilepsy (8.0%) and cerebral palsy (2.4%). Prevalence varied by age group (Figure 1). ADHD prevalence was highest at 15-24 years (37%), declining with age. Anxiety and bipolar disorders peaked at ages 25-64. Prevalence of ID, depressive disorder, epilepsy and cerebral palsy increased with increasing age. All conditions except ADHD were more common in females. Prevalence also varied by racial/ethnic group (Figure 2). ADHD was the most prevalent condition in all groups except American Indian/Alaskan Native (AI/AN), among whom ID was most prevalent. Anxiety, bipolar and depressive disorders were all less commonly diagnosed in NHB, AI/AN and Hispanic individuals. For most conditions, NHW and multiracial individuals had the highest prevalence and AI/AN and Hispanic individuals the lowest.

Conclusions: Among nearly 1 million publicly-insured individuals with ASD in the US, mental, neurodevelopmental and neurological conditions were common across the lifespan. Differences by age and gender may reflect underdiagnosis of ASD in previous generations and among females, respectively, in the absence of ID or other co-occurring conditions. Racial/ethnic disparities may result in part from less access to mental health services, despite being insured, leading to underdiagnosis of co-occurring conditions. Screening for ADHD in adults with ASD, and for anxiety and depressive disorders in youth and adults with ASD, especially those from disadvantaged populations, may improve health outcomes. The high prevalence of potentially disabling co-occurring conditions across the lifespan has important implications for meeting healthcare needs in individuals with ASD as they age.



429.147 Sex- and Timing-Specific Associations between Prenatal Glucose Intolerance Exposures and Child Neurodevelopmental Outcomes

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Background: Gestational diabetes mellitus (GDM) is associated with increased risk of autism spectrum disorder (ASD) and developmental delay (DD). However, few studies have examined whether associations differ by timing of GDM diagnosis or child sex, and none have examined sub-clinical impaired glucose tolerance as a separate risk factor. Given standard screening and diagnostic practices and availability of treatments, management of GDM and impaired glucose tolerance represents avenues for prevention of adverse child outcomes. A better understanding of the relationship between prenatal glucose intolerance and risk of neurodevelopmental disorders (NDDs) can also provide insight into etiologic mechanisms.

Objectives: To determine associations between prenatal glucose intolerance and risk of child ASD and DD and examine whether associations differ by timing of GDM diagnosis and child sex.

Methods: We ascertained a case-control sample of mother-child pairs from children born at Kaiser Permanente Northern California (KPNC) between January 2011 and December 2018. Children were categorized as having ASD, DD, or as general population controls (GP) based on diagnoses in electronic health records (EHR). GDM was defined according to two-step Carpenter and Coustan diagnostic criteria based on laboratory testing in maternal EHR and categorized into early and standard subgroups by gestational age (early: ≤ 26 weeks; standard: >26 weeks). Impaired glucose tolerance (IGT) was separately defined by elevation of 50-gram glucose screening and/or one glucose elevation for the diagnostic test, with GDM diagnosis. We estimated risk of ASD and DD associated with prenatal exposures using logistic regression models adjusted for child sex, birth year, parity, maternal age at birth, race, education, and pre-pregnancy BMI. Effect modification by child sex was evaluated using stratified analyses and models including sex-by-exposure interaction terms.

Results: The study sample of 4,716 mother-child pairs included 710 children with ASD, 2,135 with DD and 1,871 GP controls; there were 573 (12.1%) mothers with GDM and 64 (1.4%) with impaired GT. There was no evidence for increased risk of ASD or DD associated with GDM diagnosed at any gestational age (ASD OR [95% CI]=1.12 [0.84-1.48]; DD OR=1.20 [0.98-1.47]). Risk of ASD associated with exposure to GDM ≤ 26 weeks was increased among females (OR=2.21 [0.96-4.80]) but not males (OR=0.88 [0.51-1.50], sex-by-exposure interaction $P < 0.05$). GDM diagnosed >26 weeks' gestation was associated with elevated risk of DD, also among females only (OR=1.42 [0.99-2.04]). Children born to mothers with IGT had significantly increased risk of DD among the full sample (OR=1.81 [1.01-3.34]) and this risk was further elevated among females (OR=3.23 [1.33-8.61]) but not males (OR=1.10 [0.51-2.45]).

Conclusions: Risks of ASD and DD were associated with prenatal glucose intolerance—both GDM and IGT—in a timing- and sex-specific manner. Earlier GDM diagnosis was associated with increased ASD risk only among females, suggesting possible sex differences in the relevant exposure window for fetal programming mechanisms underlying risk. This is also the first study to identify sub-clinical impaired glucose tolerance as a risk factor for NDDs separate from non-GDM referent. Expanding treatment recommendations to include this group may have implications for child health, including primary prevention of NDDs.



429.149 The Association between Motor and Social Skills in Young Children with Autism Enrolled in the Study to Explore Early Development

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Background: The attainment of motor milestones is often more easily observable than social skill milestones early in child development. Previous research investigating the relationship between motor and social skills in autism has found a reciprocal relationship, with motor development allowing for increased social opportunities, and social skills playing a role in activity participation for strengthening motor skills. A better understanding of the association between motor and social skills could lead to interventions to improve skill acquisition and developmental outcomes for individuals with autism.

Objectives: 1) To describe motor and social impairments among preschool-aged children with autism; and 2) to evaluate whether motor skills are positively associated with social skills.

Methods: We analyzed cross-sectional data from children aged 2-5 years recruited between 2007 and 2020 for a multi-site, multi-year, case-control study exploring risk factors and developmental characteristics of autism in the United States. Children were confirmed to have autism based on the Autism Diagnostic Interview-Revised and the Autism Diagnostic Observation Schedule. Caregivers completed the Social Responsiveness Scale (SRS) questionnaire to assess their child's social skills in relation to autism. An SRS Total t score ≥ 76 indicated severe impairment. Caregivers also reported adaptive behavior using the Vineland Adaptive Behavior Scales (Vineland). A score of ≤ 70 on the Vineland Socialization domain or Motor Skills domain indicated low social or motor skills, respectively. Linear regression models were built to evaluate the association between motor skills (primary predictors: Vineland Motor Skills standard score, Vineland Gross Motor subdomain v-scale score, or Vineland Fine Motor subdomain v-scale score) and social skills (outcome variables: SRS total t-score or Vineland Socialization standard score).

Results: Among the 2,052 children meeting study autism criteria, the average Vineland Motor Skills standard score was 79.1 (standard deviation, SD=13.1), with 29.0% classified as having low motor skills. Average social skills were 72.5 (SD=10.9) on the SRS Total t score and 71.8 (SD=12.1) for the Vineland Socialization domain standard score. Severe impairment (SRS) and low social skills (Vineland Socialization) were observed in 39.9% and 49.6% of the sample, respectively. Each motor score was positively associated with higher Vineland Socialization scores, with the strongest association observed between Vineland Motor Skills and Vineland Socialization standard scores ($R^2=0.368$; $p\text{-value} < 0.001$). Motor scores were negatively associated with SRS scores, indicating that higher motor ability was associated with lower social impairment. Compared to gross motor skills scores, fine motor skills had stronger associations with both the Vineland and SRS measures of social skills.

Conclusions: This study found almost a third of preschool-aged children with autism had motor impairment and a significant association between motor and social skills. These findings underscore the potential importance of considering motor skills in diagnostic assessments of autism and in developing appropriate interventions and therapies. Future research could explore how the association between motor and social skills evolves across the lifespan and investigate its implications for developmental outcomes.



429.150 The Design Research of Mapa Autismo Brazil - Mab: Sociodemographic and Clinical Profile of Autistic People

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Background:

In 2023, MAB (Autism Map Brazil), a non-governmental research was carried out in the Federal District. This study aimed to fill the gap in sociodemographic data on the country's autistic population. This presentation is MAB's design to be carried out nationwide in the 27 states in 2025.

Objectives:

The purpose of this study is to collect data and analyze the sociodemographic and clinical profile of autistic people looking at issues such as age, income, economic class, schooling, employability, access to health services and public policies, diagnostic data, symptoms, comorbidities, and the types of services used in Brazil.

Methods:

The MAB is a quantitative, cross-sectional, and non-probabilistic convenience sampling research. It uses online surveys presented via the SurveyMonkey platform. The first one will be aimed at autistic individuals aged 18 or over with autonomy to answer. The other will be aimed at caregivers or guardians of autistic individuals who are minors or unable to answer the questionnaire independently.

These surveys will be published on websites, and social media and through institutional partnerships with associations that work with autism audiences, universities, schools, research centers, companies, hospitals and clinics, and research volunteers.

The sample will be distributed proportionally among the Brazilian geographic meso-regions to ensure that all areas are represented. It takes into account regional differences in terms of access to services and diagnosis. Data collection will be segregated by biological gender to identify differences in prevalence and sociodemographic characteristics between boys and girls, as well as men and women.

Considering the prevalence rate of 2.1%, the estimated population of autistic people in Brazil is 4.264.696 individuals. The sample calculation used stricter criteria, with a 95% confidence level and a 5% margin of error, resulting in a desired sample of 10.320 respondents. This number was distributed proportionally to each Brazilian state.

For data analysis, machine learning algorithms such as clustering analysis and others could be used to identify profiles and explore the data. This approach can make it possible to discover significant patterns and relationships, enriching the understanding of the data collected.

Results:

The project was approved by the Ethics Committee of the University of Brasilia (CAAE: 70226623.9.0000.5540). In the current phase, 455 institutional partnerships have already been established, distributed among the 27 states, to disseminate the data collection instruments. The data collected will take place between March and April 2025. The data from the pilot study has already been published on the website <https://www.mapaautismobrasil.com.br/> in Portuguese and English, and will be updated as soon as the new data collected is analyzed.

Conclusions:

The MAB results are fostering different academic research. In addition, MAB has supported the development and updating of public policies and services aimed at the autistic population. The data collection will be repeated every two years to update the information based on the sociodemographic and clinical profile of autistic people in Brazil.

429.151 The Impact of Maternal Depression, Anxiety, and Stress on Early Autism-Related Traits

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Background: Perinatal mental health is increasingly recognized as a significant environmental factor influencing offspring neurodevelopment, particularly in relation to autism. However, its effects on autism-related traits in offspring remain uncertain.

Objectives: N/A

Methods: We obtained data from 2,207 healthy mother-child pairs in the Shanghai Birth Cohort (SBC). Maternal mental health was assessed at mid-pregnancy using the Center for Epidemiological Studies-Depression Scale (CES-D), Zung Self-Rating Anxiety Scale (SAS), and Perceived Stress Scale (PSS). Autism-related traits in offspring were evaluated at 4 years using the Social Responsiveness Scale-Short Form (SRS-SF), which included factors of social cognition, social communication, and autistic mannerism. Pearson correlation and multiple linear regression analyses were used.

Results: Associations were observed between maternal depression, anxiety, elevated stress, and offspring SRS-SF total scores at age 4 ($r = 0.14$, $P < 0.001$; $r = 0.08$, $P = 0.002$; $r = 0.09$, $P = 0.002$, respectively). After adjusting for maternal factors (age, socioeconomic status, smoking, alcohol use) and child factors (gender, gestational age at birth), each 1SD increase in maternal mental health scores was associated with an increase in offspring's SRS-SF total score: 0.19 (95% CI: 0.06, 0.32) for depression, 0.09 (95% CI: 0.06, 0.13) for anxiety, and 0.08 (95% CI: 0.03, 0.11) for stress. Associations were also observed for SRS-SF social cognition and social communication subscales.

Conclusions: Prenatal maternal depression, anxiety, and stress were associated with increased autism-related traits in early childhood. These findings enhance our understanding of the role of maternal prenatal mental health in the neurodevelopmental origins of non-clinical autism-like traits.

429.152 The Prevalence and Cumulative Incidence of Autism across Utah's Local Health Districts 2018

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Background: The Utah Registry of Autism and Developmental Disabilities (URADD) was established in 2002 as a joint effort between the Utah Department of Health and Human Services and the University of Utah Department of Psychiatry. URADD uses a passive, population-based system to identify persons across the lifespan with autism based on a community medical diagnosis of autism and/or an autism special education eligibility. While autism prevalence is frequently reported statewide in Utah, little is understood about how autism prevalence and incidences vary at the local health district (HD) level. An improved understanding of differences in autism prevalence and incidence across HDs is essential for meeting the service needs of autistic individuals in Utah.

Objectives: Determine and compare autism prevalence and cumulative incidence across Utah's local health districts and examine differences in prevalence across demographic factors.

Methods: The number of autistic individuals aged 5-24 (youth) in 2018 living in Utah were identified by URADD. Local health district population estimates were acquired from the Utah Indicator-Based Information System for Public Health. For the crude prevalence estimates, the Wilson score method with continuity correction was used to estimate 95% confidence intervals (CI). Prevalence ratios (PR) and 95% confidence intervals were estimated across race/ethnicities and HDs using Wald's method. A single birth cohort of youth born in 2002 was selected to estimate cumulative incidence of the age of first ICD identification of autism by HD. Cumulative incidence at ages 4, 8, 12 and 16 years in the 2002 birth cohort were compared across HDs using risk ratios. Salt Lake City Health District (SLCHD) was chosen as the reference group.

Results: Autism prevalence in 2018 in SLCHD was 23.9 per 1000 youth (95% CI: 23.4, 24.4). Davis County HD had the highest autism prevalence (PR: 1.12, 95% CI: 1.08, 1.16; Table 1). Except for Tooele County HD, all other HDs had significantly lower autism prevalence than SLCHD (PRs: 0.32 – 0.86). The prevalence ratios across White Non-Hispanic (NH) and Hispanic individuals among HDs mostly reflected the overall HD prevalence ratios; however, autism prevalence amongst Black NH individuals was only different from SLCHD in Davis County HD (PR: 1.54, 95% CI: 1.08, 2.22). Hispanic autism prevalence was significantly lower than White NH autism prevalence in 9 of the 13 HDs. Cumulative incidence (Figure 1) among 4-year-olds did not statistically differ across HDs. However, cumulative incidence differed by some HDs at 8 and 12 years of age (RR: 0.08 - 0.66). At 202 months, Bear River, TriCounty, Utah County, Wasatch County, and Weber Morgan HDs' cumulative incidence were significantly lower than SLCHD.

Conclusions: Autism prevalence among school age children and young adults varied considerably across HDs and by race/ethnicity suggesting potential regional differences in access to autism diagnostic services and/or ascertainment completeness. In contrast, the likelihood of being identified with autism was consistent across Utah HDs at younger ages. Study findings merit further investigation into factors leading to regional discrepancies in autism identification and ascertainment to inform HD-level autism diagnostic and service needs.



429.153 Trends in the Presentation of Children with Autism Spectrum Disorder to a Tertiary Multidisciplinary Setting in Lower Middle Income Country

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Background: The global burden of diseases suggests an increase in the prevalence and incidence of autism spectrum disorder. Studies indicate that socio-demographic factors, associations, and clinical presentations have evolved in different dimensions over the years.

Objectives: This study aims to describe and compare the sociodemographic factors, risk factors, and clinical presentation of children with autism in a tertiary multidisciplinary setting in Sri Lanka, at two time points five years apart.

Methods: We carried out a secondary data analysis of the autism database of the National Centre for Children with Disabilities in Sri Lanka and compared data sets in 2017 and 2022. Any child (0-18 years) with a specialist-made diagnosis of autism spectrum disorder according to DSM V criteria was included in the analysis. SPSS 28.0 software was used for the analysis of data.

Results:

In 2017, 54 children with autism presented to the centre compared to 326 in 2022. The male-to-female ratio was 13:1 in 2017 while it was 3.2:1 in 2022. The mean age at presentation was not significantly different in the two-time points. In 2017, the average age at presentation was 54.83 months (SD 35.19, median 45.5 months), compared to 53.05 months (SD 32.67, median 44 months) in 2022. Only 48.3% presented before 48 months in 2017 and 62% did so in 2022 ($p < 0.001$). Most of the children with autism were firstborns.

Perinatal risk factors were observed at higher percentages in 2017 compared to 2022.

	2017	2022	p
Antenatal risk factors (diabetes, hypertension)	10 (17.9%)	15 (4.6%)	<0.001
Neonatal sepsis	3 (5.4%)	11 (3.4%)	0.405
Neonatal jaundice	14 (25%)	40 (12.3%)	0.028
Low birth weight	6 (10.7%)	23 (7.1%)	0.348
Prematurity	3 (5.4%)	17 (5.2%)	0.505

A higher percentage had co-morbid epilepsy 6/56 (10.7%) and attention deficit hyperactivity disorder (ADHD) 4/56 (7.1%) in 2017 in comparison to 10/326 (3.1%) and 7/326 (2.1%) respectively in 2022 ($p < 0.05$).

Conclusions: The number of children presented with autism was six times higher in 2022 compared to 2017. This may reflect the increasing numbers as well as the better establishment of the centre in the National system, allowing more patients to come. The number of females with the diagnosis has gone up fourfold within five years. These findings are compatible with the secular trends globally.

There was no significant difference in the mean age of presentation to the services, but more than half of the population in 2022 presented before 48 months. The presence of demonstrable perinatal risk factors was higher in 2017 than in 2022, raising important questions about epigenetics.

Particularly, neonatal jaundice and antenatal risk factors were present in significantly higher percentages in 2017. Associated comorbid conditions were observed more frequently in 2017 compared to 2022.

We recommend larger population-based studies to understand trends in underlying socio-ecological, aetiological factors, and clinical presentations of children with autism.

429.154 Trends in the Prevalence of Autism By Adaptive Level between 2000-2016: Evidence from a Population-Based Sample of 8-Year-Old Children in the United States

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Background: As the prevalence of autism has increased in recent decades and continues to rise, and as identification strategies have improved, the heterogeneity of the autistic population has also grown. A challenge in autism policy and research is how to accurately and adequately describe variability in functioning, disability, and support needs in this population. The Center for Disease Control and Prevention's Autism and Developmental Disabilities Monitoring (ADDM) Network provides biennial estimates of autism prevalence and the percentage with IQ ≤ 70 based on information in children's health and education records. Adaptive test scores, which can also be found in health and particularly education records, may provide better insights than IQ scores do into functional variation in the autistic population.

Objectives: Describe: (1) the availability of adaptive scores in health and education records from a multisite autism surveillance network; and (2) trends in autism prevalence by adaptive level between 2000 and 2016.

Methods: The ADDM Network is a multisite surveillance system that monitors the prevalence of autism in children in the United States; we limited our analysis to 8-year-old children from study years 2000-2016. Abstracted health and educational records were reviewed by clinicians to determine autism case status based on Diagnostic and Statistical Manual of Fourth Edition-Text Revision (2000-2016) and Fifth Edition (2016) criteria. Adaptive behavior was measured using Vineland Adaptive Behavior Scales scores from tests administered between the ages of six to eight years (VABS 6-8yrs). We used multiple imputation to account for missing adaptive scores and estimated population prevalence with 95% confidence intervals (CI) stratified by adaptive impairment level (moderate to profound impairment [VABS 6-8yrs score ≤ 50], mild [51-70], borderline [71-85], and none [>85]) using population census denominators.

Results: Overall, 16,164 (65.5%) children had adaptive test results recorded, with scores for the remaining 8,505 estimated using multiple imputation. Availability of scores differed by child and sociodemographic characteristics. In 2000, the prevalence of autism was highest in those with mild adaptive impairment (3.1 per 1,000 8-year-old children [95% CI: 2.7-3.4]), followed by those with borderline (1.4 [1.2-1.7]), moderate to profound (1.5 [1.2-1.7]), and those with no adaptive impairment (0.6 [0.4-0.8]). Over time, prevalence rose only for autism with mild to no adaptive impairments. In 2016, the prevalence of autism with moderate to profound adaptive impairment (1.2 [1.1-1.4]) was similar to that in 2000; for every other adaptive level, the prevalence had increased substantially. The largest increase was observed among children with no adaptive impairment (3.4 [3.2-3.7], a 464% increase), followed by borderline (6.9 [6.5-7.2], a 382% increase), and mild impairment (7.3 [7.0-7.7], a 139% increase).

Conclusions: Using adaptive scores available in health and education records, we estimated the population-based prevalence of autism by adaptive level. The increase in autism prevalence between 2000 and 2016 among children with mild, borderline, or no adaptive limitations could indicate improved identification of those with milder limitations as well as increased access to effective therapies. This study demonstrates the feasibility and value of incorporating adaptive behavior scores into epidemiologic studies and public health surveillance of autism.



Poster Session**430 - Interventions - Social, Cognitive, Behavioral and Educational – Preschool & Infant II**

May 2nd, 2025, 6:00 PM - 7:00 PM - Hall 4A

430.156 Factors Related to Parents' Frequency of Practice in the Part C Early Intervention System

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Background: Studies have shown that parent engagement in their child's intervention leads to better child outcomes; this is especially true for parent-mediated interventions, in which parents are expected to practice strategies between sessions in order to help their child generalize communication skills to their home. A number of demographic and psychological factors (Gopalan et al., 2010; King et al., 2014; Pereira & Barros, 2019) have been identified as predictors of caregiver engagement in general child psychotherapy, but much less is known about factors that influence caregiver engagement in Part C Early Intervention (EI) system for children with early signs of autism.

Objectives: The current study aims to examine how family demographics, parent self-efficacy, and parent motivation influence parent engagement as measured by caregiver-reported between-session practice, in the Part C (EI) system.

Methods: Parents of young children with social communication delays ($n=106$) were recruited from an ongoing randomized controlled trial examining the effectiveness of a parent-mediated intervention in the Part C EI system. Parents completed a family demographics questionnaire, the Parenting Efficacy Scale (PES), and the Readiness to Change Subscale of the Parent Motivation Inventory (PMI) at intake. Parents participated in weekly EI sessions with their child for four months of active study participation. Once a month, parents reported on their frequency of practice of content learned in EI sessions, which was averaged to yield a mean parent-reported practice score. Multiple regression was used to examine whether parent characteristics at intake predicted frequency of practice.

Results: Parent motivation, parent age, and number of children in the household explained a significant amount of variance of frequency of practice ($F(4, 102) = 6.158, R^2 = .195, R^2_{adjusted} = .163, p < .001$). Specifically, higher motivation ($t(102) = 3.19, b = .041, p < .001$), younger parent age ($t(102) = -2.48, b = -.003, p < .05$), and a lower number of children in the household ($t(102) = -2.14, b = -.23, p < .05$) significantly predicted higher frequency of practice. Parent self-efficacy was not a significant predictor ($t(102) = 1.1, b = .026, p = .27$). Additionally, neither parent age nor number of children in the household significantly moderated the influence of parent motivation on frequency of practice.

Conclusions: Preliminary findings suggest that highly motivated parents report greater frequency of practice between EI sessions, and older parents and parents with multiple children face greater barriers to at-home practice. Providers may need to provide additional support for older parents and those with multiple children in their household. Further, providers should consider incorporating motivational strategies such as motivational interviewing to promote parent practice between sessions.

430.157 Feasibility and Acceptability of Telehealth Intervention with Caregivers and Younger Siblings of Children with Autism

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Background:

There is growing research on telehealth interventions for autistic children with few focused on the younger biological siblings of autistic siblings (sib-aut). Providing Project ImPACT via telehealth (tele-ImPACT) is as effective as in-person for improving child language skills and parent implementation of the strategies (Hao et. al 2020). However, participation in parent-mediated tele-health intervention is inconsistent. According to Ingersoll et. al (2017), only 28.5% of caregivers of autistic children enrolled in an ImPACT online intervention program after their child's referral and diagnosis. Additionally, in Bradshaw et al. (2020), 44% of caregivers with a sib-aut child, declined to enroll in a parent-mediated telehealth intervention study. Therefore, it is important to investigate how telehealth intervention impacts the caregiver perspective and how telehealth implementation is perceived for younger populations such as sib-aut. The purpose of this study is to understand the feasibility and acceptability of tele-ImPACT for caregivers and their sib-aut children.

Objectives:

- (1) Is it feasible to conduct intervention with caregivers and their sib-aut children via telehealth?
- (2) Are the telehealth intervention procedures, as designed, acceptable to families?
- (3) Can therapists provide telehealth intervention to caregivers with high rates of fidelity?

Methods:

32 primary caregivers (30 mothers; 1 father; 1 grandmother), from an ongoing clinical trial, who had a sib-aut infant toddler (11-18 months of age), were selected to participate in a telehealth intervention. Caregivers were predominantly White (34.4%) and Hispanic/Latino (18.8%), with 11 stay-at home parents and 17 being full-time employed. Their average household size was 4.88, and household income varied, with 28.1% receiving government assistance.

Randomly selected intervention dosages ranged from 11-24 sessions, with some caregivers receiving 1-hour sessions twice a week for 6-8 weeks with or without weekly 30-minute booster phone calls, and/or 1.5-hour sessions twice a week with video feedback for 6-8 weeks. Interventionists rated therapist fidelity of sessions that were not their own by rating the therapist's preparation, strategy demonstration, coaching/feedback, reflection and planning, and overall coaching quality. Post-intervention, caregivers completed surveys regarding their satisfaction with the intervention, telehealth-specific procedures, and their parent-therapist alliance (adapted from Wheat, 2017).

Results:

21 out of 32 primary caregivers completed their intervention dosages during the ongoing clinical trial, with 3 caregivers declining participation in intervention sessions after selected. Incomplete intervention dosages were due to caregiver scheduling conflicts, personal family matters, or internet connection issues. Caregivers' number of completed sessions ranged from 1 to 24. Most caregivers' telehealth intervention experiences and parent-therapist alliances were positive. However, some caregivers cited the substantial time commitment as a barrier to participation. Regarding the therapist intervention fidelity, 74 out of 420 sessions were rated, with 92.53% fidelity ($SD = 5.11$), and with high reliability.

Conclusions:

It is recommended to offer telehealth intervention with caregivers who have a child who is a sib-aut with specific telehealth dosages that are adapted to meet each families' needs. Although parent-therapist alliance may align and therapists may have high intervention fidelity, it is important to have intervention program flexibility to provide feasible and acceptable telehealth intervention for families.

430.158 Feasibility of a Pre-Emptive Parent Mediated Intervention for Infants with Prodromes of Autism Spectrum Disorder (ASD) during the First Year of Life within an Italian Community

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Background: ASD prodromes emerge during the first year of life, a time when brain plasticity is at its maximum level. Pre-emptive Intervention for infants with ASD prodromes seems more efficacious in supporting development and diminishing symptomatology in comparison to starting treatment later in life. Despite this evidence, professionals tend to have a 'wait and see' approach, rather than targeting areas of impairment with early intervention. Currently, the clinical model of ASD in Italy requires a diagnosis to receive services, while the identification of ASD prodromes generally is not sufficient to access early intervention, thereby missing the developmental window of maximum brain plasticity.

Objectives: This study aims to evaluate feasibility and exploratory efficacy of FIRRST (Fostering Infant Responsivity and Reciprocity – Support to Thrive), a parent mediated pre-emptive intervention based on the Infant Start in symptomatic infants under 15 months of age.

Methods: To date, 32 infants (M/F = 21/11; age: M [SD] = 10.78 [2.97], range = 7–14 months) have been enrolled into the program after meeting at risk criteria on two subsequent administrations of the SACS-R. The parent mediated intervention consists in 1-hour weekly sessions for a period of 6 months delivered through tele-health. Assessments are conducted prior the beginning of intervention (T0), after 3 months from the start of the intervention, and after 6 months from the start of the intervention (T2). Assessments include measures of ASD symptoms, developmental levels, parent fidelity, and parent-child interaction. The analysis of the differences between time points is performed using a repeated measures ANOVA.

Results: In terms of feasibility, all families enrolled attended at least 80% of sessions and only 1 family dropped out of the program. Parents obtained at least 80% of fidelity in intervention implementation and significantly improved in their interaction strategies (MONSI-CC Total score $F=19.94$; $p=0.001$). Preliminary results on the 10 children who have concluded the program show significant improvements in the social-communication domain, both during interaction with parents (BOSCC Total score $F=49.69$; $p=0.001$) and at developmental assessment (Griffiths III Language and Communication DQ $F=13.46$; $p=0.006$; Personal-Social-Emotional DQ $F=20.07$; $p=0.002$). Both Griffiths General Quotient scores and Vineland II Adaptive Behavior Composite Scores show a significant improvement in children's overall development and adaptive functioning (respectively $F=9.66$; $p=0.01$ and $F=6.69$; $p=0.03$).

Conclusions: Our preliminary findings support feasibility of a parent mediated pre-emptive intervention as demonstrated by access to the program and 97% retention. Significant improvement in socio-communication skills and developmental levels suggest that our program may be successful in improving outcomes of individuals with ASD prodromes within the Italian Health System. After this encouraging pilot phase, FIRRST will be evaluated through a funded multisite RCT.

430.159 Improving Child Social Engagement through Early Autism Intervention: Results from the Pivotal Response Treatment App-Based Clinical Trial

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Background: High levels of early child engagement are associated with a host of favorable developmental and cognitive outcomes (Bakeman & Brown, 1980; Kawamichi et al, 2016). Naturalistic Developmental Behavioral Interventions (NDBI) are a contemporary class of early autism intervention models designed to use child interests, natural routines, and shared control to engage young autistic children and promote engagement in the form of social communicative initiations and responses. These therapeutic targets are crucial, as limited engagement is a recognized core vulnerability of autism that have downstream implications for social engagement, relationships, and learning (Watkins et al., 2015). Motivation-based NDBI models such as Pivotal Response Treatment use child selected and preferred activities as a means to increase attention to social partners and increase the likelihood that a child will engage (Verschuur et al, 2014). The current study targeted parent intervention skills in the context of a self-directed app-based training program called Pivotal.

Objectives: To evaluate improvements in child social engagement spanning a range of verbal and nonverbal social behaviors (verbal initiations, verbal responses, eye contact, direct facial expression during parent-child intervention sessions between pre- and post-program 5-minute intervention probes.

Methods: Participants included 34 parent-child dyads recruited nationwide and randomized to two versions of the Pivotal app. For this study, they were analyzed as a single cohort. Child participants (12 to 56 months) have an existing diagnosis of ASD and a language delay. Parents complete intake and follow-up assessments, eight PRT lessons, and record and review parent-child videos in-app after each lesson, which are then reviewed by the research team for analysis. Research assistants, masked to study condition, coded each parent-child video submissions (5-minute videos) for the presence of intervention components and child behaviors. Child responsiveness was defined as a percent of parent-initiated PRT antecedent bids that were immediately followed by an appropriate child verbal response.

Results: Using a series of paired-samples T-test, the entire project cohort of children with autism significantly improved in their number of social initiations ($M_{pre} = 8.0$ [$SD = 10.7$], $M_{post} = 15.1$ [13.0], $p = .007$, Cohen's $d = 1.16$), and responses to social bids ($M_{pre} = 7.53$, $M_{post} = 12.91$, $p = .005$, Cohen's $d = 1.26$). Behavioral coding and analysis of nonverbal social behaviors (eye contact and directed facial expressions) is ongoing and will be complete by February 2025, with preliminary outcomes indicative of clinically meaningful improvements. Overall, these improvements to child social engagement were not simply due to increases in the number of parent-initiated social communication bids, which did not significantly differ between intake and program completion ($p = .152$), suggesting that the quality (rather than quantity) of parent bids drove increases in child responsiveness as parents learned the intervention strategies.

Conclusions: Parents who participated in this app-based clinical trial appear to have learned effective strategies for engaging their child in intervention efforts. Motivation-based early intervention efforts that increase child responsiveness may have a significant impact on child developmental outcomes.

430.160 Improving Parent Early Intervention Mastery: App-Based Training & Fidelity Self-Scoring in Pivotal Response Treatment

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Background: Self-directed autism intervention parent training models have the advantage of not requiring professional service providers and thus have significant potential for scalability and mass dissemination. Unfortunately, the lack of in-person training and personalized feedback means that outcomes associated with self-directed models are inferior to professionally-led training efforts (Ingersoll et al., 2016). In order to improve self-directed learning outcomes, we examined the potential benefits of including an interactive fidelity self-scoring feature within an app-based training program for the Pivotal Response Treatment (PRT) early autism model, which is a well-established Naturalistic Developmental Behavioral Intervention (Minjarez, Bruinsma, Stahmer, 2020)

Objectives: To examine the additive benefit of parent self-scoring of fidelity on intervention mastery in the context of an app-based parent training RCT.

Methods: Participants included 34 parent-child dyads across the U.S. (randomized to either the self-scoring PRT app and a non-self-scoring version of PRT app). Child participants (1 - 4.5 years) had an diagnosis of autism and delayed language development. Parents completed intake and follow-up assessments, eight PRT lessons, and recorded 5-min parent-child PRT videos every two lessons. Families in the self-scoring condition completed an in-app review of their videos by pausing after each trial and answering questions about strategy use in order to receive automated feedback on scored results. Research assistants, masked to the treatment condition and video sequence, also scored videos for multiple measures of PRT fidelity, including (1) mean percentage of PRT component use, (2) percent of trials with *all* PRT components (a more stringent measure of fidelity), and (3) number of PRT ABC trials per video.

Results: A series of mixed Group x Time ANOVAs revealed superior outcomes associated with parents randomly assigned to the fidelity self-scoring app condition.

For Mean PRT fidelity, there was a significant interaction between the app condition and time on mean fidelity percentage, $F(1,32) = 12.86$, $p < .0005$, partial $\eta^2 = .218$. Participants in the self-scoring condition demonstrated evidence of increased mastery post-trial (mean 79.25%; SD 15.24%) when compared to the non-scoring condition (mean 72.75%; SD 15.23%). Results are depicted in Figure 1. For Trials with All PRT components, there was also a significant interaction between the app condition and time, $F(1,32) = 6.06$, $p = .018$, partial $\eta^2 = .116$. Participants in the self-scoring condition demonstrated increased use of all components post-trial (mean 51.33%; SD 32.47%) versus the non-scoring condition (mean 41.67%; SD 27.86%). Results are depicted in Figure 2.

For Number of PRT ABC Trials, there was *not* a significant group x time interaction, with a comparable number of ABC trials post-trial across self-scoring (mean 3.92; SD 3.96) and non-scoring (mean 6.5; SD 7.85) conditions.

Conclusions: Parents randomly assigned to the self-scoring PRT condition experienced moderately superior gains in fidelity mastery when compared to those in the non-scoring condition. Such findings suggest that self-analysis of intervention delivery may hold promise as a means to bolster self-directed training efforts and enhance parent fidelity mastery and corresponding child outcomes in self-directed mass dissemination efforts.



430.161 Inclusive Community Music Program for Autistic and Neurotypical Children and Their Families

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Background: In conversations with local children's museums, we learned that young autistic children did not typically attend museum offerings. Although the reasons have not been investigated, the staff considered that the lack of tailoring for autistic children's needs was at the root of the problem. Interventions that use music to support development (i.e., music-mediated interventions) and parent-mediated interventions are currently considered evidence-based practices for autistic youth (Steinbrenner et al., 2020; Hernandez-Ruiz & Braden, 2021). By creating a program tailored to these children's needs and strengths, based on music therapy practices, we created an inclusive early music program to encourage participation from autistic children and their families.

Objectives: This study explored parental perceptions of usefulness, acceptability, and satisfaction of the program.

Methods: The community music program entailed six weekly 30-min music sessions. The music sessions combined active music making, movement, and visual supports for motor, social, cognitive and language learning. Participants included eleven children (aged 1 to 5) and nine parents (N = 20). Parents were active participants who learned the music strategies to implement at home. To avoid bias from all parties, we confirmed autism diagnosis only at the end of the program (n=2). A play area outside the session room provided a safe space for children who needed a sensory break. Parental perspectives were captured by a faculty member and doctoral students from another department through focus groups after each music session, and an exit *ad hoc* survey. The survey asked about parents' (1) perception of the usefulness of the content; (2) confidence in their ability to use what they learned; (3) satisfaction around music therapy students' interest and concern for their family; (4) feeling respected; and (5) potential recommendation of the program.

Results: Eight of the nine families completed the final satisfaction survey. All participants felt that their family and themselves were respected (i.e., *strongly agreed*, score of 5, n = 8, 100%), and all would *definitely* recommend the program to others (score of 5, n = 8, 100%). Participants felt *satisfied* (score of 4, n = 1, 12.5%) or *very satisfied* (score of 5, n = 7, 87.5%) with the program overall. They also felt *satisfied* (score of 4, n = 1, 12.5%) or *very satisfied* (score of 5, n = 7, 87.5%) with graduate students' interest and concern for them and their goals. Participants considered the program *useful* (score of 4, n = 4, 50%) or *very useful* (score of 5, n = 4, 50%). Similarly, participants felt *moderately confident* (score of 3, n = 1, 12.5%), *confident* (score of 4, n = 2, 25%) or *very confident* (score of 5, n = 4, 62.5%) in their ability to use what they learned at home. Qualitative results were consistent with the survey, highlighting parents' requests for more programming.

Conclusions: Inclusive community music programs based on evidence-based music therapy strategies seem acceptable and highly regarded by parents of autistic and neurotypical children. Music-mediated intervention principles are recommended to encourage participation from the autistic community.

430.162 Incredible Years® (IY-ASLD): Pilot Study Examining Effects on Parent-Child Dyads' Proportion of Time in High and Low Joint Engagement

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Background: The Incredible Years® Autism Spectrum and Language Delays (IY-ASLD) program is an empirically supported psychoeducational intervention developed to address the specific needs of raising children with autism (Webster-Stratton, Dababnah, Olson, 2018). The program emphasizes work on sensory routines through joint attention and communication skills (Webster-Stratton et al., 2018) through strategies likely to sustain social interactions and communication and, thus, joint engagement (JE), a state of prolonged shared interest between two people. Children's sustained experiences in JE states are linked to later expressive language outcomes (Adamson et al., 2019). JE is facilitated in IY-ASLD through strategies where the parent gets into their child's "attention spotlight." We hypothesized that by emphasizing these strategies, the program would lead to the dyad spending more time in higher as opposed to lower states of JE from baseline to post-intervention.

Objectives: This study addresses these questions: a) is there an overall increase in the proportion of time spent in a higher versus lower form of JE, and does this differ by children's level of support needs? b) For dyads in low JE more than 50% of the time, is there a significant increase in time spent in high JE from baseline to post-intervention? c) do dyads already in high JE at baseline maintain this from baseline to post-intervention?

Methods: Data from a waitlist-controlled RCT of N = 58 dyads will be reported. Preliminary analyses are from a pilot study of N=17 mother-child dyads (ages 2-5 years) whose children had a diagnosis of ASD or language delay. The intervention included 12 weekly telehealth sessions lasting 90 minutes. Joint engagement was measured using an adaptation of the Communication Play Protocol (Adamson, 2004), consistent with Kasari et al., 2010. High and low-supported engagement were coded using definitions from previous work on parent-mediated joint engagement interventions (Bottema-Beutel et al., 2014). The 12-minute parent-child interaction was recorded on Zoom at baseline and post-intervention. Children's support needs level was measured using Vineland Adaptive Behavior Scale-3, Teachers Report Form Composite score (below a standard score of 70 vs. a score of 70 and higher).

Results: Pilot data revealed that children with relatively higher adaptive behavior scores spent a greater proportion of time in high JE than low JE at baseline, and this remained the case post-intervention. Children with low adaptive behavior spent time in both low and high JE, and this did not change over the course of intervention. Findings from the waitlist-controlled RCT will be reported.

Conclusions: Our results show that even in a sample of children with low adaptive behavior overall, higher adaptive behavior was associated with a high average proportion of time in high JE and low adaptive behavior with low levels of high JE. Neither group changed significantly from baseline to post-treatment. This was unsurprising in the high adaptive behavior group as they were near the ceiling on the high JE measure. However, the low adaptive behavior group had considerable room for improvement, but the intervention did not change levels of high JE.

**430.163** International Deployment of Evidence-Based Intervention: Jasper in Family Support Centers

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Background: Implementation of evidence-based interventions are a critical tool in supporting the development of autistic children. Joint Attention, Symbolic Play, Engagement, and Regulation (JASPER) is an evidence-based intervention with extensive support in research settings. Recently, its efficacy has been proven shown in community-based preschool contexts (Chang et al., 2016). However, differences in population characteristics, practice context, and treatment fidelity (Weisz, 2004) highlight the need to further examine the deployment of evidence-based interventions by community partners across various contexts.

Objectives: The current study examines the outcomes of a community-based implementation of JASPER in a preschool setting, through the deployment of trained, international partners that received a hybrid of in-person and virtual support.

Methods: Specialists in the family support centers participated in a five-day in-person seminar, followed by monthly virtual meetings until they achieved JASPER fidelity. A total of 15 specialists achieved fidelity. In the current study we analyze treatment outcomes for 70 child participants from a network of family support centers across 4 cities in Russia, including Moscow, Nizhny Novgorod, Saint-Petersburg, and Tula. Included students were between 1.5 – 6 years old with a confirmed diagnosis of autism. JASPER was provided two times a week for one hour across the program duration of 3 - 6 months. Specialists administered the Short Play and Communicative Evaluation (SPACE, Shire et al., 2013), which provides scores on joint engagement, joint attention skill, expressive language ability, and play skills. The SPACE was administered when children entered the JASPER program, and again, after completion. Change scores in joint engagement, joint attention skills, expressive language ability, and play skills were calculated and analyzed using Wilcoxon signed-rank tests to compare scores before and after completing the JASPER program.

Results: Wilcoxon signed-rank tests showed significant improvements in joint engagement ($V = 11.5$, $p < 0.001$), joint attention ($V = 78$, $p < 0.001$), play skills ($V = 19.5$, $p < 0.001$), and expressive language ability ($V = 16$, $p < 0.001$) after completing the JASPER program.

Conclusions: This study scales community-based deployment of evidence-based interventions in a preschool setting, across an international context. Trained, international community partners can effectively implement JASPER to target significant improvements in core deficits developmental behaviors in autistic children. A hybrid training model, that included initial in-person support and regular virtual follow up support, effectively trained specialists to provide JASPER at high fidelity. Furthermore, follow up observations show that specialists maintain fidelity after virtual support is ended ($M = 95\%$). Future studies should continue to examine evidence-based interventions in consideration with various community contexts.

430.164 Investigating the Impact of Internalizing Symptoms on the Efficacy of Pivotal Response Treatment

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Background:

Autistic children have elevated rates of internalizing problems, such as depression and anxiety (DeFilippis, 2018). Pivotal Response Treatment (PRT) is an evidence-based behavioral intervention for children with ASD focused on improvement in the social communication domain.

Objectives:

This study aimed to examine whether internalizing symptoms commonly comorbid with ASD (anxiety, depression, and emotional dysregulation) significantly impact the efficacy of PRT, particularly its ability to improve outcomes in social communication.

Methods:

This study included 58 autistic participants between the ages of 4 and 9 years old. Diagnosis was confirmed by the ADOS. Social communication skills were assessed using the SRS-2, anxiety and depression were measured using the CBCL, and emotional regulation was measured by subdomains of the BRIEF-2. Each participant participated in 16 weeks of PRT for 6 hours weekly. Each assessment was administered at baseline and at the end of treatment.

Results:

Participants made significant progress in social communication skills following a trial of PRT, as measured by the SRS-2 Total Raw Score ($t = 3.087$; $p = .002$). Additionally, there was a relationship observed between overall social communication functioning and baseline emotional regulation, as measured by BRIEF-2, at both baseline (Inhibit ($r = .448$; $p = .002$), Shift ($r = .608$; $p < .001$), Emotional Control ($r = .535$; $p < .001$)) and end of treatment (Inhibit ($r = .425$; $p = .005$), Shift ($r = .654$; $p < .001$), Emotional Control ($r = .575$; $p < .001$)). There was not, however, a significant correlation between magnitude of change in social communication skills and emotion regulation, as measured by Inhibit ($r = -.072$; $p = .647$), Shift ($r = -.043$; $p = .782$), and Emotional Control ($r = -.026$; $p = .867$) of the BRIEF-2.

Similarly, when groups were divided by baseline level of internalizing symptoms (T-Score above/below 60), CBCL Anxiety/Depression ($F(1,46) = 14.301$; $p < .001$), Internalizing Problems ($F(1,46) = 25.072$; $p < .001$), and Anxiety Problems ($F(1,46) = 15.544$; $p < .001$) subscale scores were significantly related to the participants' end of treatment raw SRS-2 scores. However, these same measures were not significantly related to the magnitude of change between baseline and end of treatment SRS-2 scores (Anxiety/Depression ($F(1,46) = 1.321$; $p = .256$), Internalizing Problems ($F(1,46) = 729$; $p = .398$), Anxiety Problems ($F(1,46) = .913$; $p = .344$)).

Conclusions:

Participants evidenced significant improvements in social communication skills following a trial of PRT, supporting the efficacy of the intervention. Additionally, children with higher levels of emotional dyscontrol and internalizing symptoms had more impaired social communication skills at both baseline and end of treatment. However, these comorbid symptoms did not have an effect on the magnitude of change in social communication skills following a trial of PRT. Therefore, PRT can be an effective treatment approach for children with ASD with and without comorbid emotional dyscontrol and internalizing symptoms.

430.165 Mechanisms of Change in Language and Cognition By Early Intervention

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Background: Treatment mechanisms of therapist-mediated interventions have rarely been studied. Joint attention and fine-motor skills as well as executive functions have been described as early developmental skills longitudinally related to language and cognitive development in children with Autism-Spectrum-Disorder (ASD). Thus, we studied these skills as possible mediating mechanisms of change in language and cognition through 12 months early intervention.

Objectives:

- 1) Do children who show an improvement in joint attention, fine-motor and executive function skills also show a better outcome in language and cognition after 12 months?
- 2) Is the improved outcome influenced by a particular type of intervention?

Hypotheses:

First, we expected to find a positive correlation between 12-months gain in language and cognition and the time course of improvements in joint attention, fine-motor and executive function skills during intervention. Second, we expected that the Frankfurt early intervention program A-FFIP will induce earlier and larger changes in joint attention, fine-motor and executive function skills than early intervention as usual (EIAU).

Methods:

Data were collected as part of the confirmatory phase-III, prospective, randomised, controlled, parallel-group A-FFIP study with two treatment arms, an allocation ratio of 1:1 and six measurement points every 3 months over 12 months. Mediation analyses of the child's joint attention, fine-motor skills and executive function on changes in language and cognition were conducted by using Latent Change Score Models (LSCM). Most mediators and outcomes were assessed by blinded testers and raters. Responsive joint attention was taken from the Early Social Communication Scales, fine-motor skills were assessed by the Bayley-III scales, language and cognition were taken either from Bayley-III or WPPSI developmental and cognitive tests. Executive function was assessed by the parent rated BRIEF-P.

Results:

A total of 134 children were included (A-FFIP: n=68, EIAU: n=66), mean age was 49 (SD 10) months, mean developmental age 23.3 (SD 13.6) months, and 26 (19.4%) were female; 43 (66.2%) of families in the A-FFIP group and 37 (58.7%) in the EIAU group had at least one parent who had immigrated to Germany as an adult. Higher changes in responsive joint attention and fine-motor skills were associated with higher changes in cognition (0.18/1.17) and language (0.14/0.64). No differential effects of A-FFIP versus EIAU were observed. There was no association between change in executive function and change in cognition or language over one year. Across models, A-FFIP was associated with positive changes in language compared to EIAU (~ 0.15 - 0.18).

Conclusions:

Children who showed improvements in responsive joint attention and fine-motor skills also showed improvements in cognition and language, independent of intervention. These results replicate previous findings from longitudinal studies showing a positive correlation between joint attention, fine-motor skills and language and cognition. As the longitudinal positive correlation did not differ between A-FFIP and EIAU, it remains an open question, if joint attention and fine-motor skills may be mediators of intervention effects, or independent longitudinal predictors of language and cognitive development in toddlers and preschool aged children with ASD.

430.166 Multivariate Insights into Child Engagement and Behavioral Fluctuations in Early and Intensive Autism Intervention: Implications for Outcomes

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Background:

Strong evidence supports the efficacy of prompt, intensive behavioral interventions in improving outcomes for individuals with ASD (Dawson et al., 2010; Reichow, 2012; Daniolou et al., 2022). Research indicates that early and intensive interventions focusing on social skills can significantly reduce autistic symptoms and provide substantial cognitive benefits (Dawson et al., 2010; Klintwall et al., 2015). These interventions present a transformative opportunity for children who might otherwise face intellectual challenges. Early detection and tailored interventions during the critical period of cerebral plasticity are crucial (Dawson, 2008). While gains are most significant when intervention begins before 24 months (Lombardo et al., 2021), variability in outcomes highlights the need to identify predictive features influencing intervention success.

Objectives: The objective of this study was to identify early indicators that could be informative of the intervention outcomes in young children with ASD based on the observations during early intervention sessions.

Methods:

We analyzed a unique dataset of psychologist reports from an intensive early intervention program (Early Start Denver Model). Weekly intervention sessions were filmed, and psychologists assessed each child's overall state (e.g., fatigue, irritability, engagement), session quality, and symptoms (such as communicative attempts, sensory behaviors, mannerisms). Data were collected from 42 children (10F, aged 2.49 ± 0.68), each with an additional assessment after 12 months. Progress was measured using a symmetrized percentage of change (SPC). A k-means cluster analysis based on baseline DQ and SPC identified three groups: Minimal Responders, Optimal Responders, and Higher Cognitive, consistent with our previous findings (Godel et al., 2022). Children with higher initial cognitive and social competence showed greater improvements, while those with lower scores at baseline divided into two subgroups—optimal responders with substantial progress, and minimal responders facing persistent challenges. We further employed a PLS-C approach to explore multivariate relationships between the psychologists reports and key design variables (outcome group and age).

Results:

The PLS-C analysis yielded one significant component ($P = 0.001$), reflecting an effect of group and age. The behavioral patterns observed in older children at intake who showed an optimal response to intervention included higher engagement, a better general state, and greater communication skills (Figure 1). By the end of the second month, sensory behaviors emerged as a significant negative factor impacting learning readiness and social engagement.

Conclusions:

This unique, densely sampled assessment of intervention progress in young children with ASD demonstrates how initial assessments relate to subsequent developmental trajectories. A key finding, beyond the initial level of communicative skills, is the importance of the child's general state and engagement, as well as the negative impact of sensory behaviors on learning readiness and social engagement.

Closely monitoring the child's state and behavioral fluctuations throughout intervention is essential for understanding factors driving heterogeneous outcomes, even with standardized intervention. These insights can pave the way toward more personalized approaches, enabling tailored support that addresses each child's unique profile and maximizes their potential. By embracing a personalized approach, practitioners can refine interventions to better align with each child's evolving needs, optimizing immediate and long-term developmental outcomes in children with ASD.



430.167 Outcomes of a Group-Based Social-Emotional Skills Intervention Incorporating the Ndbi Approach for Preschool Children with High-Functioning Autism Spectrum Disorder in Taiwan: Preliminary Findings

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Background: A core symptom of autism spectrum disorder (ASD) is a persistent deficit in social communication and interaction. This deficit constitutes a significant source of impairment for individuals, regardless of their cognitive function or language ability. Early social skills intervention, starting from preschool, can enhance future social adaptation outcomes among children with ASD. Recently, several studies suggest that Naturalistic Developmental Behavioral Intervention (NDBI) is an important trend in early intervention for children with ASD. However there is currently limited published research on using the NDBI approach in group intervention for preschool children in Taiwan.

Objectives: This study aims to develop a group-based intervention adopting NDBI approach to enhance social-emotional skills and to examine its effects on preschool-age children with high-functioning ASD.

Methods: Eight children diagnosed with high-functioning ASD (average age = 4.6 years; average FSIQ = 94.4, VCI = 90.9), according to DSM-5 criteria and the Autism Diagnostic Observation Schedule, Second Edition (ADOS-2), were recruited. The group-based intervention focused on improving social-emotional skills, including appropriate verbal and nonverbal social initiations and responses, emotion recognition, and emotion regulation through various play activities, including stacking blocks, card games, and ball games.

Key features of NDBI were implemented in group-based intervention. These included providing learning opportunities for all targeted social-emotional skills within each play activity, and allowing each child to independently choose and express preferred reinforcers to enhance children's participation in each session. Additionally, prompts were given based on individual performance levels, incorporating various levels of instruction such as modeling, verbal or visual cues, and natural responses from two group leaders, which consisted of a licensed clinical psychologist and a clinical psychology graduate student.

Each intervention group was designed to include four children to ensure sufficient engagement and interaction opportunities for each child. The intervention involved one hour per week over eight weeks. Pre- and post-intervention outcome measures included parent- and teacher-rated assessments, including the Chinese Social Responsiveness Scale (Chinese SRS), Child Behavior Checklist for School-Aged Children (CBCL/6-18), and the Vinland Adaptive Behavior Scale, Third Edition (VABS-3). The intervention effects were evaluated using various scores, including raw scores of the Chinese SRS, T scores for social, internalizing, and externalizing problems in the CBCL, and standard scores for communication and socialization domains in the VABS-3. Additionally, parent-rated satisfaction surveys were collected.

Results: The analysis, using Wilcoxon Signed Rank Tests, showed significant improvements in communication domain of the parent form VABS-3 (Wilcoxon $Z = -1.973$ $p = 0.049$), socialization domain of the teacher form VABS-3 (Wilcoxon $Z = -1.963$, $p = 0.050$), and social-emotional problem factor scores on parent-rated Chinese SRS (Wilcoxon $Z = -2.521$ $p = 0.012$). Parent-rated satisfaction scores averaged 4.5 on a five-point scale.

Conclusions: This study provides valuable insights into implementation of a group-based NDBI intervention for social-emotional skills in Taiwan. The findings suggest that an eight-session group-based NDBI program may positively impact communication adaptation and social/social-emotional challenges in preschool-aged children with high-functioning ASD, along with a high participant satisfaction.

430.168 Outcomes, Experiences, and Perceptions of Inclusive Early Childhood Education for Children without Disabilities: A Systematic Review

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Background: Some research supports the effectiveness of inclusive early childhood education (ECE) programs for children with autism (Jobin et al., 2023; Siller et al., 2021), involving enrollment of children with and without disabilities, and the embedding of evidence-based interventions into naturalistic settings. However, there are low rates of inclusion within usual care ECE programs, and caregivers of children with autism and other developmental disabilities report barriers to quality early care and education (Houser et al., 2014; Vanegas & Abdelrahim, 2016). The attitudes, perceptions, and experiences of children without disabilities and their families in these programs are important to informing research addressing the scalability and implementation of inclusive ECE programs for autism within community settings. However, no recent syntheses of the literature for this population are available.

Objectives: This systematic review aimed to synthesize the empirical literature on (1) outcomes of children without disabilities in inclusive ECE programs for children with autism and other disabilities, and (2) child and caregiver beliefs, attitudes, perceptions, and experiences of inclusive ECE.

Methods: A systematic review was conducted using PubMed, ERIC, and PsycINFO. Searches were limited to peer-reviewed articles reporting original empirical data and published between 1975-2024 reporting on the outcomes or child/caregiver beliefs, attitudes, perceptions, and experiences of inclusive ECE for children without disabilities. Broad search terms were utilized due to the varied nature of terms used to analyze and report upon these constructs. Forward and backward ancestral searches of key articles and related reviews were applied to increase this review's comprehensive nature. Inclusion criteria were related to source and study characteristics, population (children under 6 years old without identified disabilities), intervention/exposure, and outcomes. All abstracts were coded independently by two coders and disagreements were resolved via consensus, with all consensus decisions involving a doctoral-level researcher.

Results: The literature search yielded 1,324 articles. After removing 225 duplicates, title and abstract screening yielded 116 articles that advanced to full-text review. Some programs evaluated in the articles involved inclusive settings for children with disabilities in general, while others focused specifically on supporting autistic children. Programs were implemented in both the U.S. and internationally. The final extraction results presented in this poster will include analyses of inclusive program type, as well as reported child outcomes and child or caregiver beliefs, attitudes, perceptions, and experiences of inclusive ECE.

Conclusions: The results of the systematic review offer a synthesis of what is known regarding outcomes, experiences, and perceptions/beliefs around inclusive ECE for young children without disabilities. While there is growing evidence in support of embedding evidence-based interventions in naturalistic settings such as early care settings and preschools, there is no clear research synthesis on the impacts of these programs on all children. Improved understanding of these factors in the context of inclusive ECE programs for autism and other disabilities can provide critical information to key stakeholders (e.g., ECE leaders, policymakers, caregivers) and inform strategies to address barriers to the scalability and community implementation of inclusive programming for young children with autism, ultimately facilitating community-based delivery more broadly.

430.169 Parent Strategy Uptake in the Incredible Years® Autism Spectrum Program: A Mixed-Methods Study on Descriptive Commenting, Emotion, Social, and Persistence Coaching

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Background:

Parents of autistic children find navigating developmental delays to be challenging. Parent-focused interventions play an important role in increasing understanding and use of strategies that improve parent-child interactions. However, more research is needed to understand parents' experiences with these intervention programs and the factors that influence their usage and implementation of these strategies. The Incredible Years® Autism Spectrum and Language Delays Program (IY-ASLD), a group-based parent training intervention designed for parents of autistic children with speech and language delays (Webster-Stratton, Dababnah, Olson, 2018), has been shown to significantly improve both parent wellbeing and child behaviors (Dababnah & Parish, 2016; Williams et al., 2020; Hutchings et al., 2016). The current randomized control trial examines parents' strategy uptake and narratives during sessions. This study focuses on key strategies that are discussed early in the program which include: descriptive commenting, emotion, social, and persistence coaching. By focusing on these foundational strategies, valuable insights can be gained into how parents adopt and implement them, as these strategies form the basis for more advanced strategies introduced later.

Objectives:

This study aims to (1) assess changes in parent use of several key strategies (descriptive commenting, emotion, social, and persistence coaching) during parent-child interactions before and after participation in the IY-ASLD program and; (2) to examine parent narratives during intervention sessions about descriptive commenting, emotion, social, and persistence coaching strategy-use and implementation.

Methods:

Caregivers ($N=58$) with preschool-aged children with autism or language delays participated in the study. All children had an Individual Family Service Plan (IFSP) or an Individual Education Plan (IEP) and a verified autism or language delay diagnosis. Caregivers completed 14 weekly sessions of the IY-ASD tele-health program in a group-based setting with two trained lead interventionists. A mixed-methods approach is used, combining observations of strategies used during parent-child interaction (Table 1), and reflections during weekly intervention check-ins (Table 2).

Results:

Observations of parent behaviors during 12-min naturalistic play interactions conducted before and after intervention were coded for strategy utilization. Analysis of the pilot data of the RCT show a significant increase in *descriptive commenting* ($M = -1.71$, $SD = 3.69$) whereas the coaching strategies did not show a significant increase. Analysis of transcripts from weekly check-ins provide insights into experiences, highlighting challenges faced, and changes in interactions. During weekly check-ins of the group sessions, parents reflected on the use of intervention strategies. The topics discussed were coded to identified themes which include: *parent strategy utilization*, *parent cognition*, and *child development/parent-child outcomes* (See Table 2).

Conclusions:

IY-ASLD offers a framework for applying effective strategies. In the observational measure, descriptive commenting showed a significant increase suggesting that the intervention effectively supported this strategy. Coaching strategies did not show improvements which could indicate that observational data was the not best measure of this skill. However, qualitative data from weekly check-ins revealed that parents are still navigating the process of learning and applying coaching strategies. The results indicate the need for attention to addressing barriers of strategy use, ensuring that parents can implement strategies from the program.

**430.170** Pivotal Training App: Analyzing Specific Components Driving Improvements to Intervention Fidelity

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Background: Proper delivery of a parent-mediated Naturalistic Behavioral Intervention (NDBI) requires successful use of all key intervention components (Ingersoll & Wainer, 2013). Pivotal Response Treatment (PRT) is an NDBI that combines motivational and behavioral principles to develop social communication skills in autistic children (Verschuur et al., 2014). To determine if the parent has mastered the components of the intervention, it is important to track parent fidelity of implementation over the course of training efforts. Due to diverse parenting profiles and prior training, parents might start an intervention program with existing use of some intervention strategies. Therefore, it is important to understand these pre-intervention parent fidelity profiles to be able to efficiently target key fidelity components that parents do not already use and still need to master.

Objectives: To understand how parent profiles of fidelity implementation improve after participation of the *Pivotal* App Clinical Trial and how training efforts improve skill mastery in specific intervention domains.

Methods: Participants include 34 parent-child dyads across the U.S. who participated in an RCT for *Pivotal*, a self-directed app-based training program (randomized to either a video self-scoring PRT app version or to a standard PRT app without self-scoring functionality). Child participants (1 - 4.5 years) had a diagnosis of autism and language delays. Parents completed intake and follow-up assessments, eight PRT lessons, and recorded parent-child videos in-app after each lesson, which were then reviewed by the research team for analysis. For the purposes of this study, we analyzed all participants in a single cohort to analyze parent fidelity profiles and gains across PRT fidelity components (see Table 1) during baseline and final videos.

Results: Dependent sample T-tests were used to evaluate changes to PRT fidelity components. For Child Choice, demonstrated use at pre-intervention met fidelity and maintained without a significant change ($p = .151$, $Mpre = 87.4\%$, $Mpost = 91.4\%$). A similar trend was noted for Child Attention starting high with no significant change ($p = .204$, $Mpre = 89.4\%$, $Mpost = 85.4\%$). For Clear Learning Opportunity there was a significant improvement after use of the app ($p < .001$, $Mpre = 57.2\%$, $Mpost = 81.9\%$, $d = .84$). Similarly, for Contingent Reinforcement there was a significant improvement ($p = .009$, $Mpre = 32.0\%$, $Mpost = 56.8\%$, $d = .58$). Finally, for Natural Reinforcement, there was also a significant improvement ($p = .026$, $Mpre = 43.9\%$, $Mpost = 65.2\%$, $d = .54$).

Conclusions: The *Pivotal* app was linked to promising improvements on multiple PRT fidelity components. Parents already demonstrated a high degree of Child Choice and Child Attention during baseline videos, suggesting that many parents intuitively attended and engaged with their children. The use of Clear Opportunities, Contingent Reinforcement, and use of Natural Reinforcement all improved significantly and appeared to drive global improvements of overall fidelity scores. These data suggest that training programs may need to spend more time analyzing initial parent strengths related to intervention delivery and focus on specific unmastered components. Such knowledge would have implications for the development of parent and professional training models that can reallocate the focus towards these components.



430.171 Preliminary Analysis of a Four-Year Follow-up Study on the Implementation of a Short-Term, Low-Intensity Early Start Denver Model Program for Autistic Children in Taiwan: Parental Outcomes

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Background: Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder characterized by deficits in social communication and interaction, along with restricted and repetitive behaviors or interests. Children's autism symptoms can increase parenting stress and negatively affect caregivers' parental self-efficacy and quality of life. The evolution from traditional Applied Behavior Analysis (ABA) models has led to significant advancements. In 2015, scholars categorized several empirically supported ASD early intervention models implemented in natural settings under the category of Naturalistic Developmental Behavioral Interventions (NDBI). Among these, the Early Start Denver Model (ESDM) has shown significant improvements in children's cognitive and communication abilities. Lin et al. (2020) conducted the first study of ESDM in Taiwan. Results showed significant differences in pre- and post-intervention scores on the parenting stress subscale for the ESDM group, while the control group showed no change. Long-term studies on the impact of ESDM interventions on parents' mental health are relatively limited, both internationally and in Asia; therefore, we aim to explore this topic in Taiwan.

Objectives: This study aims to extend the findings of Lin et al. (2020) by conducting a four-year follow-up study to examine the long-term effects of ESDM intervention on parenting stress, parental self-efficacy, and quality of life.

Methods: A quasi-experimental design was used, utilizing longitudinal data from Lin et al. (2020) (Time 1 to Time 3) to assess the same children during their school-age years (Time 4). The children were divided into two groups: an ESDM group ($n=17$), which received individual ESDM interventions for six months (approximately 8 to 9 hours per week) while parents attended bi-weekly, 1-hour parent group-based parent-education sessions, and a control group ($n=17$) that received standard community treatment. Parents completed several questionnaires, including the Parenting Stress Index, Fourth Edition (PSI-4), the Chinese Version of the Maternal Parental Self-Efficacy Scale (MPSES), and the Brief Version of the World Health Organization Quality of Life Instrument in Taiwan version (WHOQOL-BREF), and the Depression, Anxiety and Stress Scale - 21 Items (DASS-21).

Results: Both groups showed a significant reduction in parenting stress from Time 1 (T1) to Time 4 (T4) ($F=27.238$, $p<.001$), and from Time 3 (T3) and Time 4 ($F=31.090$, $p<.001$), as well as quality of life (T4-T1: $F=32.589$, $p<.001$; T4-T3: $F=28.863$, $p<.001$), by the Group interaction different. However, the Group-by-Time interaction differences were not sustained during the four-year follow-up. Parents in the ESDM group reported significantly higher levels of parental self-efficacy (T4-T1: $F=18.288$, $p<.001$; T4-T3: $F=13.093$, $p<.001$), and lower depressive symptom levels compared to the control group ($t = -2.053$, $p=0.049$).

Conclusions: The current study is among the few to conduct long-term follow-up on the impact of ESDM interventions on the mental health of parents of autistic children. The results indicate that ESDM has lasting effects, reducing parenting stress, enhancing parental self-efficacy, and improving quality of life. These findings suggest that ESDM not only benefits children but also plays a crucial role in supporting parental mental health, further reinforcing its long-term value as an effective intervention.

430.172 Preliminary Effects of Pivotal Response Treatment in a Diverse Sample of Preschoolers with Developmental Disorders

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Background: Children with neurodevelopmental disorders (NDD) including autism spectrum disorder (ASD) exhibit greater social communication difficulties than the general population. Evidence suggests that early behavioral interventions that target child motivation, such as Pivotal Response Treatment (PRT), improve language and social behaviors in children with NDD. However, many children with NDD are excluded from early intervention research due to inclusion criteria or study requirements. For instance, children may be excluded if English is not the primary language spoken at home or they do not meet diagnostic criteria (e.g., ASD diagnosis). Additionally, families might be unable to meet the time and travel commitments of the study protocol. Importantly, very little research has focused on response to intervention in a diverse sample of youth who are excluded from more rigorous randomized controlled trials.

Objectives: To evaluate the effects of a 12-week PRT program on social communicative skills in a heterogeneous sample of children with NDD who did not qualify for other early intervention trials or their families were unable to meet study requirements.

Methods: Recruitment for this program is ongoing. Participants to date include 15 children with NDD aged 2-5:11 years ($M=2.6$ years; $SD=1.12$; 80% male; 27% White; 73% Asian) and their parents. Children received 12 hours weekly of PRT in an early intervention classroom ($n=13$) or in-home setting ($n=2$), for a total of 12 weeks. Parents received weekly PRT parent training sessions with a BCBA. At baseline and week 12, parents completed the Social Responsiveness Scale Second Edition (SRS-2), Stanford Social Dimensions Scale (SSDS), and the Repetitive Behavior Scale-Revised (RBS-R).

Results: Findings indicated significant improvements between baseline and week 12 in the SRS-2 total score ($t(14) = 1.77$; $p = 0.049$) and the social communication and interaction (SCI) subscale ($t(14) = 2.36$; $p = 0.017$). Youth with NDD also demonstrated significant improvements in the empirically-derived SRS-2 factors of attachment and affiliation ($t(14) = 2.54$; $p = 0.012$; Uljarević et al., 2021), emotion recognition ($t(14) = 2.027$; $p = 0.031$) and reduced social ($t(14) = 1.815$; $p = 0.045$; Frazier et al, 2014). Significant improvements were also observed in parent-rated scores on the SSDS in the social affiliation ($t(15) = -2.82$; $p = 0.006$), expressive social communication ($t(15) = -2.33$; $p = 0.017$), and social recognition subscales ($t(15) = -2.45$; $p = 0.013$).

Conclusions: Findings from this study suggest improvements in distinct facets of social functioning in a heterogeneous sample of youth with NDD participating in an early intervention program. Available parent-report data suggests that PRT shows efficacy for improving emotion recognition and reducing social avoidance, both signs of an improvement in social skills. Regarding future directions, the high number of bilingual children seeking early intervention highlights the need to develop and refine methods that capture treatment-related changes in a linguistically diverse sample. Ongoing research should also focus on optimizing the design of inclusive and accessible early intervention trials.

430.173 Preliminary Family Outcomes of a Community-Based Trial of Project Impact for Toddlers

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Background: Evidence-based practices exist for supporting the development of toddlers at high-likelihood of autism, but high-quality delivery of these practices in community settings remains challenging. While there is considerable variability in publicly funded early intervention (EI) services, caregiver-mediated naturalistic developmental behavioral interventions (NDBIs) are considered best practice. The current study examines the efficacy of the NDBI Project ImPACT (Improving Parents As Communication Teachers; Ingersoll & Dvortcsak, 2019) in comparison to existing EI services across California in a randomized community-based trial.

Objectives: This study explored the efficacy of Project ImPACT (PI) in comparison to usual care EI services offered in community settings. Initial outcomes examined across groups include children's social and communication skills as well as caregiver's use of responsive parenting behaviors.

Methods: The sample includes 122 caregiver-child dyads who were actively enrolled in community-based EI to support social communication development. Children were 55% Latino ($n = 67$) with a mean age of 25 months ($SD = 5$) at entry, and 86% of caregivers were mothers ($n = 105$). Timing of therapist training in PI was randomized in a waitlist control design. Dyads participated in either usual care EI or PI, based on whether their participating therapist had received PI training at the time of service delivery. Study assessments were collected at intake and after approximately four months of intervention (approximate time for PI completion). At both timepoints, caregivers completed the Vineland-3 (Sparrow et al., 2016), the Communication and Symbolic Behavior Scales: Developmental Profile Infant-Toddler Checklist (CSBS DP ITC; Wetherby & Prizant, 2002), the Developmental Profile-3: Communication scale (Alpern, 2007), and a 10-minute caregiver-child play interaction. Play interactions were coded from video recording, using the Parenting Interactions with Children: Checklist of Observations Linked to Outcomes (PICCOLO; Roggman et al., 2013). Preliminary results were analyzed with a repeated measures analysis of variance to examine change over time across usual care versus PI groups.

Results: Results demonstrated a significant time by group interaction for the CSBS Social Composite ($F(1,70) = 5.1$, $p < .05$), VABS Communication ($F(1,71) = 3.89$, $p < .05$), and PICCOLO Responsiveness ($F(1,54) = 5.95$, $p < .05$), such that dyads receiving PI demonstrated more progress on these measures than dyads receiving usual care EI. Significant growth in both groups across time was demonstrated on other scales of the CSBS (Speech $F(1, 69) = 28.49$, $p < .05$) and Symbolic ($F(1,70) = 19.14$, $p < .05$) as well as the PICCOLO Teaching domain. ($F(1,54) = 11.77$, $p < .05$). Lastly, no significant change was demonstrated in either group for the remaining scales of the VABS (Daily Living Scales, Social, Motor, or Adaptive Behavior Composite), the DP-3 Communication or the Affection or Encouragement scales of the PICCOLO (all $p > .05$).

Conclusions: Analyses revealed positive effects for PI in key areas for children in need of social communication support. Children in both EI groups progressed equally on some measures. Differential changes on CSBS and PICCOLO subscales relative to usual care EI are consistent with pilot study results (Stahmer et al, 2020).

430.174 Preliminary Outcomes of a Randomized Controlled Trial of Center-Based Pivotal Response Treatment for Preschoolers with Autism Spectrum Disorder

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Background: Many young children with autism spectrum disorder (ASD) demonstrate significant delays in social communication skills. Pivotal Response Treatment (PRT) employs strategies to improve child motivation and a growing body of literature supports the efficacy of PRT for improving language and social behaviors. However, research related to optimal treatment structure, location, and modality is limited.

Objectives: The aim of this randomized controlled trial is to evaluate the short-term benefits (12 weeks) of center-based PRT (PRT-C) on symptom severity in autistic preschoolers. This trial investigates whether children in the PRT group will show greater improvement in social communication skills compared to children in a delayed treatment control group (DTG). Changes in parent fidelity of treatment implementation and satisfaction with components of the training are also explored.

Methods: Recruitment for this trial is ongoing. Participants to date include 40 children with ASD, aged 2-4;11 years ($M=38.1$ months; $SD=6.5$) with significant developmental delays. Children were randomly assigned to PRT-C ($N=20$) or DTG ($N=20$). During PRT-C, children received 12 hours per week of PRT in an early intervention classroom setting, for a total of 12 weeks plus weekly parent training. An expert clinician naïve to treatment assignment completed the Clinical Global Impression Improvement rating (CGI-I) at week 12 and parents completed the MacArthur-Bates Communicative Development Inventory (CDI) and a treatment satisfaction survey at baseline and week 12. In addition, parent-child interaction videos were coded by blinded raters using the Brief Observation of Social Communication Change () protocol and using established definitions to assess parents' fidelity of PRT implementation.

Results: Preliminary analyses of ratings indicate that children in the PRT-C group show more overall improvement in symptom severity compared to children in the DTG ($\chi^2(3, N=30) = 14.46, p = .002$). On the CDI – Words Produced Score between baseline and week 12, there was a main effect of time, but no significant between group difference ($F(1,35) = 2.63; p = .114$). Additionally, there were no differences between groups between baseline and week 12 on the BOSCC total score ($F(1,36) = 2.07; p = .159$). Parents in the PRT-C group demonstrated statistically significant improvement in fidelity of PRT implementation compared to parents in the delayed treatment group ($F(1,31) = 13.12; p = .001$). Parents in the PRT group demonstrated mean increases in overall PRT fidelity from baseline ($M = 53.63\%$; $SD = 27.33\%$) to week 12 ($M = 82.31\%$; $SD = 16.02\%$). Overall, 93% of parents indicated satisfaction with their child's language development and 83% of parents indicated satisfaction with their child's improvement in other skill domains ($N=35$).

Conclusions: Available data suggest that the center-based model shows preliminary efficacy for improving child symptom severity. However, to date, the benefits on language and social communication measures are similar to those observed in the control group. Weekly parent training was effective in teaching the majority of parents to implement PRT with fidelity and parents expressed satisfaction with their children's progress. Future analyses will focus on predictors of differential treatment response in the full sample.

430.175 Probability of Intervention Benefit in an Early Intervention for Autistic Children

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Background: Early intervention can help improve the outcomes of children, sometimes dramatically. RCTs of behavioral interventions for children with autism often show statistically significant differences between treatment and control groups. However, the effect sizes in those studies, and the outcomes they measure, can vary considerably (meaning their real-life significance can be hard to interpret; Sandbank et al., 2024). For this reason, it is a priority that clinicians help families understand and compare various intervention choices using data driven and/or probabilistic approaches.

Objectives: The objectives of this study were: (1) to evaluate the feasibility of applying a probabilistic approach to understanding the effectiveness of early interventions for young autistic children and (2) to evaluate the predictors of response in an evidence based intervention.

Methods: This is a secondary analysis of data from a randomized controlled trial of a parent-mediated intervention for young autistic children (Early Start Denver Model; ESDM- Rogers et al., 2019). From baseline to the final timepoint was 24 months (see Table 1 for demographics). Change in social communication was measured using the Brief Observation of Social Communication Change (BOSCC; Grzadzinski et al., 2016). Reliable change for each participant was measured by generating a Reliable Change Index (RCI; Jacobson & Truax, 1992). Children with an RCI score less than -1.96 were considered as making reliable change (i.e., decreases in BOSCC scores greater than expected by chance). Dichotomous predictors were generated based on median age, nonverbal DQ/IQ scores (less than or greater than 70), autism severity (ADOS CSS less than or greater than 7) and language level (no words or some words). Logistic regression was used to determine if the probability of reliable change differed between the treatment and control group based on the dichotomous predictors (see Lindhiem et al., 2012).

Results: Related to objective 1, 33 children in the intervention group saw reliable decreases (73%) in BOSCC scores (decreases signify improvements), 11 children did not make reliable change in either direction (24%), 1 saw a reliable increase (2%). 23 children in the control group showed reliable decreases in BOSCC scores (57%), 17 children did not make reliable change in either direction (43%), none saw reliable increases. Related to objective 2, the largest difference in the probability of reliable change between the intervention and control group was seen in those with nonverbal DQ/IQ scores of 70 or less (82% in ESDM compared to 25% in control). Children younger than 22 months (79% compared to 58%) and children with ADOS CSS scores greater than 7 (75% compared to 44%) were also more likely to make reliable change in the ESDM group. Differences in probabilities based on all predictors are presented in Figure 1.

Conclusions: These data provide proof of concept for the application of a probabilistic, individualized approach to data from RCT. Results point to the potential utility of analyzing data at an individual, rather than group level, using standardized assessment data. Prospective trials are necessary to replicate these findings to determine whether this approach can be used clinically.



430.176 Provider Implementation of RIT in Part C Early Intervention Settings: Results from a Randomized Controlled Trial

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Background: Although evidence-based interventions such as Naturalistic Developmental Behavioral Interventions (NDBIs) benefit autistic children (Zwaigenbaum et al., 2015), many families face barriers to accessing these services (Stadnick et al., 2015). The U.S. federally-mandated Part C early intervention (EI) system, which provides services to young children with developmental delays, is a promising setting for delivering NDBIs and training caregivers to use evidence-based intervention strategies with their child. Recent research has demonstrated the positive effect of implementing NDBIs, such as Reciprocal Imitation Training (RIT), with EI providers on outcomes such as adoption, feasibility, and self-efficacy (Ibañez et al., 2021). However, less is known about implementation efforts on provider fidelity of NDBIs and downstream effects of child and family outcomes.

Objectives: This study evaluated the implementation of Reciprocal Imitation Teaching (RIT), an NDBI focused on improving the pivotal skill of child imitation, within Part C EI settings across the United States.

Methods: The study utilized a pragmatic RCT design to examine the effect of an 8-hour RIT training workshop on a variety of implementation outcomes for Part C EI providers (e.g., adoption, sustainment, perceived effectiveness, feasibility, self-efficacy, RIT fidelity, and use of child-centered and parent coaching intervention skills) compared to a 4-hour active control training focused on improving daily routines (DR). Descriptive statistics were used to examine RIT adoption, RIT sustainability, RIT feasibility, and perceived RIT effectiveness. Hierarchical linear modeling (HLM) was used to examine the trajectory of change in provider outcomes across time points.

Results: Fifty-six EI providers enrolled in the study (RIT = 28, DR = 28). Providers completed measures online at 5 timepoints: Pre-Training, and 1-, 3-, 6-, and 12-months post-training. Analyses revealed that providers trained in RIT adopted RIT and used it with both autistic children and those without an autism diagnosis. Providers also sustained their use of RIT over the 12 months following the workshop. Providers consistently reported RIT as feasible and effective, with perceived effectiveness ratings increasing over the year following their training. Additionally, training in RIT significantly enhanced provider self-efficacy in working with children with social communication delays and their families. Providers in both the RIT and control groups self-reported the sustained use of RIT-specific strategies and child-centered intervention approaches post-training. Provider use of caregiver coaching strategies did not increase significantly.

Conclusions: These results underscore the potential for naturalistic early interventions such as RIT to be implemented effectively with providers serving autistic children and their families in community-based settings. Though beyond the scope of this current study, next steps include examining the effects of provider use of RIT or caregiver coaching in RIT on child and family outcomes. As fidelity and use of child-centered strategies were similar across both groups and neither group improved in their use of caregiver coaching strategies, future directions may include a more nuanced, behavioral examination of provider implementation with children on their caseload. Additionally, future research in this area may serve to examine whether booster sessions or expert consultation may further improve provider use of specific RIT and caregiver coaching strategies.

430.177 Quality of Life As an Outcome in Randomized Controlled Trials of Pivotal Response Treatment

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Background: Pivotal Response Treatment (PRT) is a naturalistic intervention aimed at building communication skills in young children with autism. Ultimately, PRT is hoped to improve autistic children's quality of life (QoL). The World Health Organization defines QoL as "an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns." QoL thus encompasses an individual's health, well-being, social connectedness, and life satisfaction. However, few studies have investigated PRT's effect on QoL, despite community members identifying QoL as a highly important outcome.

Objectives: To assess whether PRT delivered to young children with autism impacts children's QoL as reported by caregivers.

Methods: Data from three positive PRT RCTs were combined to assess potential changes in QoL after PRT. Trials included a study of PRT parent training delivered in a group (PRT-G), a PRT package including individual parent training plus in-home, clinician-delivered PRT (PRT-P), and an individual telehealth parent training study (PRT-T). In total, 130 autistic children (2–6 years old; 104 male, 26 female) and their parents participated (n=67 randomized into the active PRT group). The Pediatric Quality of Life Inventory (PedsQL) was completed by parents at baseline and 12 weeks later; change scores (Week12-baseline) were computed. Differences in PedsQL change scores (total and subscales) between intervention and control groups were assessed using independent-measures t-tests. The study investigated item-level differences with the most intensive intervention (PRT-P).

Results: PedsQL scores were not significantly different between intervention and control groups at baseline ($t_s < 1.60$, $p_s > .050$). Across the three RCTs, there were no significant differences between the intervention and control groups with regard to PedsQL change scores across all subscales (see Table 1). There were also no significant differences in change over time between intervention and control groups in each of the individual studies ($p_s > .05$), though the Social QoL domain did show medium effects in PRT-P ($d = 0.583$) and PRT-T ($d = 0.621$). When looking at item-level changes in Social QoL within PRT-P, one item – *Getting teased by other children* – showed significant improvement in the intervention group compared to the control (see Table 2).

Conclusions: To our knowledge, this is one of the first investigations of PRT's impact on QoL. While we did not find significant differences between the intervention and control groups regarding the effect of PRT on QoL, there was some preliminary evidence of potential improvement in Social QoL. Though it is possible that PRT has a limited impact on QoL, it is also possible that other measures of QoL, such as those that focus specifically on Family QoL, might be better suited for capturing intervention-related changes. Additionally, QoL perceptions may vary between reporters (i.e., parent versus child). Longitudinal research is needed to understand the long-term effects of PRT on QoL. Further research with larger samples, varied measurement tools, and longitudinal data collection can provide more insights into intervention effects on QoL.



430.178 Real-World Insights: Tracking Communication Gains in Autistic Preschoolers in a Virtual Caregiver-Delivered Program

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Background: Caregiver-delivered programs are a best practice for supporting autistic preschoolers (Zwaigenbaum et al., 2015). While extensively evaluated in research settings, practice-based evidence from real-world implementation is needed. One method to achieve this involves using standard clinical information, where valuable research-relevant data can be found (Epstein et al., 2002). A second key need in the intervention field is moving beyond measuring overall effectiveness to exploring for whom different programs work best and for which goals, that is, identifying moderators (Trembath et al., 2019). In this practice-based research study, we capitalized on an opportunity to use existing clinical forms for autistic preschoolers participating in a virtual, community-based, caregiver-delivered program, More Than Words® (MTW), to explore changes in and moderators of communication development for use in future pragmatic (real-world) clinical trials.

Objectives: Our project objectives were to: (a) identify data that can be extracted from standard-of-care clinical forms to track autistic children's communication development during the program, and (b) explore if changes in communication development during the program was moderated by the social communication skills of the child at the start of the program.

Methods: Two forms already familiar to clinicians were completed pre- and post-program for 36 children (24 to 66 months) who participated in the virtual MTW program in Ontario, Canada. The MTW *Social Communication Checklist* (SCC), a program-specific form completed as part of the standard delivery of the program, was used to identify the child's social communication stage and changes in social communication skills during the program. The second was the *Focus on the Outcomes of Communication Under Six* (FOCUS-34), a valid and reliable criterion-referenced tool used widely in Ontario to measure changes in communicative participation due to intervention, that is, changes that are greater than would be expected due to the passage of time alone. The FOCUS-34 also tracked changes in different areas of communication (e.g., receptive and expressive language). Exploratory analyses examined changes in communication development during the program according to participants' social communication stage.

Results: Results from the SCC indicated that most children moved up a social communication stage ($n = 15$) or stayed in the same stage but gained new skills within that stage ($n = 15$). Of the 36 children who completed the program, 61% ($n = 22$) showed a meaningful clinical change on the FOCUS-34. Using the SCC to group children by social communication stage, those at the lowest stage showed the most gains in the category of social play on the FOCUS-34, while those in the highest stage group made the most gains in expressive language.

Conclusions: This practice-based research project demonstrates how existing clinical tools can be used to track development and explore individual differences. Preliminary evidence that the same program can impact different goal areas depending on the child's pre-program social communication skills. Even if not collected in a research setting, program-specific forms can provide data to describe participants' abilities when assessing program outcomes. Researchers should leverage real-world clinical data to develop practice-based evidence while prioritizing exploring moderating factors.

430.179 Self-Regulation in at-Risk Toddlers: Trajectories across a Parent-Mediated Intervention

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Background: Self-regulation is a pivotal skill in early development and refers to a child's capacity to manage behaviors across cognitive, emotional, and social domains. Self-regulation development in early childhood plays a crucial role in shaping future developmental outcomes. Since toddlers have limited self-regulatory abilities, they rely heavily on their caregivers to help them manage their responses to environmental stimuli. When a toddler struggles with self-regulation, caregivers actively support the child's regulation through a co-regulation process. Numerous studies have explored the progression of self-regulation in young children (e.g., Althoff et al., 2010; Garner & Waajid, 2012; Werner & Milyavskaya, 2019), highlighting early childhood as a pivotal period for acquiring and refining such skills. However, to date, there are limited studies examining the self-regulatory behaviors of toddlers with developmental risk.

Objectives: This study aimed to examine the changes in self-regulation trajectories among toddlers identified as developmentally at-risk over the course of a 16-week parent-mediated telepractice intervention. This study focused on the influence of parental responsiveness during self-regulatory actions in toddlers.

Methods: The study included six children aged 12-48 months, who were either diagnosed with or considered at risk for autism spectrum disorder (ASD). Participants were randomly assigned to one of two groups: (1) a parent-mediated intervention group; or (2) a parent-mediated intervention group with additional annotated feedback on home play intervention videos. Caregivers completed several assessments including the Brief Infant-Toddler Social Emotional Assessment (BITSEA), the Social-Emotional Assessment & Evaluation Measure (SEAM), and the Early Social Communication Scales (ESCS) as well as caregiver responsiveness coded through observations measured by the Parent-Child Interaction System (PARCHISY). Children were evaluated at three assessment points: pre-intervention, midpoint, and post-intervention and participated in two observed self-regulation tasks: the Snack Delay and Locked Box tasks. Tasks were designed to assess the children's self-regulation behaviors, including arousal and emotional regulation with each task being modified to align with the developmental ages of the participants.

Results: The repeated measures ANOVA results revealed no significant differences between the two groups. However, negative parental content (affect and responsiveness) was found to decrease from pre-intervention to post-intervention ($M = 2.00$, $SD = 1.00$; $M = 2.33$, $SD = 1.154$; $M = 1.667$, $SD = 1.154$; $M = 2.00$, $SD = 1.000$). One-way ANOVA results for the BITSEA at pre-intervention were statistically significant ($F(1,4) = 9.191$, $p = .039$). Furthermore, the SEAM and ESCS scores exhibited upward trends across all timepoints. Although simple linear regression results did not show significant findings for most tasks, the locked-box self-regulation task yielded notable trends toward significance at both pre- and post-intervention ($R^2 = .356$, $F(1,5) = .552$, $p > .05$).

Conclusions: Understanding the association between maternal content (positive and negative affect and responsiveness) in interactions and toddler self-regulation is critical for gaining insights into how parenting practices shape at risk children's ability to regulate emotions during a targeted intervention. This study highlights the importance of targeting self-regulation trajectories in the context of parent-mediated interventions for toddlers diagnosed with autism and those with autism risk behaviors.

430.180 Social Motivation and Social Skills Program Outcomes for Autistic Youth: PEERS® for Preschoolers

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Background: The social motivation hypothesis proposes that the neurobiological differences in attention and reward processes to social and nonsocial stimuli present in autism contribute to reduced opportunities for autistic children to learn and have reduced social motivation, contributing to social deficits, which may impact their ability to develop typical social cognition and behavior through social learning (Chevallier et al., 2012; Clements et al., 2018). The downstream cascading effects of reduced social motivation can therefore result in difficulties forming and maintaining relationships with peers, despite often strongly valuing and desiring such connections (Black et al., 2024). PEERS® for Preschoolers (P4P) is an evidence-based, parent-assisted social skills program for young autistic children and those with other social challenges, teaching age-appropriate skills and promoting positive peer relationships (Park et al., 2022). Previous research has shown that higher social motivation in autistic populations is associated with improved social skills and fewer social challenges (Itskovich et al., 2021; Neuhaus et al., 2021). However, there is limited understanding of how social motivation may impact the treatment response to social skills programming aimed at enhancing positive social skills and increase social competence in autistic children.

Objectives: The purpose of this study is to investigate social motivation as a predictor of program outcomes among autistic youth prior to and following the P4P program.

Methods: Participants included 74 autistic children between 4-6 years (77% male, $M_{age}=4.7$, $SD=0.82$) and their parents who attended P4P. Social motivation was assessed via the Social Responsiveness Scale, 2nd Edition (SRS-2; Constantino & Gruber, 2008), using the social motivation treatment scale T-score. Child outcomes were assessed via parent-reported scores from pre- to post-programming on the Social Skills Improvement System Social Skills (SSiS-SS; Gresham & Elliott, 2008), while social engagement was measured by the number of playdates recorded in the Quality of Play Questionnaire (QPQ; Frankel et al., 2010). The Parenting Stress Index, 4th Edition, Short-Form (PSI-4-SF; Abidin, 2012) was used to measure parenting stress. A multivariate analysis of variance (MANOVA) assessed the impact of baseline social motivation on changes in program outcomes.

Results: Following participation in P4P, results demonstrated significant improvements in SSiS-SS ($M_{change}=5.52$, $SD=12.38$), QPQ ($M_{change}=0.95$, $SD=3.53$), and PSI ($M_{change}=2.29$, $SD=6.71$) scores. However, multivariate tests indicated that baseline social motivation did not significantly predict changes in program outcomes (*Wilk's Λ* =.889, $F(3,38)=1.576$, $p=.211$).

Conclusions: Findings demonstrated that baseline social motivation did not significantly influence degree of change on primary outcomes for autistic children following PEERS® for Preschoolers program. This is encouraging as it suggests young autistic children with varying social motivation profiles may benefit from the program. However, given recent research suggesting that the SRS-2, and in particular the social motivation scale, may be confounded by symptoms of anxiety (South et al., 2017; Capriola-Hall et al., 2021), further research is warranted. Future research should continue to explore moderators of P4P response in the light of heterogeneity in autism presentation to inform clinical care and recommendations.

430.181 Systematic Review on Sibling-Mediated Intervention through an Intersectional Lens

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Background: Sibling-mediated interventions (SMIs) represent a growing area of research aimed at leveraging the natural dynamics within sibling relationships to support individuals with intellectual and developmental disabilities (IDD). Siblings often play critical roles in the lives of individuals with IDD, yet their potential contribution as mediators in interventions has been underexplored. SMIs can offer a unique, sustainable, and culturally responsive method to promote social, cognitive, and behavioral outcomes for individuals with IDD, while also potentially benefiting neurotypical siblings. However, the extent to which intersectional factors, such as race/ethnicity, language, and socioeconomic status, are considered in these interventions remains unclear.

Objectives: This systematic review aims to synthesize existing literature on SMIs for individuals with IDD. Specifically, the review will explore: (1) the efficacy of these interventions in improving outcomes for individuals with IDD, (2) the impact of SMIs on the neurotypical sibling, and (3) the extent to which intersectionality is embedded in the development and implementation of SMIs.

Methods: A comprehensive search of peer-reviewed journal articles was conducted across databases, including APA PsychInfo, ERIC, Medline, Academic Search Complete, and Education Source. Independent screening was performed by the first and second authors using the blind function on Rayyan. While the second author's screening is still in progress, the authors expect to complete the screening and develop coding schemes by the end of October, with initial coding finalized by the end of November. Both authors have committed to adhering to PRISMA guidelines throughout the screening and coding process.

Results: Preliminary analysis based on the first author's screening suggests that SMIs show promising outcomes for individuals with IDD, particularly in enhancing social skills and fostering sibling relationships. Early findings also highlight a lack of attention to cultural and intersectional factors within these studies. The final results will offer a comprehensive synthesis of SMI effectiveness, identify recurring themes in intervention design, and assess gaps in research on diverse populations.

Conclusions: Although the final results are pending, this review is anticipated to provide valuable insights into the effectiveness of sibling-mediated interventions for individuals with IDD. It will emphasize the potential of SMIs to support both individuals with IDD and their siblings while underscoring the need for more inclusive research that considers cultural and intersectional dynamics. This review will inform future research, practice, and policy by offering recommendations for developing more equitable and effective SMI programs that address the diverse needs of families.

430.182 Training and Ongoing Feedback Process for Maintaining Discrete Trial Teaching Intervention Fidelity across Multi-Site Randomized Control Trial Studies

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Background: Fidelity, in the context of implementing an intensive, behavioral intervention for autism such as Discrete Trial Teaching (DTT), refers to ensuring the intervention is implemented in the way it was intended. Fidelity checks can be used to ensure treatment adherence and quality. Fidelity is critical because it has a relationship to treatment outcomes, including within studies evaluating autism interventions such as DTT. The general method for DTT is taking a larger skill, breaking it down into smaller parts, and systematically teaching the parts by using a most to least prompting hierarchy (being quickly faded), multiple opportunities for practice (trials), reinforcement, and error correction.

The creation of a treatment reliability process can minimize treatment drift as experts provide consistent training, feedback, and oversight to interventionists. There is limited consensus around how fidelity is conducted for intensive, behavioral interventions such as DTT. Therefore, establishing and evaluating fidelity in these types of interventions is critical.

Objectives: The objective is to explore the frequency of corrective feedback from fidelity data collected across studies in order to assess interventionists' reliability and inform initial, ongoing, and future training.

Methods: We explored DTT interventionist fidelity across two multi-site trials for autistic children with minimal spoken language. Interventionists received training and demonstrated at least 80% fidelity across three practice participants before working with study participants. Interventionists received feedback every one to two weeks.

DTT experts for each study provided interventionists with fidelity ratings based on randomly chosen 10-minute session recordings. A standardized fidelity form included thirteen categories outlining best practices for DTT implementation. Each category used a Likert scale rating (0-5, or not applicable), and included space for written feedback and an overall fidelity score.

An exploratory secondary data analysis was conducted via retrospective manual review of fidelity forms. Excel was used to stratify (by study and site), randomly select fidelity forms across participants, and organize a component analysis of the thirteen fidelity categories. Data elements included: site, case number, session phase, week, date, interventionist and rater initials, overall score, and whether written corrective feedback was provided.

Results: The overall mean score of 70 fidelity forms from across both studies was greater than 90%. Corrective feedback percentages based on feedback opportunity per category ranged from 10% to 51% of the sample (see figure 1).

Conclusions: Overall fidelity ratings were consistent and high across two major intervention trials focused on language development in autistic children. The areas of DTT implementation that showed the most frequent need for more explicit feedback were error correction and prompting procedures. This information can inform future training and help DTT supervisors pinpoint potential treatment drift areas.

Future directions using fidelity data should be expanded to identify feedback needed during different phases of the studies, evaluate Likert scale information by category, and explore correlations between implementation location and outcomes or fidelity scores and participant outcomes.

Future research could include replicating or adjusting the training and feedback process in other settings or applications for DTT fidelity monitoring.



430.183 Treatment Engagement in Tele-PCIT Among Underserved Youth with Neurodevelopmental Disorders: Clinical Presentation and Sociodemographic Factors

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Background: Children with neurodevelopmental disorders (ND), such as autism spectrum disorder (ASD) and ADHD, are more likely to present with elevated disruptive behaviors (e.g., oppositionality, aggression, impulsivity). Parent Child Interaction Therapy (PCIT) is a parent training program that has shown efficacy for children with ND in reducing disruptive behaviors (Bagner et al., 2023). Telehealth delivery of PCIT increases access for families who experience systematic barriers and is deemed comparable in efficacy (Comer et al., 2017). Preliminary work has documented the robust impact of PCIT in achieving comparable post-treatment outcomes for children across diagnostic profiles and with a range of sociodemographic backgrounds when treatment is completed. However, little is known regarding the impact of families' sociodemographic factors and clinical presentations on treatment completion rates and engagement in PCIT.

Objectives: The purpose of this study is to examine the associations between a) sociodemographic factors and b) clinical presentations on treatment completion and engagement.

Methods: This study was conducted with 68 parent-child dyads (Child: $M_{age} = 4.95$, $SD = 1.19$) from underserved backgrounds who completed a time-limited version of PCIT via telehealth. Children had the following diagnoses: ASD (14.7%), ADHD (55.9%), ODD (20.6%), Global Developmental Delay (13.2%), Language Delay (45.6%), and Motor Delay (17.6%), and were predominantly male ($n=51$, 75%). All children had a receptive language age equivalent of at least 2.0 years. Treatment completion was classified as completion (10 sessions) or drop-out. Treatment engagement was measured via the amount of homework completed throughout the course of therapy. Analyses included logistic and linear regressions.

Results: 75% of this sample successfully completed treatment. Child autism diagnosis did not predict treatment engagement or completion. Child diagnosis of ADHD and parent diagnosis of depression were significant positive predictors of treatment completion (See Table 1). Children with ADHD were approximately 4 times more likely to complete therapy compared to children without ADHD ($p = .02$). Parents with a self-reported depressive disorder were approximately 12 times more likely to complete therapy compared to parents without a depressive disorder ($p = .02$). Child language level were also a predictor of treatment completion, with children with higher language abilities being more likely to complete therapy ($OR = 1.09$, $p < .01$). Higher child age ($\beta = -.35$, $p = .040$) was associated with lower treatment engagement (homework completion).

While limited in range, parent age, education, and income were not predictors of treatment engagement or completion (Tables 1 & 2).

Conclusions: PCIT is a highly effective treatment for disruptive behaviors in children with ND, but not all families are successful in engaging in and completing treatment. This study highlights the importance of considering families' clinical presentation (i.e., age, diagnosis, language level) and sociodemographic factors in promoting treatment engagement and completion. Results of this studies also underscore the suitability of telehealth when engaging with parents with history of depression. Future research should consider these variable in matching families to treatment modality such as virtual vs. in person treatment.



430.184 Understanding and Addressing Eating Problems in Autistic Children: A Case-Based Approach to Cause-Specific Interventions

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Understanding and Addressing Eating Problems in Autistic Children: A Case-Based Approach to Cause-Specific Interventions

Background: Eating problems at times can be the biggest challenge that we as therapists need to combat while teaching people to cope with autism. Nutrition is an important step in managing ASD specifically and this makes it essential for us to identify the causes of eating problems in children with autism and provide them with the appropriate interventions. Finding the root cause of the eating problem is usually the easiest way to manage it. In India, we seem to have a lack of awareness in regard to nutrition's role in managing Asd.

Objectives: We aim to discuss the different causes of eating problems in autistic children and how to identify the cause(s) specific to each child. We will elaborate through two cases with which we have been working. These cases also illustrate how finding the cause of these problems is most often the way to manage them.

Methods: Case Study1: The child is 4 years 9 month old with moderate autism. On the Indian Scale For Autism Assessment, he presented a score of 120. He was a premature kid with speech regression. Developmental Screening Test and Vineland Social Maturity Scale test, he presented with a score below 60 on both. On assessing his sensory profile, he got a score of 45/50 for his oral sensory score for sensitivity which is very high.

Case Study 2: The child is a four year 2-month-old with moderate autism. On the Indian Scale For Autism Assessment, he presented with moderate Autism. On conducting the Developmental Screening Test and Vineland Social Maturity Scale test, he presented with a score below 60 on both. He is also lactose intolerant. When presented to us, he would eat only certain foods based on his mood and has primarily consumed isom ilk since April 2021.

Results: We found exceptional improvement in the eating problems which our patients faced once we found out their cause.

Case Study 1: As of August 2024, the child has started drinking milk from a glass and selectively eating foods such as Dal (Lentil Soup), Rice, Milkshakes, Idli, Sambar, and Oats with Yogurt.

Case Study 2: As of January 2024, the child has started eating a variety of foods including Roti (flatbread), 2 types of Paratha, Makhana, Bread and Cornflakes at times depending on his mood. He has also started consuming Buffalo milk and has been completely off milk since December 2023.

Conclusions: In India, it is more common to try to force-feed children who do not like to eat food. Often, parents relate such food avoidance to picky eating. This, however, is not the case with a lot of the children on the autism spectrum. Hence, we have found it essential to reach the root cause of the problem to be able to target it.

430.185 An Exploratory Study on Clinical Outcomes of Low-Intensity Early Start Denver Model for Young Children with Autism Spectrum Disorder in Southern Taiwan

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Background: Young children with autism spectrum disorder (ASD) begin to exhibit communication and social difficulties from the early age, which subsequently affect their cognitive, social-emotional, and language development. Among the various early intervention models for ASD supported by empirical research, the Early Start Denver Model (ESDM) has gained attention for its integration of traditional applied behavioral analysis and developmental approaches, as well as its simultaneous intervention across multiple important developmental domains. Previous studies have established that long-term, moderate to high-intensity, ESDM intervention can positively impact the clinical outcomes of young children with ASD. However, implementing such programs in regions with limited access to early intervention services remains challenging.

Objectives: Given the severe shortage of resources in southern Taiwan, this study aimed to significantly reduce the intensity of ESDM intervention and used a single-subject design to evaluate the efficacy of the lower-intensity ESDM intervention for young children with ASD in southern Taiwan.

Methods: A single-subject experimental design was conducted with multiple probe designs across individuals. Three children aged 26 to 40 months and diagnosed with ASD participated in the low-intensity ESDM intervention, receiving 2 hours of intervention weekly for 24 weeks. Video recordings of child-therapist interactions during the baseline, intervention, and follow-up phases were analyzed using visual analysis to assess the impact on imitation, verbal expression, and social engagement. Various measurements were administered pre- and post-intervention, encompassing joint attention, play, communication, and language ability as proximal outcome indicators, with assessments such as the Taiwan version of Screening Tools for Autism in Two-Year-Olds (T-STAT) and the Mandarin-Chinese Communicative Development Inventory-Taiwan (MCDI-T). The distal outcome indicators entailed cognitive ability, symptom severity, adaptive behaviors, and behavioral problems, with assessments including the Mullen Scales of Early Learning (MSEL), the Autism Diagnostic Observation Schedule-Second Edition (ADOS-2), the Adaptive Behavior Assessment System-Second Edition (ABAS-II), and the Child Behavior Checklist for Ages 1½-5 (CBCL).

Results: Visual analysis of the recorded sessions indicated that the low-intensity ESDM intervention had a range of effects - from minimal to substantial - on imitation, verbal expression, and social engagement performances of three children. The overall effect on verbal expression was the most significant, followed by social engagement, and then imitation. Furthermore, even with only 2 hours of intervention per week, all children demonstrated improvements in nearly all proximal outcome indicators. In terms of distal outcome indicators, two out of the three children's developmental quotients improved in the MSEL (from 44 to 58, 76 to 90), while the other two children showed a decrease in symptom severity in the ADOS-2 (from 11 to 5, 23 to 18). However, there was little to no progress in adaptive behaviors and behavioral problems.

Conclusions: The findings demonstrated that the low-intensity ESDM intervention enhanced various developmental abilities in young children with ASD in southern Taiwan, especially in verbal expression. Future research may include larger sample sizes and utilize a control-group pretest-posttest design to further validate the efficacy of the low-intensity ESDM interventions for children with ASD.

Keywords: autism spectrum disorder, Early Start Denver Model, low intensity

430.186 Coaches' Perspectives on the Barriers and Facilitators to the Social ABCs Caregiver-Mediated Intervention for Toddlers with Autism

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Background: Research supports the involvement of caregivers in intervention programs for young children (i.e., caregiver-mediated early intervention - CMEI). CMEIs capitalize on natural caregiver-child interactions and increase the 'dosage' of treatment while also providing support to families (Zwaigenbaum et al., 2015). CMEIs have a substantial evidence-base (e.g., Frost et al., 2021). Among these, the Social ABCs stands as a well-established CMEI, designed for toddlers aged 12 to 36 months with confirmed or suspected autism (Brian et al., 2016; 2017). Nevertheless, certain families encounter challenges in accessing, engaging with, and deriving benefits from the program. While much is known about families' lived experiences, the perspectives of the clinicians delivering the programs are scarcely reported. This perspective has potential to shed light on families who do not complete the program, a key perspective that is usually missed.

Objectives: This study aimed to explore the barriers and facilitators that families experience from the perspective of the coaches delivering the program.

Methods: A mixed-methods exploratory sequential design was employed (Cresswell & Plano Clark, 2011) and using Braun and Clark's six-step reflexive thematic analysis (2006), the study examined barriers and facilitators from the perspectives of 30 coaches. Data were collected via a focus group (n = 6), followed by a survey (n = 30). We explored correlations between coach characteristics (e.g., education, training level) and top-rated survey items (corrected p-value of .0125 was used).

Results: Three key themes were established: (1) **Prioritization of the Social ABCs within family life**, (2) **Relationships among families, coaches, and systems** and (3) **Parental learning, understanding, and goal alignment**. Across themes, intake was a recurrent topic in the focus group discussion:

"[A] big facilitator is having the right questions asked at the intake process, it can really prepare the caregiver for what is to come".

The results from the survey bolster this finding, with coaches strongly endorsing the key role of intake across three organizing categories (access, engagement, and outcomes). Using a 5-point Likert scale, coaches strongly endorsed scheduling options and visit times as playing a key role in both access and outcomes (M=4.10 and 4.33), while and caregivers' upfront understanding of the Social ABCs expectations was strongly endorsed for its role in engagement (M= 4.37).

Finally, the role of coach level factors was explored, revealing that higher education levels of coaches were associated with greater importance attributed to caregiver involvement ($\rho = .47$, $p = .009$); viewing caregivers as decision-makers.

Conclusions: Findings reveal parsimony between quantitative associations (e.g., between coaches' educational level and their perceived importance of *parents as decision-makers*) and qualitative findings about the importance of the coach-parent relationship. A core issue that was woven throughout the coaches' responses was the way in which intake processes can scaffold (or prevent) successful access to and participation in care. In considering practical solutions, bolstering intake processes may be the most immediately actionable strategy to reduce barriers and facilitate positive outcomes. Future research into improving intake processes and studying their impact is a key area for practical application.

Poster Session

431 - Molecular and Cellular Biology I

May 2nd, 2025, 6:00 PM - 7:00 PM - Hall 4A

431.187 A Critical Period Sensitive to Hoxb8 Microglia in Mouse Brain

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Background: *Hoxb8* mutant mice show compulsive behavior similar to the repetitive behaviors in the Autism spectrum disorder in comorbidity with trichotillomania, a human obsessive-compulsive-spectrum disorder. The only *Hoxb8* lineage-labeled cells in the brains of mice are microglia, suggesting that defective *Hoxb8* microglia caused the disorder. We have shown the presence of two microglia subpopulations: canonical, non-*Hoxb8* microglia and *Hoxb8* microglia. Unlike non-*Hoxb8* microglia, *Hoxb8* microglia progenitors appear to be generated during the second wave of yolk sac hematopoiesis, then detected in the aorto-gonad-mesonephros (AGM) and fetal liver, where they are greatly expanded, prior to infiltrating the E12.5 brain.

Objectives: To investigate the effect of sensory deprivation on *Hoxb8* microglia function

Methods: Examination of the canonical, non-*Hoxb8* microglia and *Hoxb8* microglia

Results: Using whisker trimming based sensory deprivation model, our result suggests that the sensory deprivation during critical period reduces *Hoxb8* but not non-*Hoxb8* microglia density in contralateral hemisphere to the deprived hemisphere without affecting the non-*Hoxb8* microglia population. The effect is enhanced significantly in *Hoxb8* mutants. Given the crucial role of *Hoxb8* microglia in synaptic pruning, our current data suggests that *Hoxb8* microglia are highly sensitive to synapse density during critical period. Furthermore, we demonstrate the unique capabilities of *Hoxb8* microglia in synaptic pruning compared to non-*Hoxb8* microglia.

Conclusions: Non-*Hoxb8* microglia significantly outnumber *Hoxb8* microglia, but they cannot compensate for the loss of *Hoxb8* function in *Hoxb8* microglia, suggesting further crucial differences between the two subpopulations during critical period, synaptic development, synaptic pruning and postnatal synaptic maturation.

431.188 Aberrant Hippo Signaling Due to TAOK1 Mutation Leads to Brain Organoid Overgrowth

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Background: Mutations in the kinase encoding gene TAOK1 (Thousand and one amino acid kinase 1) cause a syndromic neurodevelopmental disorder (NDD) with developmental delay, macrocephaly and autism. Despite its association with brain development deficit, the precise function of TAOK1 in brain development and how its dysfunction leads to neuropathology remains unknown. To model TAOK1 dysfunction during early brain development, we generated human iPSC lines harboring a TAOK1 NDD and macrocephaly associated mutation, S111F that abolishes a key residue required for catalytic activity.

Objectives: We hypothesize that the kinase dead TAOK1 mutations contribute to pathogenesis of NDDs by affecting proliferation of neural progenitor cells (NPCs). In our study, we aim to investigate how TAOK1 dysfunction contributes to neurodevelopmental disorder using human iPSC derived NPCs and dorsal forebrain cortical organoids. Further, we use comparative phosphoproteomic analysis of control and TAOK1 mutants NPCs to identify pathways dysregulated in the mutant cells and to determine physiological neuronal substrates of TAOK1.

Methods: We generated human WTC11 iPSC lines harboring heterozygous (TAOK1S111F/+) and homozygous S111F mutation (TAOK1S111F/S111F) along with their isogenic control lines. Two distinct clones of each genotype were differentiated into dorsal forebrain neural progenitor cells (PAX6, NESTIN +ive) via two independent differentiations. The NPCs were immunostained with proliferation markers Ki-67 and Cyclin A2 to quantify the number of proliferating cells in each genotype. Cell cycle analyses of control and mutant NPCs were conducted using propidium iodide staining and flowcytometry to quantify the proportion of cells in various cell cycle stages. In addition, dorsal forebrain cortical organoids were derived from these iPSC lines and cryosectioned at DIV 70/90. The cryosections were stained for different layers of the cortex (PAX6, TBR2, SATB2, CTIP2, GFAP) and proliferation markers. Finally, to elucidate mechanisms that underlie increased proliferation in TAOK1 mutant organoids and macrocephaly in TAOK1 syndrome patients, we performed comparative phosphoproteomic analysis of control and TAOK1 mutants NPCs using five replicates for each condition.

Results: Immuno-staining with proliferation markers and flowcytometric analysis revealed a significant increase in the number of proliferative cells in the homozygous S111F mutant NPCs compared to the controls. In addition, cortical organoids generated from TAOK1 mutant iPSC lines showed a dramatically expanded proliferative zone (Pax6+ive) with higher numbers of actively dividing progenitors (CyclinA2 and Ki67 +ive) compared to isogenic control organoids at both DIV70 and 90. Pathway analyses and phosphopeptide analyses revealed differential phosphorylation of YAP/TAZ proteins in TAOK1 mutant NPCs indicating aberrant Hippo signaling. Immunocytochemistry and western blot revealed an increase in the total YAP protein concentration and nuclear enrichment of YAP/TAZ proteins in the mutant NPCs. Additionally, an increase in the expression of the YAP-TEAD target genes including CTGF, CYR61 and ANKRD in the mutant NPCs was confirmed using qPCR.

Conclusions: In summary, this study employs iPSC derived dorsal forebrain NPCs and cortical brain organoids, mass spectrometry and high-resolution imaging to unmask the effects of NDD associated mutants of TAOK1 on neuronal development and function. Our findings reveal aberrant Hippo signaling as a likely and druggable driver of the TAOK1 related neurodevelopmental disorders.

431.189 Altered Synaptic Density and Gene Expression in the Amygdala in Autism Spectrum Disorder

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Background:

Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder characterized by changes in social interaction and communication. Emerging evidence suggests that an imbalance between excitatory (E) and inhibitory (I) neurotransmission may underlie many of the core symptoms of ASD. The amygdala, a region critical for processing emotions and social behavior, has been implicated in ASD. Studies suggest that altered excitatory/inhibitory (E/I) balance within the amygdala may alter neurotransmission and connectivity within this region. While studies have documented synaptic abnormalities, the spatial relationship between synaptic density and gene expression at the cellular level remains largely unexplored.

Objectives:

This study aims to explore synaptic density and gene expression related to neurotransmission and E/I signaling in the amygdala of individuals with ASD. Specifically, we aim to assess whether synaptic density changes are mirrored by altered gene expression of excitatory and inhibitory synaptic components.

Methods:

To evaluate synaptic density, we identified synapses by staining tissue sections from the mid rostrocaudal amygdala using fluorescent immunolabeling of the proteins GAD65/67, markers of inhibitory GABAergic synapses, and the protein PSD95, a marker of excitatory glutamatergic synapses, in lateral, basal, and accessory basal nuclei. Synapses were quantified using the Synapse Counter module in Fiji. To evaluate gene expression, we performed a multiplex gene expression assay (QuantiGene Plex) from 2mm biopsy punches of fresh frozen tissue of the lateral, basal, and paralamina amygdala. To spatially map gene expression, we used RNAscope (HiPlex v2) to visualize gene expression associated with inhibitory and excitatory neurotransmission in the lateral, basal, and accessory basal nuclei of the amygdala.

Results:

Our analysis revealed an increase in inhibitory synaptic density measured by GAD65/67 immunolabeling in the lateral, basal, and accessory basal nuclei of the amygdala in ASD cases compared to neurotypical (NT) cases while no significant differences were found in excitatory synaptic density measured by PSD95 immunolabeling. At the regional level, QuantiGene analysis showed no significant differences in the expression of *GAD1/GAD2* in the lateral and basal nuclei. However, expression of genes associated with excitatory neurotransmission, (*SLC17A7* and *DLG4*) showed significantly increased expression specifically in the lateral nucleus.

Conclusions:

Our results suggest that lateral amygdala in ASD is characterized by an increase in inhibitory synapse density, measured through protein marker labeling. No corresponding changes in gene expression for these same markers was observed. In contrast, no changes in excitatory synapse density, measured by protein markers, was observed. However, genes associated with these markers (*SLC17A7* and *DLG4*) were increased in expression. These results point toward a potential compensatory mechanism in ASD, wherein altered excitatory gene expression in the absence of changes in excitatory synaptic density may counterbalance heightened inhibitory synapse density. RNAscope analysis provides spatial context to these findings, offering further insight into amygdala synaptic architecture in ASD. This study advances our understanding of the molecular mechanisms underlying synaptic dysregulation in ASD and may point towards novel therapeutic targets for restoring E/I balance.

431.190 Single-Cell Investigation of Telencephalic Development in Mouse Models with Chd8 Haploinsufficiency

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Background:

Mutations in the chromatin-remodeling factor CHD8 are closely linked to autism spectrum disorder (ASD). Our previous research, along with that of others, indicates that Chd8 haploinsufficient mice exhibit genomic, neuroanatomical, and behavioral abnormalities relevant to ASD. However, reported neurodevelopmental phenotypes have varied across different laboratories, with most studies focusing primarily on the development of the pallium/cortex.

Objectives:

This study aims to elucidate the conserved disruptions in forebrain development caused by Chd8 haploinsufficiency using two distinct loss-of-function mouse models. We seek to identify specific cell type alterations and associated transcriptional and epigenetic changes during early neurogenesis, as well as to assess the variability of these effects across different genetic backgrounds. By employing single-cell multiomic approaches, we aim to provide a comprehensive understanding of the molecular pathology linked to CHD8 mutations in the context of autism spectrum disorder.

Methods:

In this study, we address this variability by employing two distinct loss-of-function mouse models of Chd8 haploinsufficiency to identify conserved disruptions in forebrain development associated with reduced Chd8 dosage. We analyzed both pallial and subpallial cell populations at embryonic (E14.5) and early postnatal stages (P2) with single-cell multiomic approaches. We examined cell-type specific differences in abundance, rate of development, differential expression, and differential accessibility in our dataset. Additionally, we examined bulk RNA-seq transcriptional profiles in multiple genetic backgrounds of one Chd8 mouse model to assess broader variability during neurogenesis.

Results:

Our multiomic single-cell findings reveal small to moderate changes in the proportions of pallial progenitors and early-born neurons at E14.5, transitioning to unexpected decreases in glutamatergic neuron proportions and increases in astroglial populations by P2, with a more pronounced effect on subpallial neurogenesis. Our dataset also identified perturbed transcriptional and epigenetic programs in distinct telencephalic lineages and cell types at E14.5 and P2. E14.5 bulk RNA-seq data demonstrated considerable variation across mouse genetic backgrounds, particularly concerning proliferation and neuronal maturation. Incorporation of multiple models and genetic backgrounds allowed us to identify conserved molecular pathology associated with Chd8 haploinsufficiency during early murine development.

Conclusions:

In conclusion, our approach enabled the identification of cell type-specific developmental programs, both shared and background-specific, that are vulnerable to Chd8 haploinsufficiency during mouse telencephalic neurogenesis and forebrain development.

431.191 Computational Electrophysiological Modeling Identifies Voltage-Gated Potassium Ion Channel Modulators for Autism Therapy

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Background: Autism Spectrum Disorder (ASD) is a neurodevelopmental condition that typically becomes apparent in children by the age of three. It encompasses a variety of symptoms, including challenges in social interaction, communication, cognitive functioning, and repetitive behaviors. The underlying causes of ASD are believed to involve a combination of genetic and environmental factors. Abnormal electrical activity in the brain, often linked to genetic mutations, plays a significant role in the development of ASD. Dysfunction of voltage-gated potassium (Kv) channels can lead to hyperexcitability and neurological disorders such as epilepsy, underscoring their importance in regulating electrical activity in the brain.

Objectives: Computational electrophysiology serves as a valuable alternative to traditional experimental methods by simulating the electrical behavior of ion channels at a molecular level, thereby aiding in the understanding of how mutations impact channel function. This study aims to evaluate how Kv ion channels affect action potential generation in dopamine neurons and to explore potential new drug treatments for ASD.

Methods: We have developed a detailed biophysical in silico model to replicate the electrophysiological behavior of a single isolated mouse dopamine neuron. Our model integrates various ionic currents, including L-type and T-type calcium (Ca^{2+}) currents (I_{CaL} and I_{CaT}), sodium-calcium exchange currents (I_{NaCa}), fast and background sodium (Na^+) currents (I_{Na} and I_{bNa}), sustained inward current (I_{st}), ATP-dependent potassium (K^+) current (I_{KATP}), and multiple components of the delayed rectifying potassium current (I_{Kur} , I_{Kr} , I_{Ks}), among others. These neurons are activated by neurotransmitters such as AMPA and N-methyl-D-aspartate (NMDA) receptors, or by direct electrical stimuli.

Results: The steady-state activation curve, current-voltage curve, and currents under the voltage-clamp protocol are generated for the voltage-gated potassium channel currents (I_{Kv}) under control and mutation conditions. Active currents were induced by applying a series of +10 mV voltage steps ranging from -70 mV to 70 mV, each lasting 50 ms, starting from a holding potential of -100 mV. The Kv model is integrated into a single-compartment model of mouse dopamine neurons to simulate action potential generation. To simulate the Kv mutation, the Kv ion channel's maximum conductance is set to zero. The AMPA conductance and NMDA permeability are maintained at their average levels, while the maximum conductances of the other ion channels remain unchanged throughout the simulation. Figure 1 (A) and (B) display the evoked action potential firing patterns of the mouse dopamine neuron model under normal conditions and with a Kv channel mutation. The results suggest that gating pore currents caused by ASD-related Kv ion channel mutations can significantly disrupt neuronal action potential firing, particularly leading to hyperexcitability.

Conclusions: Autism Spectrum Disorder has significant social, medical, and economic impacts worldwide. These complex challenges emphasize the urgent need for enhanced fundamental research to develop new treatments for individuals with ASD. Studying membrane electrical activities and ion channel currents is essential for understanding the disorder's pathophysiology. Findings from our model indicate that targeting specific potassium channel agonists may improve treatment outcomes for autism.



431.192 To Explore the Association of Heavy Metals and Essential Micronutrients As Environmental Markers in Children with Autism Spectrum Disorder: A Cross Sectional Study.

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Background:

Heavy metals have been suggested to play a role in the etiology of Autism Spectrum Disorder (ASD) through epigenetic mechanisms. Previous research has highlighted the potential link between heavy metal exposure and epigenetic rewiring in ASD. Further, DNA structural variations like CNV, insertions, and deletions also play a decisive role in disease susceptibility and outcome.

Objectives:

To analyze the levels of heavy metals and essential micronutrients in blood, urine, hair and nail of children with Autism Spectrum Disorder (ASD) and their comparison with control population. Genomic and Epigenomic alterations were also interrogated to establish the molecular link between metal toxicity and genomic changes contributing to disease phenotype.

Methods:

In this cross-sectional study, children aged 18 months to 18 years fulfilling Diagnostic and Statistical Manual of Mental Disorders 5th edition criteria for ASD were included. Those with a known micronutrient deficiency, on chelating agents, on exclusion diet or with chronic systemic diseases were excluded. Control group was identified as children with IQ>70 on Malins Intelligence Scale for Indian Children and absence of any behavioral problems. Twenty-one heavy metals and trace elements were assayed using Inductively Coupled Plasma Mass Spectrometry (ICP-MS) in blood, urine, hair and nail. Extraction and isolation of genomic DNA from the ASD samples, followed by bisulfite-mediated conversions, were undertaken to estimate DNA methylation. The modified DNA was then used for the Illumina promoter array. Paired extracted gDNA was used for whole genome SNP analysis to identify the chromosomal variants in ASD using the Illumina Infinium Global Screening Bead ChIP Array harboring 650K SNPs.

Results:

A total of 500 ASD and 100 control subjects were enrolled. Mean age was 5.75 ± 3.19 and 7.31 ± 4.23 years respectively. Analysis of blood (500-ASD, 60-controls) and Urine (250-ASD, 30-controls) for heavy metals was done. Rest of the data is under process and results will be analyzed shortly. The following heavy metals were found significantly in higher levels in blood of ASD vs Control group: **Lead** [49(23.4-75.7) vs 26(11-41) mcg/dl, $P<0.001$], **Arsenic** [2.5(1-4.7) vs 1.5(0.6-1.8) mcg/L, $P<0.001$], **Cadmium** [0.9(0.5-2.2) vs 0.8(0.3-1.4) mcg/L, $P=0.04$], **Manganese** [41.3(13.5-97.7) vs 16(6.9-42.3) mcg/L, $P<0.001$] and **Chromium** [45 (17-92) vs 10 (6-16) mcg/L, $P<0.001$]. **Lead** [$P=0.003$], **Arsenic** [$P<0.001$], **Cadmium** [$P<0.001$] and **Manganese** [$P=0.03$] were also found significantly in different proportions in urine in comparison to controls.

A total 19 ASD subjects underwent methylation study. Results showed 289 hypo and 1132 hyper-methylated promoter CpG in the ASD group. CETNP4, HMGA1, and RPAIN were the most hypermethylation promoters prevalent in ASD. ALOXE3, OXCT1, and GLUD1 were the most hypomethylated promoters. Results also showed significant associations of several SNPs in ASD patients. TAF1 gene (rs9820086) belonging to the Tumour Necrosis Factor Alpha-Induced Protein was significantly associated. It regulates various biological processes, including inflammation, immune response, and neuronal function, thereby indicating a link between heavy metal ions, inflammation, aberrant promoter methylation, and altered gene expression.

Conclusions:

Levels of Lead, Arsenic, Cadmium and Manganese were significantly high in blood of ASD subjects in comparison to controls. Aberrant methylation and specific genomic variants play a role in contributing to ASD.

431.193 Deciphering the Role of High Risk Autism Kinase BRSK2 during Neurodevelopment and Disease.

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Background: Neuronal health heavily relies on protein kinase signaling network which orchestrate the transitions between different stages of neurodevelopment. Aberrant kinase signaling leads to neurodevelopmental disorders, intellectual disability (ID) and autism spectrum disorders (ASD). Brain Selective Kinase 2 (BRSK2) is one such serine/threonine kinase strongly associated with autism. To date 35 de novo mutations have been identified in different regions of BRSK2 genes that cause autism. However, the effect of these mutations remains to be explored. Previous studies in animal models have provided indirect evidence for its functions in cortical development and neuronal polarity. However, BRSK2 remains as a relatively understudied kinase in neuropathogenesis.

Objectives: The goal of this project is to determine the mechanisms through which BRSK2 mediates neurodevelopment and how its ASD-associated mutations contribute to neurodevelopmental disorders.

Methods: To study the effects of ASD mutations on the function of BRSK2, I have generated its expression constructs harboring autism associated mutations through site directed mutagenesis. A combination of in vitro kinase assay and protein structure analysis have been used to check the alteration in catalytic functions of BRSK2 with the mutations. To visualize the localization of BRSK2 and identify the protein domain necessary for its trafficking in the cells, I have performed domain dissection followed by live cell imaging. Currently I am using a chemical-genetics approach to identify the neuronal substrates of BRSK2 during development using IP-mass spectrometry.

Results: My study discovered that all the autism associated point mutations R65Q, E66K, A163V, A158T, G212E, and R258C in the kinase domain of BRSK2 are catalytically deficient. Most of these missense mutations are found to be distorting the conformation of the kinase domain resulting in kinase dead phenotype. Live cell imaging showed that BRSK2 shuttles between a cytoplasmic state and association with the ER under physiological condition. However, depletion of ER Ca^{2+} induces a robust plasma membrane association where BRSK2 is dramatically localized at the ER-PM contact site. Further, domain dissection confirmed that the kinase associated domain has a plasma membrane tether site outlining a critical function of its regulatory domain which modulates signaling pathways in a calcium dependent manner. To discover the neuronal substrates of BRSK2, I have identified that mutating the gatekeeper residue leucine 95 to a smaller amino acid glycine can efficiently utilize bulky ATP analog benzyl ATPyS. This will allow me to covalently capture putative BRSK2 substrates from brain lysate and identify them using mass spectrometry.

Conclusions: With a combination of biochemical, chemical-genetics and molecular biology approaches, this study identifies that loss of catalytic function of BRSK2 due to missense mutations in its kinase domain is the underlying cause for autism in patients. BRSK2 can act as plasma membrane-ER contact site protein with the help of its regulatory domain in a calcium dependent manner. Further, generating CRISPR/Cas9 mediated BRSK2 KO in human induced pluripotent stem cells (iPSC) followed by neuronal differentiation will allow me to investigate the function of BRSK2 during early human neurodevelopment.

431.194 Elucidating the Molecular Function of the Autism-Associated Kinase NUAK1 in Neurodevelopment and Disease

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Background: Dysfunction in kinase signaling is associated with several neurodevelopmental disorders, including autism spectrum disorder (ASD). Three *de novo* mutations in *NUAK1*, which encodes the serine-threonine AMPK-related *Nua* kinase 1 (NUAK1), have been associated with ASD. Heterozygous *NUAK1*^{+/−} mice exhibit ASD-like behaviors, including cognitive impairment and decreased social novelty and sensorimotor gating. NUAK1 is highly expressed in the developing brain, where it regulates axon growth by modulating mitochondrial function. The function of NUAK1 in neurodevelopment depends on its catalytic activity, with pharmacological inhibition of NUAK1 kinase activity resulting in defective axonal and dendritic development. Despite the disease association and developmental role of NUAK1, the direct phosphorylation substrates of NUAK1 are unknown, limiting our understanding of how NUAK1 signaling pathways regulate neuronal development.

Objectives: We hypothesize that NUAK1 regulates neuronal development through phosphorylation of key substrates that mediate axonal and/or dendritic development, and perturbation in this pathway contributes to pathogenesis of ASD. In our study we aim to identify phosphorylation substrates of NUAK1 in the brain, and elucidate how they modulate neuronal development. Further, we aimed to test how ASD-associated *NUAK1* mutations impact its molecular function in neurodevelopment.

Methods: To assay the impact of ASD mutations on the molecular function of NUAK1, I have used *in vitro* kinase assays and confocal imaging of HEK293T and cultured primary rat cortical neurons. To identify direct substrates of NUAK1, I have taken a chemical-genetic approach by mutating the gatekeeper residue of NUAK1 to allow the kinase to utilize bulky, N6-substituted ATPyS analogs. This analog sensitive (AS) NUAK1 can preferentially utilize this bulky ATPyS to specifically thiophosphorylate its substrates in mouse brain lysate. These labeled substrates can then be identified by Western blotting or unbiased mass spectrometry.

Results: I discovered that ASD-associated mutations in NUAK1 differentially affect either its kinase activity or localization, with one mutation, Q433*, causing the protein to be mislocalized to the nucleus even in post-mitotic neurons. Future neuronal studies will elucidate the impact of these mutations on neuronal development. To identify the substrates of NUAK1, I combinatorially screened AS NUAK1 mutants with bulky ATPyS analogs to optimize labeling in mouse brain lysate. Using this optimized system followed by LC/MS, I identified 32 novel, high-confidence substrates of NUAK1. Consistent with published functions of NUAK1, these putative substrates have roles in regulation of splicing, cytoskeletal organization, and neurodevelopment. I have experimentally confirmed two putative substrates, both of which have established roles in maturation of dendritic spines and association with ASD.

Conclusions: In this work, I utilized a multifaceted strategy to interrogate the molecular function of the understudied ASD-associated kinase NUAK1 during neuronal development and define the functional consequences of disease mutations in *NUAK1*. Our work shows that autism-associated mutations in *NUAK1* affect either kinase activity or subcellular localization, suggesting diverse mechanisms by which these mutations contribute to ASD. Our work has facilitated identification of over 30 novel, disease-relevant substrates of NUAK1 in the brain, and validated candidate substrates have strong associations with dendritic development and ASD, underscoring the translational value of this work.

431.195 Elucidating the Role of Autism Risk Gene TAOK2 (thousand and one amino acid kinase 2) in Neuronal Lipid Homeostasis

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Background: Thousand-and-one amino acid kinase 2 (TAOK2) is an autism-associated serine-threonine kinase important for several aspects of neurodevelopment, including axon elongation, dendritic growth, and spine formation. TAOK2 consists of two spliced isoforms, α and β , differing in their C-terminal regulatory domains. TAOK2 α localizes to the endoplasmic reticulum (ER) and mediates the tethering of the ER to the microtubule cytoskeleton. While TAOK2 α is enriched in specific subdomains of the ER, the identity and function of these distinct ER subdomains remain unknown. TAOK2 β on the other hand is a cytoplasmic protein.

Objectives: To understand isoform specific functions of TAOK2 in neurodevelopment using iPSC (induced pluripotent stem cell)-derived neural progenitor cells (NPCs) as a model system.

Methods: Further characterization of TAOK2 α at the ER contact sites was done through co-expression and confocal microscopy. A human TAOK2 KO iPSC line was generated and differentiated into NPCs along with a wild type (WT) line. Comparative quantitative lipidomics was performed to assess the changes in lipid profile between WT vs TAOK2 KO NPCs. Immunoprecipitation mass spectrometry (IP-MS) analysis was performed using the α isoform-specific TAOK2 antibody to better understand the molecular and cellular function of TAOK2 in neuronal lipid homeostasis.

Results: Using confocal microscopy, we found no significant enrichment of TAOK2 α in ER contact sites with mitochondria, lysosomes, and endosomes. However, TAOK2 α co-localized within ER-subdomains that were enriched in lipid synthesizing enzymes CEPT1 and PIS1. Through lipidomics, we discovered that the lipidome was significantly altered in TAOK2 KO neural progenitors. Moreover, through IP-MS, we have identified several proteins that regulate lipid synthesis and transfer as potential interactions of TAOK2 α .

Conclusions: Together, our results suggest that TAOK2 α localizes to specific subdomains within the ER with lipid-associated enzymes and may regulate lipid homeostasis during neurodevelopment. These studies suggest that dysregulation of lipid metabolism may contribute to the etiology of neurodevelopmental disorders.

431.196 Uncovering Cell Type-Specific Impacts of Chd8 Haploinsufficiency on the Transcriptional Landscape of Adult Mouse Cortex

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Background:

Mutations in the CHD8 gene are strongly implicated in neurodevelopmental disorders, including autism and intellectual disability. Mice carrying a heterozygous *Chd8* mutation exhibit genomic, neuroanatomical, and behavioral abnormalities resembling key features of these disorders.

Objectives:

In this study, we aimed to uncover the cell-specific transcriptomic consequences of *Chd8* haploinsufficiency in the adult mouse cortex to better understand its persistent effects in the mature brain.

Methods:

Using single-nucleus RNA sequencing (snRNA-seq) on cortical tissue from both male and female *Chd8* mutant mice, we applied a pseudo-bulk differential expression approach to capture cell-type specific changes in gene expression. High-definition weighted gene correlation network analysis (hdWGCNA) was employed across individual cell populations to identify co-expressed gene modules associated with *Chd8* genotype. Synaptic and nuclear fractionation methods paired with bulk RNA-sequencing were also used to disentangle transcriptional changes between synapses and nuclei.

Results:

Our results revealed striking cell type-specific alterations in gene expression, with layer-specific excitatory neurons displaying a pronounced upregulation of genes linked to RNA processing, translation, and synaptic function. Glial and microglial cells were also notably affected. Additionally, discordant transcriptional signatures were identified between the synapse and nucleus.

Conclusions:

Chd8 haploinsufficiency triggers widespread, yet highly cell-specific, transcriptomic changes in the adult cortex, particularly within excitatory neurons. These findings provide deeper insights into *Chd8*'s role in the mature brain and its impact on transcriptional regulation across different cellular compartments.

431.197 Impact of Possible Interactions between Beta-Catenin, Axin2 and Zeb1 Signaling in the Cortex of BTBR Mouse Model of ASD

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Background: Neurovascular development is a growing area of interest in autism spectrum disorder (ASD) research. Wnt signaling has been implicated in dysregulation of developing blood vessel and neuroprogenitor cell (NPC) communications. Canonical Wnt activation requires active beta-catenin nuclear translocation. Axin2, part of the beta-catenin degradation complex in the cytosol, targets it to degradation, preventing its nuclear translocation. Zeb1, a regulator of WNT signaling, has heretofore not been associated with either abnormal neurovascular development or synaptic pruning.

Objectives: Previous studies in Shank3 KO and VPA mice ASD models report that Wnt hyperactivation with increased glycolysis are sufficient to induce ASD behavior. These data showed increased Axin interaction with the glycolytic enzyme enolase 1 (Eno1) in these ASD mice but whether these occur in BTBR mice is unknown. Beta-catenin, Eno1, Axin2 and Zeb1 (a transcription factor regulating Wnt signaling) have all been identified as proteins of interest in ASD.

Methods:

We assessed beta-catenin, Axin2, Eno1 and Zeb1 expression, subcellular localization and protein interaction in 3 m/o male BTBR mice, an inbred ASD mouse model, and in controls C57Bl/6. Subcellular fractionation (SF) and western blot (WB) (n=3/group), Eno1 immunoprecipitation followed by Axin2 WB (n=3/group), were performed on homogenized cortex, developed using a Bio-Rad ChemiDoc imaging system, and quantified with ImageJ software. RT-qPCR (n=3/group) was performed using mRNA isolated from fresh frozen cortex samples. Data were analyzed using unpaired t-tests, with p<0.05 significance.

Results: WB of SF showed increased nuclear and decreased membrane and cytosol beta-catenin expression in BTBR, with increase nuclear Zeb1 and decreased cytosolic Axin2. These data suggest increased Wnt pathway activity. Less cytosolic Axin2 could target beta-catenin to degradation and increased nuclear Zeb1 may regulate beta-catenin transcriptional activity. Axin2 mRNA significantly increased in the BTBR cortex. Eno1 Immunoprecipitation found levels of Eno1/Axin2 association in BTBR cortex and C57Bl/6. This association, similar to that described in Shank3 KO and VPA models, may suggest that Eno1 binding to Axin2 protects beta-catenin from degradation, enhancing Wnt signaling in BTBR.

Conclusions:

The details of this mechanism are currently unknown. The described data suggest a mechanism by which Zeb1 regulation leads to enhanced WNT signaling. Further studies are needed to fully elucidate this signaling pathway, its impact in neural circuitry including synaptic pruning, and determine its developmental timeline and its cell- plus area-specific characteristics.

431.198 Investigating the Molecular Mechanism of Autism-Associated Kinase PAK1

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Background: P21-activated kinase 1 (PAK1) is a serine-threonine protein kinase with 12 mutations that are strongly associated with autism spectrum disorder (ASD) and intellectual disability. Patients with PAK1 ASD mutations clinically present with developmental delay, macrocephaly, and seizures. Highly expressed in the brain throughout neurodevelopment, PAK1 regulates cortical development by promoting proliferation and migration of neural progenitor cells through cytoskeletal alterations. PAK1 is catalytically autoinhibited through homodimerization in *trans*-conformation, and the binding of Rho-GTPases RAC1 or CDC42 causes PAK1 activation by dimer dissociation. It is hypothesized that the ASD-associated mutations cause overactivation of PAK1 through dimer destabilization and contributes to the autism phenotype through increased actin protrusions and increased neuronal migration. However, the mechanisms by which PAK1 overactivation gives rise to the autism phenotype is unknown, and direct phosphorylation substrates of PAK1 have not been identified.

Objectives: We hypothesize that PAK1 regulates neuronal development through phosphorylation of key substrates and that overactivation of these pathways contribute to the pathogenesis of autism. In our study, we tested how autism-associated mutations impact PAK1 activity and neurodevelopment. We have also identified the neuronal phosphorylation substrates of PAK1 through chemical genetics. We aim to validate the substrates of interest and investigate how they modulate neurodevelopment.

Methods: I have characterized how autism-associated mutations in PAK1 impact its kinase activity using *in vitro* biochemical assays. In addition, I used high resolution confocal microscopy to determine the impact of disease mutations in PAK1 on its subcellular localization. To identify the direct substrates of PAK1, I have applied a chemical genetic approach by mutating the gatekeeper residue of PAK1 to allow the kinase to utilize bulky N6-substituted ATPγS analogs. This analog sensitive kinase was able to utilize phenyl-ATPγS to specifically thiophosphorylate its substrates in mouse brain lysate that were then identified through unbiased mass spectrometry.

Results: Using *in vitro* kinase assays, I determined that the full-length wild type PAK1 exhibits a low level of kinase activity due to its autoinhibited state. In the full-length PAK1, I then generated selected autism-associated mutations and determined that the mutations increase PAK1 kinase activity compared to wild type, suggesting a trend of PAK1 overactivation. Despite this overactivation of PAK1 with autism-associated mutations, the substrates of PAK1 are not known. To determine the substrates, I used a chemical genetic approach to identify 98 putative PAK1 substrates in the mouse brain. Consistent with published PAK1 functions in actin organization and cellular migration, the putative substrates have roles in cytoskeletal rearrangement and neuronal development. Identified substrates will be tested for phosphorylation by recombinant PAK1 with *in vitro* kinase assays.

Conclusions: In this work, I have utilized a multifaceted strategy to investigate the molecular function of an understudied autism-associated kinase PAK1 and define the functional consequences of disease mutations. These studies have elucidated the trend of overactivation seen in PAK1 autism mutations, further underscoring the importance of identifying phosphorylation substrates of PAK1 in the brain. We will uncover the mechanisms by which PAK1 contributes to neurodevelopment, which will have translational value for neurodevelopmental disorders.



431.199 Investigating the Role of Tbc1 in Rare Neurological Disorder

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Background: TBC domain containing kinase (TBCK) is an understudied protein with three domains: a pseudokinase; Tre-2, Bub2, and Cdc16; and rhodanese, and is highly expressed in the brain. Homozygous mutations in TBCK cause a rare neurodegenerative disorder in children, which clinically presents as syndrome infantile encephalopathy, brain atrophy, cerebellar hypoplasia, and muscle hypotonia. Two mutations in particular, R126Ter and R511H in the pseudokinase and TBC domains respectively, are commonly found among TBCK patients. The progression of the disease is characterized by a global regression in brain development, severe intellectual disability, and premature death in acute cases. The pathogenic mechanism underlying TBCK syndrome is unclear, but past studies show that TBCK patient neurons show abnormal lipofuscin deposits likely resulting from abnormal lysosomal activity.

Objectives: TBCK knockdown has also been shown to decrease mTOR activity and cytoplasmic translation. De novo homozygous and compound heterozygous mutations have been found throughout the protein. We have generated CRISPR-edited Human iPSCs with the aim of investigating how mutations in TBCK impact lysosomal storage and function, neurodevelopment, and the molecular mechanisms of the pseudokinase.

Methods: We used CRISPR site-directed mutagenesis to generate intellectual disability (ID) associated mutations in TBCK in iPSCs. An in vitro kinase assay was used to confirm the pseudokinase status of TBCK and its lack of ATP hydrolase activity. Mass Spectrometry was used to determine the interactors of TBCK, as well as the lysosomal contents of CRISPR-edited TBCK iPSC-derived Neural Progenitor Cells (NPCs).

Results: TBCK lacks critical residues in its kinase domain for catalytic activity. Through in vitro kinase assay, we found and confirmed the inability of TBCK to utilize ATP for phosphorylation. Through immunoprecipitation coupled with mass spectrometry, we pulled down known interactors like PPP1R21 alongside novel interactors.

Conclusions:

We have determined that TBCK is an inactive kinase, and it is known to be critical to proper lysosome function. These novel human TBCK mutant cell models will be utilized moving forward to determine morphological discrepancies in neurons post differentiation as well as analyze changes in lysosomal function and storage.

431.201 Microglia-Astrocyte Crosstalk during Activity-Dependent Synaptic Remodeling

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Background: Synapses remodel in response to changes in sensory experience and neural activity. Microglia and astrocytes both contribute to activity-dependent synapse remodeling by removing synapses from less active neurons. Yet, how microglia and astrocytes communicate to remodel synapses remains an open question. Previously, our lab showed that microglia engulf and remove synapses in neonate mouse barrel cortex following whisker lesioning and whisker trimming-induced reductions of neural activity. Whisker lesioning-induced synapse removal was dependent on signaling between neuronal fractalkine (CX3CL1) and its cognate microglial fractalkine receptor (CX3CR1).

Objectives: Using this whisker lesioning paradigm, the investigators explored how astrocytes and microglia coordinate to regulate synapse remodeling

Methods: Using translating ribosome affinity purification followed by RNA-seq (TRAP-seq) and MERFISH spatial transcriptomics, the investigators identified novel Wnt-dependent receptor-ligand signaling between microglia and astrocytes that drives synapse remodeling.

Results: Intriguingly, microglia-to-astrocyte Wnt signaling is CX3CR1-CX3CL1 signaling dependent and induces reduced astrocyte-synapse contact prior to synapse engulfment by microglia. Together, these results identify a novel mechanism by which microglia signal to astrocytes to facilitate synapse engulfment and remodeling of cortical synapses in response to changes in sensory experience.

Conclusions:

As changes in astrocyte-synapse contact occur naturally during sleep, as circuits mature, and in an array of neurological disorders, it is proposed that astrocyte-synapse contact could be a general regulator of microglial synapse engulfment and subsequent synapse remodeling. I am now actively exploring this possibility by examining how other manipulations that affect astrocyte-synapse contact impact developmental critical windows.

431.203 Profiling of Metabolites for Autism Spectrum Disorder By Metabolome Analysis

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Background: Autism Spectrum Disorder (ASD) is a disorder with a wide variety of symptoms, including impairment of social interaction, repetitive and restricted behaviors. Many omics studies explored genetic and metabolic biomarkers for ASD, but none of them have been put to practical use. Unfortunately, these studies could not discover a definitive, valid, and available biomarker due to various factors depending on individual differences such as symptoms, race, sex, and age.

Objectives: Metabolome analysis was carried out assuming that there must be substances that could be biomarkers under limited conditions in this study. We also hypothesized that there might be some metabolite that is related to some characteristics of ASD.

Methods: Subjects were recruited from the Hirosaki Five-year-old Children Developmental Health Check-up study between 2013 and 2018, with informed consent after approval by the Research Ethics Committee of Hirosaki University (approval number: 2013-293). Blood samples were collected from community-based 5-year-old children in Japan (healthy control: 41 males and 25 females, patients with ASD: 80 males and 38 females) and subjected to target-metabolome analysis. Target-metabolome analysis was performed using AbsoluteIDQ® Kit p180kit (Biocrates Life Sciences AG) in accordance with manufacturer's instructions. The amounts of 188 metabolites including amines, acylcarnitines, and lipids in plasma were measured by mass spectrometry and analyzed using MetaboAnalyst.

Results: Several metabolites were observed to have significant differences in blood concentration. One of the acylcarnitine, dodecanedioylcarnitine (C12-DC), was significantly higher in patients with ASD (120.0 ng/ml, 95% CI: 113.3-126.7 ng/ml) than in healthy subjects (83.1 ng/ml, 95% CI: 78.4-87.8 ng/ml) ($P = 4.2179 \times 10^{-11}$, fold change = 1.42) and have no differences between sex. Receiver operating characteristic (ROC) curve analysis determined that the sensitivity and specificity were 77.2% and 71.2%, respectively (cutoff = 82.8 ng/ml). In addition, although the average concentration of C12-DC was higher than the control group, there was a tendency to be divided into a high group and a low group. A positive correlation was found between the concentration of C12-DC and the Autism-Spectrum Quotient (AQ) score ($r^2 = 0.551$, $P < 0.001$). Especially, the score of local details was the medium correlation ($r^2 = 0.595$, $P < 0.001$). C12-DC is known to be detected in blood at high levels in oxidative stress and mitochondrial damage. Since oxidative stress and mitochondrial damage are also known to occur in patients with ASD, the increased blood levels of C12-DC may be due to these factors.

Conclusions: We showed that the blood concentration of C12-DC was significantly higher in the ASD group. A positive correlation was found between the concentration of C12-DC and the Autism-Spectrum Quotient (AQ) score. Thus, C12-DC may be a potential biomarker for diagnosing ASD.

431.204 Protein Interactions of Chd8 in Mouse Forebrain

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Background: Autism spectrum disorder (ASD) is a neurodevelopmental disorder (NDD) characterized by social and communication difficulties. Genome sequencing has enabled the identification of a growing number of risk genes for NDDs. Among these NDD risk genes, chromatin associated factors have emerged as among the most strongly enriched loci and have been shown to have a strong causal association in humans via *in vitro* and animal studies. Chromatin remodelers canonically regulate chromatin dynamics via modulating nucleosome spacing and cooperating with transcription factors and histone modifiers to allow the transcription of DNA. One such chromatin remodeler, Chromodomain helicase DNA binding protein 8 (*CHD8*), has among the highest observed *de novo* loss-of-function mutations rates in patients with ASD. *CHD8* has been shown to regulate the transcription of other ASD risk factors and *Chd8* mutation or knockdown has broad transcriptional impact.

Objectives: Despite its status as a top risk gene, molecular mechanisms linking *CHD8* haploinsufficiency and ASD are poorly understood. To address this, we aim to identify *Chd8* molecular interactions in developing mouse forebrain.

Methods: Proteins interactors were identified by endogenous co-immunoprecipitation followed by Liquid Chromatography with Tandem Mass Spectrometry (LC-MS/MS). Interactions were verified via proximity ligation analysis and CoIP followed by western blotting. We further used RIP-seq to test for RNA interactions and bulk RNA sequencing to test for transcription differences in *Chd8*^{-/-} mutant mice.

Results: We observed a substantial number of interactions implicating chromatin remodeling and epigenetic factors, transcriptional machinery, and cytoskeletal proteins, with a surprisingly strong enrichment for proteins involved in RNA processing. RIP-seq of *Chd8* provides some support for links between *Chd8* genomic and mRNA targets. Finally, we found perturbations in splicing in perinatal forebrain in *Chd8*^{-/-} mutant mice. Further validation experiments of these *CHD8* molecular interactions are ongoing.

Conclusions: Overall, identifying these *Chd8* interactions will more comprehensively define the roles of *Chd8* in the brain, open new avenues of research, and further understanding of molecular mechanisms in ASD.

431.205 Single-Cell Analysis of B Cell Landscape Underlying Behavioural Heterogeneity in ASD and ADHD

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Background: An estimated 10% of Canadian children are diagnosed with neurodevelopmental disorders (NDs) such as autism spectrum disorders (ASD) and attention-deficit/hyperactivity disorder (ADHD). Clinical heterogeneity in NDs makes it difficult to match individuals with effective treatments. Within the disorders, heterogeneity in behavioural phenotype (e.g., social communication, anxiety) and gut abnormality (e.g., constipation, diarrhea, reflux) is common and may be related to differences in the underlying biological mechanisms and treatment responses. Immune dysregulation has been widely reported in NDs and may serve as a link between the gut-brain axis, underlying clinical heterogeneity. We leveraged blood samples and clinical data acquired through the Province of Ontario Neurodevelopmental Disorders (POND) network, a multidisciplinary team of scientists, clinicians, and community stakeholders. In agreement with published literature, a nested analysis of 1130 of the total 1727 participants demonstrated that increased GI symptoms was associated with increased severity of behavioural symptoms. Notably, in individuals (20% ADHD, 80% ASD) that presented with behavioural deficits across all domains, half of these individuals had at least one GI symptom with 25% of those having multiple GI symptoms. The POND network has banked biospecimens from 654 participants, including typical developing, ASD and ADHD that were transdiagnostically clustered into behavioral groups with distinct behavioral score and co-occurrence of GI symptoms.

Objectives: Investigate the molecular network underlying the peripheral B cell dysregulation associated with GI dysfunction and behavioural heterogeneity

Methods: A proof-of-concept pilot single cell RNA sequencing analysis was performed to reveal the transcriptome state of immune cells from banked PBMCs of 15 male individuals aged 8 to 17 across behavioral clusters with varying frequency of GI symptoms including 3 typical developing (TD), 6 ASD and 6 ADHD individuals (3 per disease group with severe social communication deficit and increased GI symptoms).

Results: Comparing disease and healthy groups, ASD individuals had higher frequency of B cells than TD. ADHD individuals had more regulatory B cells with upregulation of NR4As and TCL1A as compared to ASD. Within B cell subtypes, both naive and memory B cell levels were lower in ASD and ADHD compared to TD, while frequency of transitional B cells was higher in both disease groups. B cells were more activated in individuals with severe social communication deficit and increased GI symptoms trans-diagnostically, but the activation is heterogenous. In ASD, B cell activation, reflected by more significant MHC class II antigen presentation, was associated with selected HLA subtypes (HLA-DQA2 and HLA-DRB5) in individuals with increased GI symptoms. In contrast in ADHD, individuals with increased GI symptoms were associated with NF- κ B activation.

Conclusions: B cell functional state underlies behavioral heterogeneity trans-diagnostically in ASD and ADHD. We will further validate the preliminary results leveraging more banked PBMCs from POND by scRNA-seq and flow cytometry. The biological mechanisms will enable us to identify blood-based biomarkers that can be used to stratify individuals into clinically relevant subgroups to better inform treatment.

431.206 Children with Autism Spectrum Disorder Have Low Level Neurotransmitter Alterations in Intestinal Enteroendocrine Cells
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Background: Emerging evidence supports a strong bidirectional relationship between the gastrointestinal system and the central nervous system, referred to as the gut-brain axis. While neurotransmitter dysregulation and synaptic dysfunction have been well-documented in the brains of individuals with autism spectrum disorder (ASD), less is known about how these molecular changes manifest in the gut. In this study, we analyzed biopsies from the ileum and colon of typically developing (TD) children and individuals with ASD to assess the expression of genes involved in neurotransmission in the gastrointestinal tract.

Objectives: To evaluate differential neurotransmitter-related gene expression in biopsies from the ileum and ascending colon of TD and ASD pediatric patients with or without inflammation.

Methods: Gastrointestinal biopsy tissues from our large tissue repository (N=1400 children with ASD; 250 TD children) were selected for comparative analysis of neurotransmitter-associated gene expression. Biopsies from the terminal ileum (TI) and ascending colon from GI-symptomatic children with (ASD only, n=10), and without (ASD n=9; TD n=9) inflammation were selected for analysis. Total RNA was isolated from each sample using RNeasy kit reagents (Qiagen) following the manufacturer's protocol, and RNA quantity and quality were assessed using an Agilent Bioanalyzer (ThermoFisher). Total RNA (0.5–2.0 μ g; RIN $\geq$ 7) from each sample was assayed on Illumina HT v4 BeadArray whole-genome microarrays (Illumina Inc.) and data were extracted using Genome Studio Software (Illumina Inc.) and prepared for further gene expression analysis. The genes of the enteroendocrine cell lineage and neurotransmitter pathways were identified based on recent published single-cell RNAseq data of the normal human small and large intestine.

Results: Genes associated with serotonin signaling (*HTR1F*, *HTR7*, *SLC6A4*) (**Figure 1**), dopamine synthesis and receptor function (*DDC*, *DRD5*), and glutamatergic pathways (*GRIK3*, *GRIN1*, *SLC1A1*, *SLC1A7*) were significantly altered in ASD children with inflammation, suggesting a broad disruption in neurotransmitter homeostasis in the gut (**Figure 2**). Additionally, neuropeptide Y (NPY), PAX6, and endothelin-2 (EDN2) were also downregulated, further implicating altered neuroimmune interactions and developmental pathways in gut tissues.

Conclusions: We identified several neurotransmitter pathways that are altered in the ASD gut, particularly in the setting of inflammation. These findings highlight the potential role of the gut as a critical modulator of neurodevelopmental processes in ASD and suggest that gut-brain axis dysregulation may contribute to the ASD phenotype. This study provides new insights into the molecular mechanisms in the gastrointestinal tract in individuals with ASD and suggests novel therapeutic targets for restoring gut-brain communication. This research opens new avenues for therapeutic strategies targeting the gut-brain axis in autism.



431.207 Creating a Living Intestinal Organoid Biobank: A Model System for Mechanistic Testing in GI-Symptomatic Children with Autism

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Background: Persistent gastrointestinal (GI) symptoms are common in children with autism spectrum disorder (ASD) and despite growing evidence linking gut dysbiosis and chronic gut inflammation in these children, the underlying mechanisms remain incompletely understood. To address this, we propose the creation of a model system that can be used for hypothesis testing and mechanistic studies. We hypothesize that gut organoids generated from individual patient-derived gut tissues will recapitulate important disease-driving characteristics of the host.

Objectives: To establish a robust platform that enables the discovery of ASD patient-specific mechanisms underlying GI dysfunction and supports the design of targeted treatments based on the unique molecular and cellular profiles of individual patients.

Methods: *Biobanking:* Biopsy samples from the distal duodenum, terminal ileum (TI), and right colon were collected from ASD and TD children undergoing clinically indicated endoscopy. Intestinal crypts were isolated through enzymatic digestion, embedded in Matrigel basement membrane extract, and cultured in Intesticult growth medium (StemCell Technologies) supplemented with RHO/ROCK pathway inhibitor (10 uM) and gentamicin (50mg/ml). Organoids were expanded through multiple passaging before being transferred to liquid nitrogen for cryopreservation.

Experimental: To test the organoid exposure response to a proinflammatory stimulus (flagellin), a small pilot study was performed using TI organoids from 4 ASD patients. Cryopreserved organoids were thawed, passaged twice, and cultured in differentiation medium (StemCell Technologies) for 4-5 days prior to stimulation. For the stimulation experiment, 1 µg/ml flagellin was added to media and organoids were incubated at 37°C with 5% CO₂. Following a 20 h incubation, the supernatants were collected and assayed for IL-8 (a proinflammatory marker).

Results: To date, we have successfully generated, expanded, characterized, and banked 52 organoids from individual mucosal biopsy samples; 38 from ASD and 14 from TD children. We were able to expand 70% of the ASD and 78% of the TD organoids. No significant differences were observed between ASD and TD controls in average time for expansion (14 days from primary culture to the first passage and 7 days from passage 1 to passage 2). H&E staining showed that both groups exhibited similar morphologies. Differentiated ASD organoids were positive for key gut cell markers, including lysozyme, villin, MUC2, and chromogranin A, indicating successful differentiation (**Figure 1**). Following stimulation with flagellin, ASD organoids showed increased IL-8 secretion, indicating retention of response to proinflammatory activity under *in vitro* conditions (**Figure 2**).

Conclusions: These results confirm the feasibility of generating and cryopreserving ASD-specific organoids without compromising their viability, demonstrating their suitability for experimental studies. We have shown that ASD organoids develop similarly to TD organoids and can mimic *in vivo* responses to bacterial stimuli. To our knowledge, this biobank is the first to generate ASD patient-specific organoids from distinct regions of the GI tract, providing an important new platform for mechanistic testing and evaluation of personalized treatment approaches in ASD research. Further characterization of this organoid model system is ongoing.



431.208 Gene Expression Analysis in Patient-Derived Gut Organoids from Autistic Children with Chronic Gastrointestinal Symptoms

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Background: Children with autism spectrum disorders (ASD) experience a range of chronic gastrointestinal (GI) problems for which the underlying etiology and pathophysiology are not well understood. One hypothesis suggests that a damaged gut mucosa, resulting in a 'leaky gut', may be partially responsible. To investigate this hypothesis, we are developing a three-dimensional gut organoid model system that utilizes mucosal biopsy tissues derived from children with ASD and chronic GI inflammation.

Objectives: To analyze differential gene expression in gut organoids generated using biopsy tissue from GI- symptomatic children with ASD compared to typically developing (TD) control organoids (from GI-symptomatic children *without* ASD) with the overall goal of enabling the eventual characterization of intestinal epithelial barrier status and mechanistic hypothesis-testing.

Methods: Two biopsies from the terminal ileum were collected from GI-symptomatic ASD children undergoing a clinically indicated ileocolonoscopy. One biopsy was placed in RNA later (stored at -20°C) and a companion (adjacent) biopsy was used to generate gut organoids. Organoids were cultured, expanded, and banked in liquid nitrogen. Cryopreserved GI organoids from typically developing (TD) children (provided from a collaborator at UC Davis) served as controls. Total RNA from both organoids sets (N=4 ASD; N=4 TD), and biopsy tissue from the original ASD donor (N=4) was isolated using the QIAcube (QIAGEN®) instrument. Following RNA isolation and quality assessment, gene expression was analyzed using a gene expression panel (Nanostring) consisting of 241 inflammation-related genes. Differential expression analysis was performed using NSolver software for the following two comparisons: (1) ASD organoids versus TD organoids, and (2) ASD organoids versus ASD biopsy tissues used in the organoid creation (i.e., matched by donor). The list of differentially expressed transcripts (DET) from each comparison were exported to Ingenuity Pathway Analysis (IPA) software wherein canonical pathways and interaction networks were identified.

Results: In comparison #1 (ASD organoids versus TD organoids) 134 DETs were identified, and pathway analysis included 49 analysis-ready molecules across observations; 42 were downregulated and 7 were upregulated. The transcription regulator NFκB was down regulated in *PPAR* and *Tight Junction Signaling* pathways. DAXX, another transcription regulator was downregulated in the *P38 MAPK signaling* pathway. In comparison #2 (ASD organoids versus donor biopsy tissue) 193 DETs were identified and of the 131 analysis-ready molecules, 6 were downregulated and 125 were upregulated. Transcription regulator NFκB1 was upregulated on PPAR signaling. In P13K/AKT signaling, another pathway implicated in leaky gut, a multifunctional anti-apoptotic protein BCL-XL, involved in epithelial cell proliferation, was downregulated. The highlighted DETs are associated with functions of the activation of protein kinase, apoptosis, transcription regulation, epithelial neoplasia, and inflammation suggesting that these pathways are likely relevant to epithelial barrier integrity (**Table 1, Figure 1**).

Conclusions: These results provide evidence of differences in inflammatory-related gene expression between gut organoids derived from GI-symptomatic children with ASD compared to controls that may contribute to functional alteration of the intestinal epithelial barrier. A more comprehensive characterization of this organoid model system is currently underway.



431.209 Using a Robust Organoid Model System to Analyze Serotonin Signaling in Gastrointestinal (GI) Symptomatic Children with Autism Spectrum Disorder (ASD)

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Background: Serotonin signaling plays an important role in homeostasis within the microbiota-gut-brain axis, and dysregulation within this axis has been identified as a potentially important component in the etiology of autism spectrum disorder (ASD) symptoms. Enterochromaffin cells located throughout the intestinal epithelium of the small and large intestines produce intestinal serotonin, yet no study to date has analyzed potential dysregulation of the serotonin signaling pathway across different regions of the GI tract in children with ASD. In this study, we propose to use a robust tissue-derived intestinal organoid model, generated using gut mucosal from ASD and typically developing (TD) GI-symptomatic children, to analyze serotonin signaling pathway dysregulation.

Objectives: To compare the levels of serotonin pathway-related genes and proteins in patient-derived organoids from children with ASD vs. TD control and analyze serotonin expression in ASD organoids generated from the small and large intestines.

Methods: Biopsy samples from the distal duodenum, terminal ileum, and right colon were collected from ASD and TD children undergoing clinically indicated endoscopy and used to create organoids. Briefly, intestinal crypts were isolated through enzymatic digestion, embedded in Matrigel basement membrane extract, and cultured in Intesticult growth medium (StemCell Technologies), supplemented with RHO/ROCK pathway inhibitor (10 uM) and gentamicin (50 mg/ml). Following expansion and passaging, organoids were transferred to liquid nitrogen for cryopreservation. *Experiment 1:* Selecting from the cryopreserved biobank samples, organoids derived from terminal ileum were thawed, passaged twice, and cultured in differentiation medium (StemCell Technologies) for 4-5 days. Next, total RNA (N=6 ASD; N=6 TD) was isolated using the QIA cube (QIAGEN®) instrument and standard protocols. Following RNA isolation and quality assessment, gene expression was analyzed using qPCR. *Experiment 2:* To assess the secretion of serotonin (ASD samples only), monolayers were generated from organoids of the distal duodenum (N=3) and right colon (N=3) and exposed to 1 µg/ml flagellin for 20 hrs. Supernatants were then assayed using serotonin ELISA.

Results: qPCR results revealed no significant differences in serotonin transporter (SERT) expression between ASD and TD control at baseline, however ASD organoids were found to have increased expression of tryptophan hydroxylase 1 (Tph1), the rate-limiting enzyme involved in serotonin biosynthesis, relative to TD controls (**Figure 1**), indicating that serotonin biosynthesis may be upregulated in ASD. Monolayers derived from colon organoids exhibited higher serotonin levels when compared to monolayers derived from the distal duodenum organoids (**Figure 2**), however treatment with flagellin did not change the serotonin levels in either location, suggesting that flagellin does not enhance serotonin production in this organoid model.

Conclusions: These data support the notion that these organoids can serve as a valuable model for investigating serotonin synthesis and signaling in children with ASD. The observed dysregulation of key serotonin-related genes, such as tph1, suggests an increased in serotonin production as a potential pathological mechanism in ASD. The next steps will involve comparative molecular analysis between these organoids and patient biopsy tissue to further validate these findings.

**Poster Session****432 - Sensory, Motor, and Repetitive Behaviors and Interests II**

May 2nd, 2025, 6:00 PM - 7:00 PM - Hall 4A

432.210 Differences in Neurophysiological and Behavioral Habituation and Sensory Reactivity Patterns in Autistic Children

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Background:

Habituation, the reduction in response to a repeated stimulus, has a crucial role in learning and cognitive development (Sicard-Cras et al., 2022). Studies have found reduced neurophysiological habituation in autistic children, and this reduced habituation has been linked to sensory reactivity patterns (Cary et al., 2023; Donkers et al., 2015; Hudac et al., 2018). Differences in behavioral manifestation of habituation have also been examined, with studies suggesting that autistic children orient/respond less to a repeated stimulus compared to non-autistic children (Baranek et al., 2007). However, the relationship between neurophysiological and behavioral habituation and how behavioral habituation is associated with sensory reactivity patterns remains unknown. We hypothesize that autistic children who do not exhibit *behavioral* habituation will also demonstrate diminished *neurophysiological* habituation.

Objectives:

Examine how neurophysiological habituation and sensory reactivity patterns differ as a function of behavioral habituation classifications in autistic children.

Methods:

As part of a larger study, 70 autistic children participated ($M_{age}=4.14$, $SD=.87$). **Neurophysiological habituation** was derived from a 100-trial Paired-Click Electroencephalogram (EEG) paradigm. EEG data was recorded using an EGI 124-electrode system. Data were analyzed using standard ERPLab functions to clean and derive the P50 and N100 components. **Behavioral habituation** was assessed with the habituation task on the Sensory Processing Assessment for Young Children (SPA; Baranek et al., 1999). In the habituation task, a phone rings ten times (with ten seconds between rings) while the child is engaged with another toy. Responses were categorized into three classifications: 1. Habituator-child shows three consecutive nonresponses after a response; 2. Nonresponder-child did not respond to any of the ten trials; 3. Hyper-responder-child responds to at least five of the ten trials. Overall sensory hypo- and hyper-reactivity patterns were also calculated from the SPA. A series of general linear models (GLM) were used to examine the differences in both the P50 and N100 amplitudes, as related to sensory reactivity patterns between the three habituation classifications.

Results:

The GLM revealed a significant main effect of *behavioral* habituation classifications ($F(2,61)=3.83$, $p=.027$), with higher hypo-reactivity scores in the Nonresponders group ($M=2.92$) than in the Habitulators group ($M=2.21$; $t(63)=-2.74$, $p=.008$). Another significant main effect for *behavioral* habituation classification was found ($F(2,61)=3.59$, $p=.033$), with higher seeking scores in the Hyper-responders group ($M=2.91$) than in the Habitulators group ($M=2.26$; $t(63)=-2.21$, $p=.031$). For *neurophysiological* habituation, there was a marginal effect ($F(1,31)=4.13$, $p=.051$), with smaller N100 amplitude in the left hemisphere for Nonresponders ($M=5.17$) compared to Habitulators ($M=-.54$; $t(32)=-2.03$, $p=.051$). No significant differences were found with the P50 component ($ps > .39$).

Conclusions:

Autistic children with increased hypo-reactivity showed differences in both behavioral and neurophysiological habituation, possibly due to impaired sensory stimuli registration—potentially caused by decreased sensory gating. These findings highlight the importance of exploring neurophysiological mechanisms to explain processing differences that result in similar behaviors. Notably, only children who did not show behavioral habituation showed reduced neurophysiological habituation, suggesting the relationship between neurophysiological and behavioral habituation may be influenced by other factors. Future analysis will examine factors such as cognitive functioning and attention.

432.211 Temperamental Sensory Features in the First Years of Life Predict Later Autistic Traits

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Background:

Differences in responses to sensory stimuli (i.e., sensory reactivity) are tightly linked to autistic traits, such as restricted and repetitive behaviors (RRB; e.g., Boyd et al., 2010). Prospective studies have shown that differences in sensory responses at ages 6-23 months predict higher levels of autistic traits at 3-7 years (Grzadzinski et al., 2020; Chen et al., 2022). Additionally, sensory reactivity is associated with temperamental features in autistic and non-autistic 2-7 years old children (Keuler et al., 2011; Brock et al., 2010). Studies with infants at increased likelihood for autism show that temperamental negative affect, effortful control, and surgency early in infancy and toddlerhood predict autism outcomes at 3 years of age (Pijl et al., 2019, Garon et al., 2015). The current study will expand on past work and examine whether early temperamental sensory features predict variation in a community sample of infants.

Objectives:

To examine whether sensory features in the first and second year of life, derived from traditional temperament measures, can predict autistic traits at 3 years of age.

Methods:

As part of a longitudinal study, caregivers of 59 infants from a community sample completed questionnaires about their child's temperament at one or more time points between 6 and 24 months and then completed the Social Responsiveness Scale, Second Edition (SRS-2; Constantino & Gruber, 2012) when their child was 36 months. For 6- to 12-month temperament, the Infant Behavior Questionnaire (IBQ; Rothbart, 1981) was used; for 18- to 24-month temperament, the Early Childhood Behavior Questionnaire (ECBQ; Putnam et al., 2006) was used. Standard temperament scores on the IBQ included Activity Level, Distress to Limitations, Approach Distress, Duration of Orienting, and Smiling and Laughter, and on the ECBQ included Negative Affect, Surgency, and Effortful Control. Additional sensory composite scores were derived for both the IBQ and ECBQ, combining items spanning the standard subscales that correspond with sensory items from the Sensory Experience Questionnaire (SEQ; Baranek et al., 2006). For autistic traits, total t-scores as well as Social-Communication Index (SCI) and RRB t-scores were calculated.

Results:

Linear regression models predicting SRS-2 scores from IBQ and ECBQ standard subscales showed that Negative Affect and Effortful control on the ECBQ predicted total ($p < .018$), RRB ($p < .045$), and SCI ($p < .030$) t-scores on the SRS-2. The newly-derived sensory composite from the ECBQ also predicted total ($p = .007$), RRB ($p = .026$), and SCI ($p = .005$) t-scores on the SRS-2. For IBQ, regression showed that none of the IBQ standard subscales predicted autistic traits ($p > .13$); however, the newly-derived IBQ sensory composite score predicted RRB scores ($p = .04$). See Table 1 for a full summary.

Conclusions:

Findings suggest that while standard measures of temperament in the second year of life predict autistic traits at age 3, a novel sensory composite measure in the first year was able to predict restricted and repetitive behaviors (RRB) at age 3. This highlights sensory features as an early behavioral marker of autistic traits. Future analyses will explore the developmental trajectories of these temperamental sensory traits in relation to later autistic features and clinical outcome.



432.212 Patterns of Anxiety and Specific Repetitive Behaviors in Autism Spectrum Disorder and Williams Syndrome

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Background:

Repetitive behaviors (RRBs) and anxiety are common in both Autism Spectrum Disorder (ASD) and Williams Syndrome (WS) (Rogers et al., 2012; Glod et al. 2019). In ASD, RRBs often function as coping mechanisms for sensory overload, unpredictability, and heightened stress, while anxiety tends to exacerbate and reinforce the need for these behaviors, creating a cycle of dependence (Boulter et al., 2014; Lewis & Kim, 2009; Rodgers et al., 2012). Similarly, individuals with WS also exhibit RRBs that may serve as coping strategies for social challenges and heightened anxiety (Glod et al., 2019). However, there remains a gap in understanding how anxiety differentially relates to RRBs across ASD and WS.

Objectives:

This study aims to compare the frequency and types of repetitive behaviors in children with ASD and WS and how these are associated with anxiety within each group.

Methods:

Our research utilizes a subsample from a larger international data set of individuals with special needs collected during the initial stages of the COVID-19 pandemic (Dukes et al., 2021). The current study uses data from caregivers of children with ASD and with WS within the United States, collected via an investigator created survey, which retrospectively measured parent-rated concerns (on a scale of 1=not at all to 5=extremely) before and during the pandemic.

Our sample includes 249 participants aged 5 to 16, with a mean age of 10.32 years (SD=3.42): ASD (N=189, 83% male) and WS (N=60; 45% male). There was no significant difference in age between the two groups: ASD (M=10.22; SD=3.45) and WS (M=10.63; SD=3.33).

Results:

Independent samples *t*-tests were conducted to compare anxiety and RRB levels between children with ASD and WS (see Table 1). Results suggested that there was no significant difference in anxiety levels between children with ASD and WS. However, children with ASD exhibited significantly higher levels of all repetitive behaviors compared to children with WS.

Spearman's rank order correlations were computed to assess the relationship between anxiety and RRBs in the ASD and the WS (see Table 2) groups. In the ASD group, anxiety was significantly correlated with all repetitive behaviors except Food Selectivity while in the WS group, only Routine Sameness, Perfectionistic Behaviors, and Clothing Rigidity were correlated with anxiety.

Conclusions:

Children with ASD exhibited higher levels of repetitive behaviors than those with WS, although anxiety levels were similar between the two groups. Anxiety was also positively, but differentially, associated with RRBs across both groups. These findings contribute to a growing body of literature that emphasizes the importance of targeting both anxiety and repetitive behaviors in therapeutic interventions; reducing anxiety may have a cascading effect on decreasing the severity or frequency of repetitive behaviors, potentially improving quality of life. Information about differences in the patterns of RRB and their association with anxiety across ASD and WS may also inform the development of more tailored therapies for these two groups.

**432.213 Patterns of Self-Injurious Behavior in a Cohort of Children with Autism: From Preschool to School Age**

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Background: Self-injurious behavior (SIB) is a relatively common behavior with estimates indicating that approximately half of autistic children will engage in SIB within their lifespan (Duerden et al., 2012). For a subset of children, SIB becomes entrenched, chronic, and poses significant risks to health, safety, and quality of life. Research

indicates that individuals with autism are at higher risk for developing SIB compared to other intellectual and developmental disabilities (Dimian & Symons, 2022). Few longitudinal studies have followed children from preschool into school age and evaluated the emergence and persistence of SIB over time.

Objectives: The purpose of this study was to examine how persistent, frequent, and severe SIB was among a cohort of children with ASD followed from preschool into school age.

Methods: All children included in this study had a clinically confirmed diagnosis of autism (n=21, 17% female). This dataset was part of an ongoing longitudinal study of children who have an older sibling with autism. SIB measurements were collected over time at 36 months of age and at follow up in school age (~10 years) using the Repetitive Behavior Scale, Revised (RBS-R; Bodfish et al. 2000). Adaptive function was assessed in preschool using the Vineland 3 ABC score (VABS; Sparrow et al. 2016) and cognitive ability was evaluated with the Mullen Scales of Early Learning (Mullen, 1995) or Differential Ability Scales 2 (DAS-2; Elliott

2007). We used descriptive analyses, Spearman rank correlations and relative risk to assess the prevalence and severity of school age SIB by previous SIB status at 36 months of age (i.e., persistent SIB, transient SIB, No SIB, Incident SIB) in relation to adaptive and cognitive level in preschool.

Results: SIB point prevalence estimates were 52% at 36 months and 66% at school age. Average severity of SIB was 1.48 (SD= 1.89) at 36 months and 2.48 (SD=2.58) at school age. The most common topographies at 36 months were hits self against surface and hits self with body part. At school age the most common forms of SIB reported were bites self and hits self with body part. Persistence in SIB was positively associated with SIB severity scores at both timepoints ($r_s = .48, p = .03$; $r_s = .68, p < .001$). There were no statistically significant associations between SIB endorsement or severity and measures of adaptive and cognitive functioning. Finally, the relative risk of engaging in SIB at school-age follow up given SIB at preschool age was 1.78.

Conclusions: SIB was highly prevalent at school age follow up, and severity and number of topographies were increased at school age. Those children with stable (i.e. persistent) SIB were characterized by greater severity of SIB at school age than those with transient or incident SIB. Contrary to findings from older individuals, SIB was not statistically significantly associated cognitive or adaptive functioning. More research is warranted to better understand who is at increased risk to engage in chronic SIB so intervention can be leveraged earlier to increase quality of life.

432.214 Perceptual Decision-Making in Autistic and Non-Autistic Adults and Relationship with ADHD-Related Traits

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Background: Autistic individuals respond to sensory information in perceptual tasks differently than non-autistic individuals. However, previous research has largely neglected the multiple component processes that contribute to these responses, so it is unclear which processing stages are affected in autism (e.g., early sensory processing or later decision-making strategies). The diffusion model allows the decomposition of performance into distinct processing stages (see Figure). Previous studies using this model have suggested that autistic individuals adopt a cautious decision-making style, emphasising accuracy over speed. However, this approach has not been widely applied across tasks, and often the samples used are modest, yielding inconclusive results. Furthermore, the effect of co-occurring ADHD traits on perceptual decisions has also not been established, which is important given the high co-occurrence of autism and ADHD traits, and previous work showing differences in diffusion model parameters between those with and without ADHD.

Objectives: Here we applied the diffusion model to decompose performance in a numerosity discrimination task into distinct processing stages. We aimed to understand which processing stages vary between autistic and non-autistic individuals, and how they correlate with ADHD-related traits. While commonly used to assess perceptual decision-making, the numerosity discrimination task has not yet been applied to autism or ADHD.

Performance in this task may be important for better understanding mathematical cognition in these conditions.

Methods: We conducted a pre-registered study with a rigorous blinded analysis approach. We investigated group differences between diagnosed autistic (n = 100, aged 21-40 years, 47 females, 43 males, 9 non-binary, 1 non-disclosed) and neurotypical (n = 100, aged 22-40 years, 40 females, 59 males, 1 non-disclosed) participants with comparable non-verbal reasoning ability, and assessed relationships with ADHD traits. Participants completed an online numerosity discrimination task (as accurately and quickly as possible) with stringent, pre-registered inclusion/exclusion criteria. Data were fit with hierarchical Bayesian diffusion models.

Results: Models showed good convergence and fit. We found conclusive evidence (Bayes factors > 3) that autistic individuals have shorter non-decision times than neurotypical individuals, reflecting less time taken for sensory encoding and/or response generation, with no group differences in the rate at which participants accumulate sensory evidence and no differences in their response caution. There was also evidence that individuals with higher verbal hyperactivity-impulsivity accumulated sensory evidence more slowly. These results withstood robustness checks.

Conclusions: We show that autistic and non-autistic adults vary in their non-decision times. Future research will need to disentangle the relative contributions of sensory encoding and/or response generation. We found no group differences in response caution (unlike in other studies), which could be due to the emphasis of both speed and accuracy in task instructions. The rate of accumulation of sensory evidence was linked to verbal hyperactivity/impulsivity, showing the importance of considering the contribution of co-occurring ADHD traits. The diffusion model therefore provides a fine-grained approach to reveal how the processing stages contributing to perceptual decisions converge and diverge across different aspects of neurodiversity.

**432.215** Psychometric Properties of the Senses-R

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Background:

Sensory processing difficulties are a core feature of ASD, as described in the DSM-5-TR, and can manifest as hypersensitivity, hyposensitivity, or unusual sensory interests. Despite their clinical significance, no standardized tool previously assessed all three aspects comprehensively. To address this gap, Turkensteen and Blijd-Hoogewys (2020) developed the Senses, a Dutch self-report questionnaire designed to assess sensory processing in adults with ASD. The Senses has shown strong psychometric properties. Based on initial validation, the Senses-R, a shortened version, was created.

Objectives:

To assess the psychometric properties of the Senses-R, including reliability, validity, and factor structure.

Methods:

The clinical group ($n = 862$) comprised adult patients referred to a mental health clinic for ASD assessment, with 63% ($n = 541$) receiving an ASD diagnosis (ASD group versus non-ASD group). Measures administered included the AQ-50, Senses-R, BRIEF-A, and AASP. A subset of participants ($n = 68$) completed a second Senses-R assessment 3–10 weeks later to evaluate test-retest reliability. The control group ($n = 183$) was recruited via social media from the general population, with exclusion criteria of self-reported ASD or an AQ-10 score above 5.

Internal consistency was measured using Cronbach's alpha, while test-retest reliability was assessed with Pearson correlation. Factor analysis was performed using principal component analysis (PCA). ROC analysis assessed the ability of the Senses-R to differentiate ASD patients from controls. Convergent validity was tested through correlations with the AASP, while divergent validity was explored by correlating the Senses-R with two BRIEF-A subscales: Organization of Materials and Task Evaluation.

Results:

The Senses-R showed strong psychometric properties. Internal consistency for the total score was excellent ($\alpha = .904$), with subscales for hypersensitivity ($\alpha = .862$), hyposensitivity ($\alpha = .833$), and unusual sensory interests ($\alpha = .758$). Test-retest reliability was high ($r = .881$, $p < .001$). Convergent validity with the AASP was robust, particularly for hypersensitivity ($r = .795$, $p < .001$). Divergent validity analysis found significant equivalence with the BRIEF-A Organization of Materials scale ($r = .220$, $p = 0.013$), but not with Task Evaluation ($r = .308$, $p = 0.59$).

The three research groups differed significantly in Senses-R total scores ($p < .001$, $\eta^2 = .294$). The Senses-R correlated strongly with autism severity (AQ-50, $r = .568$, $p < .001$) and showed good discriminative ability between clinical and control group (AUC = .918). Gender analysis confirmed these differences. PCA revealed a 3-factor structure corresponding to the three sensory domains in the DSM-5-TR, explaining 38% of the variance.

Conclusions:

The Senses-R is a reliable and valid tool for assessing sensory processing issues in adults with ASD. It demonstrates excellent internal consistency, strong test-retest reliability, and good convergent validity. While divergent validity was mixed, the scale successfully differentiates between ASD and non-ASD individuals, showing promise for use in clinical settings. The Senses-R is well-suited for evaluating sensory complaints aligned with DSM-5-TR's B4 criteria for ASD diagnosis.

432.217 Auditory and Gustatory Sensory Responsivity Are Linked to Anxiety Symptoms in Autistic Preschoolers

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Background: Sensory impairments, such as hyper-responsivity to sensory stimuli, have been shown to contribute to anxiety symptoms in autistic children. However, the impact of modality-specific (e.g., visual, auditory) sensory impairments on anxiety symptoms, particularly in preschool-aged autistic children with co-occurring intellectual disability (ID), is largely unknown. As at least 40% of autistic preschoolers experience significant anxiety symptoms, characterizing the unique contributions of sensory impairments to anxiety symptoms during early development is crucial in identifying factors impairing daily functioning and mitigating later difficulties associated with anxiety in school, social, and home settings.

Objectives: To explore the relationships between modality-specific sensory impairments and anxiety symptoms in autistic and non-autistic (NT) preschoolers using a network estimation model.

Methods: Participants included 46 autistic preschool children [$M(SD)_{age}=3.60(0.50)$ years; 17% female; $M(SD)_{IQ}=59.26(14.50)$]. Thirty-five autistic participants (76%) had co-occurring ID ($IQ < 70$). Thirty-three NT children were included as an age-matched sample [$M(SD)_{age}=3.56(0.86)$ years; 21% female; $M(SD)_{IQ}=101.09(16.70)$]. Measures included the Sensory Experiences Questionnaire – Version 2.1 (SEQ) and Preschool Anxiety Scale-Revised (PAS-R). Network analyses were conducted using undirected graphical least absolute shrinkage and selection operator (gLASSO) as a form of regularization in R to explore how SEQ modalities (auditory, visual, tactile, gustatory, vestibular) interacted with each other and the PAS-R Total Score. All variables were converted to z-scores for standardization. Network centrality measures (i.e., strength, closeness, and betweenness) were obtained.

Results: Groups did not differ on PAS-R scores ($t(77)=1.108$, $p=.271$), but autistic preschoolers exhibited higher scores for all sensory modalities measured by the SEQ, $ts(77)\leq 4.04$, $ps\leq .001$. In autistic preschoolers, gustatory ($r=.32$) and auditory ($r=.38$) responsivity had a moderately strong positive association with anxiety, with tactile responsivity showing a weak negative association with anxiety ($r=-.19$). No other variables contributed to anxiety in the autistic group. Centrality statistics indicated that anxiety, gustatory and tactile modalities were most frequently occurring in the autistic network ($z>1$). For NT preschoolers, anxiety was moderately positively associated with tactile responsivity ($r=.38$) and weakly associated with gustatory responsivity ($r=.28$). All centrality statistics indicated that tactile responsivity was most recurrent in the NT network. Network analysis results are depicted in Figure 1.

Conclusions: Findings demonstrated that gustatory responsivity was central to the network in autistic preschoolers, followed by anxiety and tactile responsivity. Auditory and gustatory responsivity were both moderately associated with anxiety symptoms and modulated relationships with other sensory modalities. In contrast, tactile responsivity was most influential in the network and most associated with anxiety in NT preschoolers. These results suggest that a combination of different sensory stimuli may interact with and influence anxiety symptoms in autistic preschool children as compared to NT preschoolers. Targeted interventions involving increasing habituation to gustatory and auditory stimuli may assist with reducing anxiety symptoms in autistic preschoolers.



432.218 Restricted and Repetitive Behaviors in Toddlers Newly Diagnosed with Autism

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Background: Restricted and repetitive behaviors (RRBs) are core diagnostic criteria for autism spectrum disorder in the Diagnostic and Statistical Manual of Mental Disorders (5th ed.; DSM-5-TR American Psychiatric Association, 2022). How these core features of autism manifest in young children newly diagnosed with autism is not well characterized, particularly with respect to associations with other child and family characteristics. As RRBs span behaviors that may function as strengths (Klin et al., 2007; Nasr, 2015; Winter-Messiers et al., 2007) or interfering behaviors (Dimian et al., 2023), family empowerment may be an important family characteristic related to the manifestation of RRBs.

Objectives: The objectives of the present study were to 1) characterize RRBs in a group of young children newly diagnosed with autism and 2) examine relations of RRB to other parent-reported child and family variables.

Methods: Data were collected for $n = 44$ young children between 1 and 5 years of age ($M = 2.84$ years, $SD = 1.24$; 27% assigned female at birth; 16% from Spanish-speaking families). Data were collected using the Repetitive Behavior Scale for Early Childhood (RBS-EC; Wolff et al., 2016), Autism Impact Measure (AIM; Mazurek et al., 2020), Vineland Adaptive Behavior Scales, Third Edition (Vineland-3; Sparrow et al., 2016), Family Empowerment Scales (FES; Koren et al., 1993), and Behavior Problems Inventory-Short Form (BPI-S; Rojahn et al., 2012a, 2012b). A three-step hierarchical multiple regression model was built to investigate the relations between biological variables (age, sex assigned at birth), behavioral variables (autism characteristics, adaptive behavior, and problem behaviors), and family variables (family empowerment) to RRBs in toddlers and young children newly diagnosed with autism. Cohen's f^2 was calculated to estimate effect sizes.

Results: Overall, hierarchical regression modeling found biological, behavioral, and family variables to significantly explain variance in RRBs in young children newly diagnosed with autism. The first step of the hierarchical multiple regression model, including biological variables age and sex assigned at birth, did not significantly explain variance in RRBs, $F(2, 34) = 3.11$, $p = .057$, $f^2 = 0.18$. The second step added behavioral variables (autism characteristics, adaptive behavior, and behavior problems), significantly explaining variance in RRBs with a large effect size, $F(5, 30) = 11.65$, $p < .001$, $f^2 = 1.92$. The third step added family empowerment and significantly explained variance in RRBs with a large effect size, $F(6, 29) = 14.19$, $p < .001$, $f^2 = 2.94$. A greater level of autism characteristics and behavior problems were associated with more frequent RRBs. Younger age and lower adaptive behavior scores were also associated with more frequent RRBs. Notably, after biological and behavioral variables were accounted for, families with greater levels of empowerment had children with less frequent RRBs, on average.

Conclusions: Overall, a variety of factors, including biological, behavioral, and family variables, explained the variance in the frequency of RRBs in young children newly diagnosed with autism. A limitation of this study was that all measures were parent-report. Future analyses should include direct measures of child development and autism symptomatology, including RRBs.

**432.220** Retrospective Review of Children's Diagnostic Assessments for Autism Spectrum Disorder in BC: Are We Identifying Co-Occurring Motor Deficits?

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Background: Motor impairments are highly prevalent in children with Autism Spectrum Disorder (ASD). Current data suggest that 50–88% of autistic children experience difficulties in performing gross- and fine-motor skills, with motor performance that is usually slower, less accurate, and more variable than that of neurotypical children [1]. These motor challenges can have a negative cascading effect on a child's quality of life, limiting their ability to interact with peers and participate in social and physical environments (e.g., school, playground, community). Interestingly, the nature of motor impairments in ASD often meets the criteria for Developmental Coordination Disorder (DCD), a distinct neuromotor disability marked by significant difficulty in learning and performing motor skills at an age-appropriate level. Since the publication of DSM-5 in 2013, a dual diagnosis of ASD and DCD has been permitted. However, DCD is under-recognized and under-diagnosed in this population, with less than 15.1% of children with ASD receiving a dual diagnosis of DCD [2]. Delayed diagnosis of motor challenges or DCD can limit opportunities for early, targeted interventions and inhibit timely referral to support services.

Objectives: The purpose of this study is to: (1) determine the prevalence of motor problems in children diagnosed with ASD before (2000-2013) and after the publication (2014-2019) of DSM-5; and (2) determine how many of these children received a co-occurring diagnosis of DCD.

Methods: Data from medical records of 19,307 children (15,090 males; 4,207 females; 10 unreported) ages 2-18 years [mean (SD) age: 7.5 (4.2) years: assessed for ASD in British Columbia from 2000–2019 have been extracted. Between 2000-2013, 4,358/7,779 (56%) children received an ASD diagnosis, compared to 7,689/11,528 (67%) from 2014-2019. We did not include data from 2020 given the change in practice during the COVID-19 pandemic. We are in the process of coding motor concerns consistent with DCD and DCD diagnosis; children with intellectual disabilities and other conditions affecting movement will be excluded. We will determine the prevalence of fine and/or gross motor difficulties that were reported as part of the ASD assessment and determine the number of children who were given the diagnosis of DCD after 2013.

Results: We expect that motor concerns and DCD diagnosis will be under-reported in children with ASD.

Conclusions: Identification of DCD in children with ASD is critically important as there is an effective, evidence-based intervention to improve the motor skills of children with ASD (without intellectual disability) [3]. Screening for DCD should become routine clinical care when assessing children for ASD.

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432.221 Reward-Associated Changes in Oculomotor Control Are Associated with Executive Function in Adolescents with Autism Spectrum Disorder

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Background: Atypical processing of reward has been implicated in both core social-communication and repetitive behavior symptoms of autism spectrum disorder (ASD), as well as commonly co-occurring diagnoses (e.g., attention-deficit/hyper-active disorder, ADHD); however, studies have yielded inconsistent findings. Studies of non-human primates have identified the oculomotor system as a powerful tool for measuring reward-facilitated changes in behavior with a high degree of sensitivity. Specifically, expectation of reward produces faster, more accurate eye movements; these changes are facilitated via increases in dopaminergic transmission within the basal ganglia.

Objectives: The purpose of the current study was to adapt a visually-guided saccade task to measure the effects of reward expectation on oculomotor behavior in ASD and measure associations with core and co-occurring features of ASD. We hypothesized that reward contingencies would lead to faster saccades in both autistic and age-matched neurotypical (NT) control participants, but that autistic participant would show attenuated changes that were more variable across individuals.

Methods: We studied N=19 autistic adolescents and N=23 age- and sex-matched NT controls. Participants were instructed to look to the peripheral target as quickly as possible (saccade). Participants could earn points for looking to the target quickly (indicated by a green circle preceding the block of trials). Points were later converted to money; participants did not know the conversion rate. Trials were blocked into no-reward (2) and reward (2). Reward criteria: During the first block of trials (no-reward), saccade latencies were collected. On subsequent reward trials, points would be awarded (green checkmark) if the saccade latency was shorter than the median latencies collected during the first block. We estimated this would allow for participants to earn reward roughly 50% of the time.

Results: Across groups, saccade latency and latency variability were reduced during reward vs. no-reward trials. Autistic participants showed greater changes in saccade velocity (controlling for amplitude) during reward vs. no-reward trials, relative to NT controls. Among autistic participants, increased saccade velocity during reward relative to no-reward trials was associated with greater executive function difficulties. Similarly, greater improvements in latency variability on reward relative to no-reward trials were associated with greater executive function difficulties and reduced cognitive flexibility.

Conclusions: Reward expectation yielded similar changes in oculomotor behavior across ASD and control groups, suggesting that reward-motor integration is intact in autism. Changes in saccade velocity have been linked directly to changes in dopaminergic transmission, reflecting enhanced response to reward cues. Consistent with dopaminergic hypotheses of ADHD-type symptoms, we found that greater impairments in executive function (i.e., initiating, planning, and completing tasks) were associated with greater response to reward contingencies (increased saccade velocity), suggesting that extrinsic reward cues may be effective for modifying behaviors. Reductions in latency variability during rewarded conditions likely arise from increased attention to task-relevant information, resulting in more consistent initiation of saccades. Similarly, our finding that reward-associated latency variability changes were greater in autistic individuals who exhibited more difficulties with executive function and reduced cognitive flexibility suggests that reward may help these individuals inhibit attention to task-irrelevant information to improve task performance.

432.222 Self-Perceptions of the Impacts of Selective Eating in Young Adults**R. A. Rivera** and **L. Bennetto**, *Psychology, University of Rochester, Rochester, NY*

Background: Young adulthood presents a crucial time in development to study eating experiences, as many emerging adults begin to transition to greater independence and become more autonomous in making decisions about their health and well-being. In particular, young adults who live away from home have less mealtime influence from parents and greater influence from peers, personal preference, sensitivities, or other behavioral factors. Additionally, research has shown that selective eating can generally confer additional risk for mental health concerns and well-being among the general population. Finally, autistic adult self-advocates have highlighted eating concerns and sensory sensitivities as important areas of research.

Objectives: This study aimed to examine the nuances of eating experiences amongst autistic and non-autistic young adults by assessing (1) group differences on four aspects of selective eating (i.e., food neophobia, individual food selectivity, food quality selectivity, and Avoidant/Restrictive Food Intake Disorder [ARFID] symptoms) and (2) self-perceptions of the impacts of food preferences and eating behaviors on four domains of daily life (e.g., social life, physical health, mental health, logistics/financial well-being).

Methods: The sample comprised 416 autistic and non-autistic young adults aged 18-27 ($M = 20.2$), who were recruited through a variety of sources including community-based groups, online research databases, social media, and university undergraduates. All participants completed included a series of online questionnaires and standardized measures assessing multiple domains: food preferences and eating experiences, autistic traits, mental health (e.g., anxiety and depressive symptoms), BMI, and their perceptions on how their eating experiences positively and/or negatively impacted different domains of their life.

Results: ANOVAs on food selectivity showed that autistic young adults reported greater food selectivity across all four measures compared to non-autistic young adults (all $ps < .001$). Notably, 42% of the autistic group endorsed clinically significant restrictive eating the compared to 9% of the non-autistic sample. Autistic young adults also reported greater depressive symptoms, anxiety symptoms, and higher body mass index (all $p < .001$) compared to non-autistic participants. Of note, increased food selectivity (across all four measures) was significantly correlated with higher anxiety and depressive symptoms (all $ps < .001$), but not with BMI. Chi-square tests suggested that autistic young adults were more likely to report that their food preferences and eating behaviors impacted their social life ($p < .001$) and meal planning and financial well-being ($p < .001$). For those who reported an impact of their eating experiences, over half of the autistic young adults reported at least "somewhat" negative impacts across all four domains.

Conclusions: This study expands our understanding of eating experiences among autistic and non-autistic young adults by assessing outcomes and perceived impacts related to food preferences and eating behavior. This is a critical first step in identifying who may be at risk for more significant outcomes related to eating concerns beyond childhood. Moreover, this can help educate providers on the importance of proactively addressing concerns related to food selectivity in young adulthood.

432.223 Sensory Atypicality, Internalizing and Externalizing Problems in Children with ASD**M. W. A. Lam¹**, **P. W. Leung²** and **O. Wong³**, *(1)Department of Psychology, Department of Psychology, The Chinese University of Hong Kong, Hong Kong, Hong Kong, Hong Kong, (2)Department of Psychology, The Chinese University of Hong Kong, Hong Kong, Hong Kong, Hong Kong, (3)Department of Psychiatry, Department of Psychiatry, The Chinese University of Hong Kong, Hong Kong, Hong Kong (China)*

Background: Since the incorporation of sensory atypicality as a core symptom of Autism Spectrum Disorder (ASD), there has been an increasing interest in their associations with other ASD symptomology, and co-occurring emotional and behavioural problems. However, the interplay among these factors remains inconclusive. Additionally, . Yet, the broader range of internalising and externalising problems is seldom examined. The understanding of how these factors interact would be crucial for informing treatment development and support for ASD children and their caregivers.

Objectives: This study aimed to elucidate the relationships between sensory atypicality, emotional and behavioural problems in children with ASD.

Methods: Data from 749 children with ASD of normal intelligence (male:female ratio = 6.88:1; mean age = 7.89 years) were analysed. Participants were recruited from the Children and Adolescent Psychiatry Clinic of a university teaching hospital. Caregivers completed three instruments: the Social Responsiveness Scale (SRS-2), the Sensory Experience Questionnaire (SEQ), and the Child Behaviour Checklist (CBCL). Path analysis was conducted to examine the mediated relationships between sensory response patterns, ASD symptoms, and internalizing and externalizing problems. **Results:** Our final model demonstrated good fit ($\chi^2(8) = 24.220$, $p = .002$; CFI = .992, SRMR = .030, RMSEA = .053). Results revealed that sensory hyper-responsiveness and hypo-responsiveness indirectly affected internalizing and externalizing problems through social communication impairment and restricted/repetitive behaviours. Specifically, both hypo- and hyper-responsiveness exhibited similar patterns of indirectly influencing internalizing problems through both social communication ($p < .001$), and externalizing problems through restricted/repetitive behaviours ($p < .001$). In contrast, sensory seeking directly influenced externalizing problems ($p < .001$), with restricted/repetitive behaviours also serving as an indirect pathway ($p < .001$).

Conclusions: Given the interlinkage between sensory atypicality, core ASD symptoms, and co-occurring psychopathology in ASD children, our findings suggested a potential shared mechanisms underpin these clinical symptoms. While hypo- and hyper-responsiveness exerted a generalised impact on both internalizing and externalizing problems, sensory seeking behaviours specifically linked to externalizing problems. Our study highlights the importance of addressing sensory issues in ASD interventions. Thus, tailored, integrated intervention approaches combining social skills training, behavioural therapy, and strategies to manage sensory atypicality may effectively mitigate common co-occurring psychopathology in children with ASD.

**432.224 Sensory Differences and Their Consequences: Relating Neural Signals of Auditory Habituation to Behavior in Autism****K. A. McNair¹**, **Y. Braverman²**, **D. Senturk³** and **A. R. Levin⁴**, *(1)Boston Children's Hospital, Boston, MA, (2)Neurology, Boston Children's Hospital, Brookline, MA, (3)UCLA, Los Angeles, CA, (4)Neurology, Boston Children's Hospital / Harvard Medical School, Brookline, MA*

Background: Up to 70% of autistic people will experience auditory processing (AP) difficulties in their lifetime (Williams et al., 2021). Differences in AP have been linked to many common behavioral and social challenges, such as sound tolerance and speech affect recognition. These differences are largely recognised to have a neurobiological basis, specifically, atypical cortical processing following sound.

Electroencephalography (EEG) offers precise insight into cortical AP over time. EEG measures of AP in autism, however, are characteristically heterogeneous, with hyper- and hypo-sensitivity reported. Similarly, sensory behaviors exhibited by autistic people are diverse. In the pursuit of biomarkers for autism which reliably predict behavior, work is needed to investigate individual differences in EEG measures and how they relate to behavioral outcomes.

Objectives: We pair a novel auditory habituation paradigm with electroencephalography (EEG) to investigate (a) event-related potential (ERP) habituation in the P100 component in autistic and typically developing (TD) children, and (b) how individual differences in P100 habituation relate to behavior.

Methods: 44 3- to 4-year-old children (24 TD, 20 autistic children) were presented with 50 groups of five 50ms 1000Hz tones, separated by 700ms of silence. EEG was continuously recorded with a 128-channel EGI Geodesics net. Data were pre-processed using EEGLAB functions. P100 amplitudes following each tone were computed from Cz and two neighboring electrodes. A linear regression was conducted for each participant with P100 amplitude as the dependent and tone number (1-5) as the independent variable, and standardized β coefficients (slopes) were extracted. We interpreted negative slopes as habituation. Each participant was also administered a Sensory Assessment for Neurodevelopmental Disorders (SAND). Data collection is ongoing (target N = 60). 19 TD children and 11 autistic children have validated SAND scores which were used for the reported analyses, with remaining scores to be validated.

Results: Preliminary analyses reveal smaller slopes in TD children ($M = -0.14$, $SD = 0.42$) relative to autistic children ($M = 0.23$, $SD = 0.51$), $t(37.06) = -2.58$, $p = .014$. 30% of autistic children (6) and 62.5% of TD children (15) demonstrated negative slopes, and were classified as 'habitutors'. An exploratory ANOVA revealed that, in the autism group, sensory seeking scores were higher in 'habitutors' ($M = 7.25$, $SD = 2.22$) compared to 'non-habitutors' ($M = 3.71$, $SD = 3.20$), with a trend toward significance $F(1,9) = 3.76$, $p = .084$, $\eta^2 = 0.29$. This relation was insignificant for TD children ($p = .743$).

Conclusions: Our results demonstrate P100 habituation in TD children, with no consistent habituation and a positive average slope (i.e., facilitation), in autistic children. Efforts to link individual differences in P100 slopes to behavioral measures are continuing, with promising early evidence that P100 habituation slopes are uniquely linked to sensory seeking behaviors in autism. Our findings offer exciting opportunities for both forward translation, by connecting EEG measures to meaningful outcomes for families and clinicians, and back translation, by connecting to animal-model habituation studies examining underlying brain mechanisms such as excitatory/inhibitory balance in short term synaptic plasticity (Seay et al., 2020).



432.225 Sensory Processing and Emotional Dysregulation in Autistic and Nonautistic Students: Preliminary Insights on the Potential Role of Classroom Environment

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Background: While sensory processing difficulties are associated with emotional dysregulation among autistic students (e.g., Little et al., 2017), less is known about the role of classroom environments in shaping this relationship. Emotional dysregulation, a mismatch between students' physiological arousal and the environment, can negatively impact classroom learning and engagement (Howe & Staggs, 2016; Sparapani et al., 2016).

Objectives: This study examined group differences between autistic and nonautistic students in the associations between sensory processing as measured by the individual domains of the Sensory Profile-2 (SP2; Parham et al., 2021), emotional dysregulation as measured by the *Classroom Measure of Active Engagement* (Sparapani et al., 2016), and the quality of the classroom environment as measured by the *Quality of Classroom Learning Environment* (QCLE; Connor et al., 2014).

Methods: 82 students (41 autistic, 41 non-autistic) were recruited from a 4-year exploration study examining inclusion of neurodivergent students within general education classrooms (R324A210288). Students ($M = 6.46$, $SD = 1.29$) ranged between TK and 5th grade and were from diverse ethnic, racial, and linguistic backgrounds. Teachers completed a battery of questionnaires, and video observations of academic lessons were collected. Trained observers coded emotion regulation using the *CMAE* and three dimensions of the classroom environment (differentiation, organization, responsiveness) using the *Q-CLE* within a 20-minute video sample. Interrater agreement between observers was above 80% for all dimensions. Spearman's correlations were used to examine associations between sensory processing and emotion dysregulation.

Results: Preliminary findings from a sample of 48 students (21 autistic, 27 non-autistic) are reported. Scores on the Q-CLE ($M = 9.67$) ranged between 5 and 16, with higher scores indicative of higher quality learning opportunities. On average, autistic students spent 28% ($M = 5.57$ mins; $SD = 4.41$) of the sampled time in a dysregulated state; non-autistic students spent 14% ($M = 2.83$ mins; $SD = 2.51$) of the time in a dysregulated state. These findings were significantly different ($p < 0.05$). We observed differences in sensory processing skills between autistic and non-autistic students, with autistic students exhibiting more sensory processing difficulties. See Table 1. Finally, we observed moderate, positive correlations between dysregulation with auditory sensitivity ($r = 0.370$, $p = 0.021$), visual sensitivity ($r = 0.320$, $p = 0.047$), and touch sensitivity ($r = 0.359$, $p = 0.025$). See Table 2.

Conclusions: This study provides a preliminary look at emotion regulation and sensory processing within general education classrooms, outlining significant differences between autistic learners and their non-autistic peers. The nonsignificant associations between emotion dysregulation and sensory processing by group may be due to the small sample size, warranting further analysis. Future analyses will include a larger sample to examine the moderating effect of classroom environment on the relationship between sensory processing and emotional dysregulation, with the hypothesis that sensory-friendly, structured classrooms can buffer against sensory-induced dysregulation in autistic students.



432.226 Sensory Profiles in Children with Neurogenetic Syndromes and Their Relation to Social Impairment

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Background:

Sensory profiles are measured through processing patterns including hyporesponsiveness and hyperresponsiveness. Sensory processing difficulties, present in 74% of children with autism spectrum disorder (ASD), are a diagnostic feature of ASD, present as early as 6-months of age, and may predict later social communication deficits (Kirby et al., 2022). Children with neurogenetic syndromes (NGS) often show ASD symptoms, including sensory and social communication deficits. However, while children with NGS have social and sensory profiles similar to children with ASD, the similarities and differences in the neurodevelopmental pathways of sensory processing and social communication between ASD and NGS groups has yet to be examined in early childhood.

Objectives:

This study aims to identify the proportion of atypical sensory profiles in children with NGS, and how they differ from those of typically developing (TD) children. Secondarily, we aim to examine the extent to which sensory profiles relate to social impairment within NGS groups.

Methods:

Data from caregivers of three-year-old ($M=41.59$, $sd=3.33$) children with NGS ($n=139$) and TD children ($n=46$) were subselected from a longitudinal study of early phenotypes. NGS groups included Angelman Syndrome (AS; $n=36$), Williams Syndrome (WS; $n=33$), Fragile X Syndrome (FXS; $n=21$), Down Syndrome (DS; $n=23$), and Prader Willi Syndrome (PWS; $n=26$). Here, we examine cross-sectional sensory and social profiles through the Sensory Experiences Questionnaire (SEQ; Baranek, 2006) and the Social Responsiveness Scale (SRS; Constantino & Gruber, 2012).

Results:

Depicted in Figure 1, atypical sensory profiles were present across all groups, including TD controls (AS=52.8%, WS=48.5%, FXS=33.3%, DS=21.7%, PWS=11.5%, TD=13%), at rates statistically greater than 0 ($p's<.001$). Significant differences of sensory profiles from TD children presented in AS, FXS, and WS. For Total SEQ scores, AS ($M=75.67$, $sd=14.93$), FXS ($M=70.52$, $sd=14.27$), and WS ($M=73.27$, $sd=13.56$) were higher than TD ($M=57.76$, $sd=11.85$) ($p's<.001$). Similarly, hyporesponsive SEQ scores in AS ($M=12.03$, $sd=4.16$) and WS ($M=9.723$, $sd=2.32$) were higher than TD ($M=7.96$, $sd=2.23$) ($p's<.001$). Hyperresponsive SEQ scores in WS ($M=31.12$, $sd=6.76$) were higher than TD ($M=25.63$, $sd=5.78$) ($p=0.001$). A chi-squared analysis (Table 1) of SRS and SEQ scores revealed significant associations between categorically elevated SRS and total ($X^2(1)=27.98$, $p<.001$), hyperresponsive ($X^2(1)=8.57$, $p=0.003$), and hyporesponsive ($X^2(1)=22.42$, $p<.001$) SEQ scores.

Conclusions:

Sensory processing difficulties are common in children with AS, WS, and FXS, although at lower rates than in ASD according to the literature. This study examined the degree to which these atypical profiles present in early childhood across NGS. While atypical profiles were present in DS and PWS, groups did not differ from TD children on this measure. This indicates that either (1) the SEQ may not capture sensory difficulties across all NGS groups, or (2) temporal emergence of sensory processing difficulties occurs non-linearly across NGS, with some groups appearing typical in early childhood. We also found that sensory processing difficulties in NGS were associated with ASD symptomology across total, hyperresponsive, and hyporesponsive SEQ scores, indicating potentially similar developmental associations between sensory processing and social communication. Future research may identify whether interventions developed for ASD are appropriate and effective for NGS groups, given potentially unique early developmental trajectories.

**432.227 Sensory Response Pattern Trajectories in Children 2-12 Years with and without Autism**

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Background: Four sensory response patterns are commonly reported by caregivers of autistic children ages 2-12 years: Hyperresponsiveness (HYPER) involves aversive or avoidant responses to stimuli; Hyporesponsiveness (HYPO) involves delayed or absent responses to stimuli; Sensory Interests, Repetitions, and Seeking Behaviors (SIRS) are characterized by an intense fascination or interest in specific sensory stimuli; and Enhanced Perception (EP) involves heightened discrimination or finer acuity in perceiving sensory stimuli (Ausderau et al., 2014; Baranek et al., 2014). The Sensory Experiences Questionnaire Version 3.0 (SEQ-3; Baranek, 2009) assesses these patterns, validated in the autistic sample, and demonstrated stability over three years (Baranek et al., 2019). Despite the strong construct and discriminant validity studies in the literature, age-related developmental changes in each sensory pattern remain unclear. Further, developmental trajectories need to be tested more definitively across autistic and non-autistic groups to establish whether differences exist in the rate or shape of change across the four sensory response patterns. We hypothesize that the four sensory response patterns may follow distinct trajectories in the two groups. Mapping developmental trajectories has important clinical implications for assessment and intervention planning.

Objectives: To examine how sensory response patterns change across age, and test group differences between autistic and typically-developing (TD) children ages 2-12 years in a large national sample.

Methods: Participants ages 2-12 years (N=2087) were pooled from three studies that collected caregiver-reported SEQ-3 data as part of their larger battery. A total of 1,271 autistic children (mean age: 7.4 years) and 816 TD children (mean age: 7.0 years) were aggregated. The final analysis included 2,099 SEQ-3.0 measurement points for autistic children and 840 for TD children; each child had at least one, and no more than four, SEQ-3 measurements. SAS PROC MIXED models tested linear (age), quadratic (age²), and cubic (age³) models of age, as well as tests of group interactions for each of the four sensory response patterns. Model-estimated scores for each sensory response pattern from ages 2 to 12 were generated and graphed for models that were significant ($p < .05$).

Results: As compared to TD, autistic children had significantly higher scores across all four sensory response patterns (see Table 1). The group X age interaction was significant for SIRS ($p=0.03$), HYPO ($p < 0.01$) and EP ($p=0.03$), indicating that the slope and the shape of these three patterns differed between the two groups over age (see Figure 1). However, slopes and shapes for the groups followed a similar trajectory for HYPER. All four main effects of age (linear) were significant; the quadratic effect was significant for EP.

Conclusions: These findings from a large pooled sample illustrate differences in the expected development across each of the four sensory response patterns from 2-12 years of age, and further, highlight how autistic and non-autistic children differ in their level and rate of change on some, but not all, variables. Longitudinal studies that systematically collect more timepoints across groups, and minimize potential cohort effects, are needed for replication; such research is critical to inform guideposts for clinical assessment and intervention efficacy.



432.228 Sensory Responses of Autistic Children to Environmental and Food-Related Stimuli in a Restaurant Setting

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Background: Autistic children often face challenges in processing sensory inputs, which can significantly impact their daily experiences. In particular, food-related activities, such as dining out or grocery shopping, may pose significant difficulties due to over- or under-stimulation in public settings. There is a critical need for research to better understand how environmental sensory inputs (e.g., background sounds) affect autistic children in everyday public environments, such as grocery stores and restaurants.

Objectives: This study aimed to examine how autistic children respond to various environmental and food-related stimuli, specifically within the immersive context of a restaurant setting.

Methods: The sensory responses of autistic children (ASD) were compared with those of neurotypical children (NT) in an immersive restaurant environment. The study focused on their reactions to both auditory comfort and discomfort conditions. Thirty children, aged 7 to 14 years (15 ASD and 15 NT), participated in this study. They rated their liking of different food stimuli and used emojis to express their emotional responses to various samples and conditions.

Results: The ASD group rated their liking for a cocoa solution significantly lower than NT children under the comfort sound condition. In the discomfort sound condition, autistic children perceived the cocoa solution as significantly more intense compared to their neurotypical counterparts. Additionally, differences were observed between the groups in the use of emojis to express their feelings about the samples and conditions.

Conclusions: This study confirms that environmental factors, particularly background sound levels, can significantly influence the sensory responses of autistic children. The findings highlight the importance of creating sensory-friendly environments, especially in public spaces such as restaurants. These insights can guide foodservice businesses in designing more inclusive, comfortable experiences for autistic individuals.

432.229 Sex and Autism Diagnosis Moderate the Relationship between Anxiety and Repetitive Behaviors in School-Age Children

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Background:

Restricted and Repetitive Behaviors (RRBs) are a core feature of autism. They have also been found to consistently associate with anxiety in both autistic and non-autistic children (Keating et al., 2023; Sellick et al., 2021). Despite sex differences in both RRBs (Knutsen et al., 2019) and anxiety (Horwitz et al., 2023), the majority of prior research characterizing the relationship between RRBs and anxiety has been conducted with primarily male samples. It has been theorized that RRBs serve as an early manifestation of anxiety, but the moderating role of sex has not been sufficiently explored (Bird et al., 2024).

Objectives:

(1) evaluate sex differences in anxiety and RRBs cross-sectionally in autistic and non-autistic children, and (2) assess the moderating role of sex and autism diagnosis in the relationship between anxiety and RRBs.

Methods:

Data were collected for 105 autistic (ASD) and 104 non-autistic (NA) children aged 4-8 years ($M=6.5$, $SD=1.5$) enrolled in an accelerated longitudinal design observational study (estimated N by Spring 2025 = 280). The sample includes roughly equal representation by assigned sex in both autistic (ASD; $M=57$, $F=48$) and non-autistic (NA; $M=48$, $F=56$) groups. RRBs and anxiety were assessed through parent-report on the Repetitive Behavior Scales-Revised (RBS-R; Lam & Aman, 2007) and the Parent-Rated Anxiety Scale for Youth with Autism Spectrum Disorder (PRAS-ASD; Scahill et al., 2019).

Results:

There was a main effect of diagnosis, with autistic children having higher rates of anxiety, $F(3,205)=81$, $p<.001$, and RRBs, $F(3,205)=204$, $p<.001$. There was a main effect of sex on RRBs, with males having higher parent rated RRBs, $F(3,205)=6.5$, $p<.05$. There was no main effect of sex for anxiety, although females had a non-significant trend towards higher anxiety, $F(3,205)=1.9$, $p=.17$. The interactions between sex and diagnosis were not significant for anxiety, $F(3,205)=2.3$, $p=.13$, nor RRBs, $F(3,205)=.93$, $p=.34$.

A three-step hierarchical linear regression was conducted to evaluate how sex and diagnosis moderate the relationship between anxiety and RRBs. In step one, anxiety significantly predicted RRBs (Table 1). In step two, adding sex and diagnosis as predictors significantly improved the model fit, $\Delta R^2=.19$, $F(2,207)=57$, $p<.001$, with both sex and diagnosis showing a significant effect (Table 1). In step three, interaction terms between anxiety and sex, $b=-.3$, $t(204)=-2.7$, $p<.01$, and anxiety and diagnosis, $b=-.27$, $t(204)=-1.8$, $p<.1$, were included, further improving the model fit $\Delta R^2=.014$, $F(2,207)=5.2$, $p<.05$, and indicating that the relationship between anxiety and RRBs was moderated by sex and diagnosis (Figure 1).

Conclusions:

Replicating prior research, we found that RRBs are more prominent in autistic males than autistic females. Moderation analyses indicate that the association between anxiety and RRBs is moderated by both sex and diagnosis, such that autistic males with high anxiety also have more RRBs than autistic females with equivalent levels of anxiety. Taken together, these results indicate that RRBs may not serve the same function in autistic females, or that anxiety manifests differentially in females, and less through observable behaviors such as RRBs, potentially indicative of camouflaging in autistic females.



432.230 Special Interests in Autistic Adults Are Wide-Ranging and Intellectually Oriented

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Background:

Special interests are referred to as circumscribed, narrow, and intense. Intense interests among children disrupt family life, interfere with socialization, and impair classroom learning. Yet, why do autistic individuals have intense interests? Current theories mention demand avoidance, self-regulation, and providing a foundation for careers.

Objectives:

How autistic adults describe their intense interests when communicating with other autistic adults was pursued by analyzing online discussion forums.

Methods:

A corpus of 300 posts from 8 discussion forums was compiled by undergraduate research interns, blind to hypotheses of the study, in a systematic manner which disallowed cherry-picking of posts. Forum users posted and responded to broad questions such as "What are your special interests?" and "What is your current hyperfixation?"

Content analysis was guided by four questions.

- What are the types of interests, their range, and their frequencies?
- Did special interests serve the purpose of self-regulation or escaping demands?
- Did interests provide opportunities for systemizing and knowledge acquisition?

Were interests restricted, intense, or idiosyncratic?

Results:

A striking result was the unexpectedly high preponderance of academic topics in posters' special interests, amounting to 40% of all interests. Word counts did not support self-regulation and escape as salient functions (see Table).

Posters frequently described a broad topic and a more specific interest within that, as is characteristic of academic scientists, as illustrated in this quote: "I can spend hours reading about cell biology, endlessly fascinated. My latest hyper fixation, however, was about a protein called focal adhesion kinase, and I spent hours learning everything I could about it and figuring out how it would look like in a cell visually, so I drew lots of diagrams."

It was natural to divide the academic interests into the conventional categories of Social Sciences, Humanities, and Natural Sciences; however, topics related to Psychology and Sociology dominated. Posters mentioned the appeal of studying people's lives without engaging with them, of learning about the psychology behind narcissists, and of researching late diagnoses of autistic women. Some posters were explicit that reading psychology research helped them understand others and how to fit in.

Among history, culture, and literature, posters frequently mentioned highly specific topics, such as Gothic Literature, Queer Women's History, and Recipes from the Depression Era. Even for the 60% of interests that were categorized as non-academic topics, posters described using their interest in ways that support knowledge seeking and systemizing. For example, one poster pursued entertainment media like an academic topic, as in "I asked for a book with all the episodes and summaries and quotes..." One-quarter of posts were coded as demonstrating a wide-ranging intellectual appetite. This code indicated the presence of four or more knowledge-heavy interests from different intellectual domains. Several posters labeled "learning itself" as their special interest.

Conclusions:

More than merely having talents in circumscribed areas, autistic adults demonstrated a preoccupation with knowledge-seeking, similar to that of scientists and academics. Technological changes will mandate life-long learning, positioning autistic adults to be able to make substantial contributions to society.



432.231 Speed-Accuracy Trade-Offs in Motion Coherence Processing in Autistic and Non-Autistic Children

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Background: Multiple previous studies have found reduced sensitivity in motion coherence tasks in autistic relative to typically developing participants. Previous research using other perceptual decision-making tasks has also found differences in speed-accuracy trade-offs, with autistic individuals emphasising accuracy over speed. However, we recently applied a drift-diffusion model to motion coherence task data to examine the processes underlying task decisions, and did not find conclusive evidence for differences in speed-accuracy trade-offs between autistic and non-autistic children, as measured by the boundary separation parameter. Boundary separation reflects how much evidence needs to be accumulated before making a decision, with wider boundary separation indicative of prioritising accuracy over speed. These differences in findings between studies may, in part, be due to differences in task instruction.

Objectives: We aimed to determine whether there was a difference in autistic and non-autistic children's ability to adjust their speed-accuracy trade-offs based on instruction, and to examine differences in boundary separation between groups.

Methods: We conducted a pre-registered study with a rigorous blinded analysis approach and have completed data collection, with 50 autistic and 50 non-autistic participants aged 6 to 14 years in the final sample. We applied hierarchical Bayesian drift-diffusion models to examine differences across versions of a child-friendly motion coherence task: with children asked to either emphasise speed, or accuracy. Here, we are reporting preliminary analyses based on a subset of diagnosed autistic ($n = 22$, male = 14, female = 8) children, matched as closely as possible on age and full-scale IQ with children with no diagnosed developmental conditions ($n = 22$, male = 14, female = 8). For these preliminary analyses, posterior mean estimates for boundary separation, and the posterior mean difference in boundary separation between speed and accuracy conditions were extracted from the fitted data for each participant. Differences were examined using one-way ANCOVAs, controlling for full-scale IQ.

Results: Models showed good convergence and fit. Preliminary analyses revealed no significant group differences in posterior means for drift rate, boundary separation, or non-decision time. Posterior mean differences in parameters between the speed and accuracy conditions were also not significantly different between groups. This indicates that autistic and non-autistic children were able to modulate speed and accuracy when explicitly instructed, in a similar manner.

Conclusions: We show preliminary evidence of no difference in the ability of autistic and non-autistic children to modulate speed-accuracy trade-offs based on instructions. This indicates that the potential tendency of autistic children to respond cautiously can be modulated with explicit task instruction, which could explain previous mixed findings. Analyses on the full dataset will be used to confirm these results using Bayesian statistics to assess the strength of evidence. Further analyses will also consider the contribution of co-occurring ADHD traits on decision-making, and the ability to modulate responses. This is due to both the high degree of overlap between autism and ADHD, and previous research indicating differences in response caution in ADHD.

432.232 Tactile Hypo-Responsivity As a Potential Diagnostic Marker for Autism

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Background: Differences in tactile reactivity are observed in autism and to some extent in children with other developmental concerns. Additionally, research has shown that differences in responding to touch are associated with autism symptom severity and adaptive skills. However, it is unknown whether differences in responding to touch may serve as a diagnostic marker of autism in children referred for developmental evaluation.

Objectives: To examine the utility of a tactile reactivity assessment in differentiating autistic children from those with other neurodevelopmental concerns, and to investigate the association between tactile responsivity, autism symptomatology, developmental level, and adaptive skills.

Methods: Participants included 151 children (108 autism [mean age 31 months], 43 non-autism [mean age 29 months]). Children were referred by community pediatricians for evaluation due to positive autism screening or concerns raised during developmental surveillance. Autism diagnoses were confirmed using the Autism Diagnostic Observation Schedule-2, Vineland Adaptive Behaviors Scale-3, DSM-5 caregiver interview, and expert clinical judgement. Children were administered the tactile portion of the Sensory Processing Assessment (SPA) designed to identify patterns of hypo-responsivity. The task included presenting children with social (shoulder tap) and non-social (air-puff) tactile stimulation while they played with a distractor toy until a clear behavioral response was observed or up to a maximum of three trials for each stimulus. Location (right/left) and order of stimuli was counterbalanced across participants. Possible orienting scores for each stimulus were 1, 2, 3 (consistent with the trial during which the child oriented), or 4 (no response). Measures of autism symptoms, developmental level, and adaptive behavior were also collected. Finally, exploratory analysis was conducted to examine whether engaging in sensory seeking behaviors during play could be associated with tactile responsiveness.

Results: Autistic children showed decreased orienting to both social and non-social touches compared to children in the non-autism group. The social touch responsivity had a sensitivity of 0.62 and a specificity of 0.76. The non-social touch responsivity had a sensitivity of 0.21 and a specificity of 0.93. The sensitivity for overall responsivity was 0.14 and the specificity was 1. For all children, reduced tactile responsivity was associated with greater autism symptomatology, adaptive functioning difficulties and lower developmental levels (all p -values < 0.01). Autistic children who engaged in sensory seeking behaviors showed reduced orienting tactile input.

Conclusions: Autistic children showed reduced orienting to both social and non-social touches compared to children with other developmental disabilities within the context of a brief tactile assessment. Children who did not respond to *both* social and non-social touches were more likely to be in the autism group. Additionally, reduced orienting to tactile stimuli was associated with higher autism symptomatology, and reduced verbal, non-verbal, and adaptive skills in all children. Finally, tendencies of seeking behaviors impacted orienting to external tactile cues within the autism group. These findings highlight the significance of considering touch as a potential biomarker of autism in young children referred for developmental evaluations.

432.233 Tactile Perception and Sensory Differences in Autistic Preschoolers

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Background:

Altered sensory reactivity is common in autism and can significantly affect daily life, often resulting in heightened distress and anxiety. Touch is the first sense to develop, shaping our understanding of the environment and form social bonds. Previous psychophysical studies have demonstrated that differences in low-level tactile perception are correlated with other clinical features of autism such as anxiety. Most prior work focused on older children or adults. However, sensory difficulties in early development can have tremendous cascading effects on higher-order behaviours.

Objectives:

Using highly novel tablet-based psychophysical assessments to measure perception in preschool children and questionnaire-based approaches, we test the relation between sensory measures and anxiety and autistic features. Based on preliminary findings, we determine whether objective measures of sensory processing in toddlers provide sufficient information to characterize individual sensory features and connect them to the severity of core and associated autism outcomes.

Methods:

Eight autistic and 18 non-autistic (12M, 14F; age = 56 ± 14 months) took part. Measures of low-level tactile perception were obtained through a novel tablet-based psychophysical detection task (as measured through reaction time, reflecting sensory gating; Figure A). Sensory differences were evaluated using the Sensory Assessment for Neurodevelopmental Disorders (SAND) reporting observed and parent-report ratings of hyper/hypo-reactivity and sensory seeking. Anxiety was measured gathered through The Spence Children's Anxiety Scale (SCAS). All children underwent standardized observation of autistic traits (ADOS).

Results:

Increased reaction times (RT) to tactile stimuli are associated with hypo-reactivity, ($\beta = 2.6$; $p = 0.01$), which in turn correlates with higher autistic traits (ADOS; $\beta = 0.5$; $p = 0.04$) and elevated anxiety ($\beta = 0.1$ $p = 0.007$) (Figure B). Additionally, significant group differences were observed across all measures (all $p < 0.05$), supporting the use of the current assessment tools for sensory stratification. Specifically, autistic children exhibited greater hyper- ($\beta = 7.5$; $p = 0.001$) and hypo-reactivity ($\beta = 10.6$; $p = 0.001$), as well as heightened sensory-seeking behaviours ($\beta = 12.1$; $p < 0.001$), compared to their non-diagnosed peers. Parents also reported higher anxiety levels in autistic children relative to the others ($\beta = 19.0$; $p = 0.001$). Furthermore, while females demonstrated less sensory-seeking behaviour than males ($\beta = -4.5$; $p = 0.03$), they exhibited higher anxiety levels ($\beta = 8.0$; $p = 0.03$), which appeared to be linked to hypo-reactivity to sensory stimuli ($\beta = 2.0$; $p = 0.04$).

Conclusions:

Overall, our preliminary results indicate that notable sensory differences can be detected using the sensory battery developed in this study, and in particular, that psychophysical tablet-based approaches are both applicable and meaningful in preschool children. This work highlights the potential for stratifying autistic phenotypes based on sensory profiles and the contribution of bottom-up differences in sensory gating to sensory reactivity, and potential cascading impact on anxiety. These insights will enhance our understanding of the individual variations in the expression of autistic behaviours and facilitate tailored support to improve mental health outcomes and develop novel experimental approaches for young children with neurodevelopmental approaches.

**432.234 Task-Specific Upper Extremity Movements in Autistic Children during Feeding Activities**

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Background: Clinically-significant motor difficulties are highly prevalent in autistic children, affecting over 80% of individuals. These motor difficulties significantly impact activities of daily living, including self-feeding, dressing, and handwriting. Previous research has shown motor differences between autistic and neurotypical individuals in motor planning (e.g., reaction time) and motor execution (e.g., movement time, spatial efficiency, movement smoothness). Although this lab-based research has provided rich information on motor planning and execution, this work has been used in restricted tasks with simple movements (e.g., gripping, pointing, pressing a button) that are difficult to translate to clinical settings.

Objectives: We explored the differences in motor planning and motor execution of complex hand movements during feeding tasks between autistic and neurotypical children.

Methods: We examined hand movements in 17 autistic (Male=15, Female=2, $M_{age}=10.2$ yrs, $SD_{age}=2.9$, $Range_{age}=5-14$) and 25 neurotypical (Male=14, Female=11, $M_{age}=8.76$ yrs, $SD_{age}=3.36$, $Range_{age}=4-14$) children during feeding-related tasks. Participants wore form-fitting suits with 30 reflective markers placed on anatomical landmarks of the head, torso, and upper extremities. We used a 3D motion capture system (120Hz) to track and analyze hand movement using a marker placed on the second metacarpal during two tasks: drinking from a cup and feeding with a spoon. We assessed reaction time (i.e. latency before movement initiation), movement time (i.e., time from movement start to until stopping at the mouth), path length (i.e., spatial efficiency of movement), and jerk cost (i.e., smoothness of movement).

Results:

Reaction Time. Preliminary results revealed a main effect of task ($\chi^2=5.46$, $p=.019$) qualified by an interaction of task and age ($\chi^2=8.25$, $p=.004$) such that participant's reaction times decreased as age increased for the cup task ($b=-0.015$, $SE=0.005$, Figure 1A).

Movement Time. Preliminary results revealed a main effect of task ($\chi^2=653.03$, $p<.001$) such that the cup task was shorter than the spoon-to-mouth task ($b=-0.333$, $SE=0.013$, Figure 1B). There was also a main effect of age ($\chi^2=653.03$, $p=.017$) such that movement time increased as age increased ($b=0.027$, $SE=0.0111$, Figure 1B).

Path length. Preliminary results revealed a main effect of age ($\chi^2=20.70$, $p<.001$) such that path length increased as age increased ($b=32.205$, $SE=7.078$, Figure 1C). There was also a main effect of task ($\chi^2=209.80$, $p<.001$) such that participants used shorter path lengths for the cup task compared to the spoon-to-mouth task ($b=-169.790$, $SE=11.722$, Figure 1C).

Movement Smoothness. Preliminary results revealed a main effect of task ($\chi^2=346.99$, $p<.001$) such that participants had lower jerk cost in the cup task compared to the spoon-to-mouth task ($b=-1.212$, $SE=0.065$, Figure 1D). There was also a main effect of age ($\chi^2=7.41$, $p=.032$) qualified by an interaction ($\chi^2=4.59$, $p<.032$) between group and age such that autistic participants jerk cost increased as age increased ($b=0.068$, $SE=0.032$, Figure 1D).

Conclusions: Autistic children exhibit unique motor planning and coordination challenges during everyday feeding tasks, potentially hindering their capacity to perform activities of daily living independently. These findings indicate that motor challenges in autism may vary depending on the specific task demands. Future research should further examine the role of jerk cost on autistic children's motor execution in ecologically-valid tasks.



432.235 Neurophysiology of Perceptual Closure Abilities in Autistic and Neurotypical Control Children

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Background: Visual perceptual differences are well documented in autism spectrum disorder (ASD); however, gaps remain in our understanding of the neurobiological mechanisms underlying these observable sensory behaviors. In this study, we examined how the visual system fills in missing information during incomplete viewing conditions. Autistic individuals tend to focus on local object features at the expense of the global picture, which may result in visual perception difficulties during incomplete viewing conditions. We examined this process using a perceptual closure paradigm during electroencephalography (EEG) recording. Using this paradigm, our group previously identified a specific event-related potential (ERP) component, the closure negativity (N_{cl}), which reflects the process by which fragmented elements of complex objects are gradually filled-in, thus indexing the perceptual closure process.

Objectives: This study aims to define the neurophysiological underpinnings of the perceptual closure process in neurotypical development and examine whether there are global visual perception disruptions in autistic children.

Methods: Data collection is ongoing. Currently 11 autistic children and 14 neurotypical (NT) control children, ages 7-17 years have completed the perceptual closure paradigm during EEG recording. Participants are shown a series of image sets consisting of 8 images of progressively greater fragmentation. Images are presented from least complete (image 8) to most complete (image 1). Participants indicate whether they can identify the image; following identification, the image set is terminated. We examined the amplitude of the closure negativity (N_{cl}) and the P1 component at the level of the image identification (ID) and 3 levels prior. We also examined the accuracy of image identification and the mean level of image identification.

Results: Preliminary results show that there is an emerging N_{cl} in both groups, particularly in older participants. Autistic participants showed a greater P1 amplitude than NT controls across the ID and 3 prior levels. Regarding behavioral performance, NT controls were significantly more accurate in their image identification than autistic participants. However, ASD and NT control participants did not differ in their mean ID level for correct trials (level 3).

Conclusions: Overall, we found that neurotypical children are more accurate in their identification of fragmented images compared to autistic children. However, autistic and neurotypical children show no differences in the identification level suggesting a similar level of information is required to "close" or accurately perceive the object. Our preliminary results show an emerging N_{cl} in both the autistic and neurotypical children suggesting that perceptual closure abilities may reach adult levels later in development. We also found that both groups show greater modulation within the P1 component, which has not previously been observed in adults. However, the autistic participants showed a greater modulation of P1 and a greater P1 amplitude than NT controls across all levels examined. This finding may suggest a different process of object identification for children than adults and may suggest that autistic children interpret each fragmented image as different objects rather than interpreting the image set as a perceptual whole. Further examination is necessary to understand the development of local-global object perception in autistic children.

432.236 The Hotter the Better: A Large-Scale, Cross-Sectional Study of Associations between Body Temperature and Language, Nonverbal IQ, and Stereotyped Behaviors in Autistic Children Beyond the Fever Effect

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Background: Some autistic children exhibit transient behavioral improvements during fever. Children who reportedly improve with fever are significantly more likely to be minimally verbal, have lower nonverbal IQ (NVIQ), and show more stereotyped behaviors. The behavioral benefits of fever are postulated to result from two mechanistic pathways: immune response and increased body temperature itself. However, it remains unclear whether temperature in the non-fever range is associated with previously identified child characteristics. Additionally, studies have yet to identify which and how long stereotyped behaviors are related to temperature.

Objectives: Modeled after Grzadzinski et al. (2018), we examined associations between body temperature and language level, NVIQ, and stereotyped behaviors; we broadly expected positive effects of higher temperatures. We further explored relationships between temperature and two stereotyped behaviors (unusual sensory interests; hand/finger/complex mannerisms) across three timeframes (concurrent; recent; lifetime).

Methods: Participants were 1,213 autistic children from the Simons Simplex Collection (86.5% male; mean age: 9.05 years) who completed cognitive testing and the ADOS-2. They also completed a temperature protocol on the day of the ADOS-2, involving three separate measurements (30 seconds apart) of body temperature; for each participant, we calculated mean body temperature. To explore how temperature may be related to stereotyped behaviors measured at different timescales, we leveraged individual items universally measured on the ADOS-2 (concurrent), RBS-R (recent), and ADI-R (lifetime): unusual sensory interests and hand/finger/complex mannerisms. Participants' parents completed the RBS-R, which contained a Stereotyped Behavior subscale that assessed behaviors they observed in the past month, and ADI-R, which included codes to represent various stereotyped behaviors that had ever occurred. Individual items were dichotomized to indicate the absence or presence of the stereotyped behavior.

Results: ADOS-2 modules 1, 2, 3/4 were administered to 22.9%, 21.0%, and 56.1% of participants, respectively. Across the sample, participants varied in NVIQ ($M=81.9$, $SD=27.6$). Stereotyped Behavior subscale scores spanned the entire possible range (0-18; $M=4.77$, $SD=3.51$). Consistent with predictions, temperature differed across ADOS-2 modules ($F=3.73$, $p=.024$), with participants using fluent speech ($M=98.55^{\circ}\text{F}$) having significantly higher temperatures than minimally verbal participants ($M=98.43^{\circ}\text{F}$; $p=.020$). As expected, temperature and NVIQ were positively correlated ($r=.09$, $p=.002$). While in the predicted direction, temperature was negatively but not significantly related to Stereotyped Behavior subscale score ($r=-.03$, $p=.296$). Exploratory analyses revealed that temperature was significantly higher in children without ($M=98.60^{\circ}\text{F}$) than with ($M=98.49^{\circ}\text{F}$) recent unusual sensory interests ($t=2.42$, $p=.016$); temperature did not differ between children with or without concurrent ($t=0.09$, $p=.927$) or lifetime ($t=0.07$, $p=.942$) unusual sensory interests. In contrast, temperature did not differ significantly on the basis of concurrent ($t=1.33$, $p=.185$), recent ($t<1.45$, $ps>.149$), or lifetime ($t<0.17$, $ps>.868$) use of hand/finger/complex mannerisms.

Conclusions: This study highlights that body temperature in the non-fever range is significantly related to language level, NVIQ, and recent unusual sensory interests, extending prior work that documented behavioral improvements during fever in some autistic children. Future work may adopt longitudinal study designs (e.g., repeated temperature measurements and stereotyped behavior occurrences) to determine individual-specific associations, potentially laying the foundation for personalized, temperature-informed supports of challenging behaviors in autism.

432.237 The Impact of Gender on the Relationship between Autism Diagnostic Status and Selective Eating

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Background: Selective eating is a common occurrence that can lead to consequences such as obesity, mental health concerns, and eating disorders. Research has shown that selective eating is more prevalent in autistic children than non-autistic children; however, few studies have investigated this pattern in young adults. Young adult eating concerns often center around eating disorders, such as anorexia nervosa, bulimia nervosa, and a new DSM-5 disorder, avoidant/restrictive food intake disorder (ARFID). Emerging research has examined these eating disorders as well as broader eating behaviors, like selective eating, in young adults. There are some established gender differences in eating disorders with the greatest evidence supporting that women and girls have increased disordered eating in relation to body image. Less work has examined gender differences in ARFID or selective eating more broadly. The available research with children and adolescents suggests a higher rate of ARFID among boys compared to girls. Additionally, there may be gender-specific patterns of characteristics in ARFID, with girls being more likely to experience nutritional insufficiencies due to food selectivity, and boys more likely to refuse eating due to sensory sensitivities. Importantly, no studies have assessed gender-based differences in young adulthood. Furthermore, studies have yet to look at specific gender differences in selective eating behaviors in autistic and non-autistic young adults.

Objectives: Our study assessed gender-based differences in selective eating patterns in autistic and non-autistic young adults.

Methods: A sample of 425 autistic and non-autistic young adults (76.2% female identifying) ranging from 18-27 years old was recruited using an undergraduate student sample, social media, and Research Match. Participants completed multiple self-report measures to evaluate different aspects of selective eating, including food neophobia, individual food preference, food quality preferences, and ARFID symptoms.

Results: Autistic young adults reported greater individual food selectivity ($F = 191.70$, $p < .001$), food quality selectivity ($F = 145.37$, $p < .001$), food neophobia ($F = 88.46$, $p < .001$), and ARFID symptoms ($F = 161.83$, $p < .001$). In contrast, there were no significant differences between men and women's reports of selective eating across the four measures: individual food selectivity ($F = .91$, $p = .34$), food quality selectivity ($F = .004$, $p = .95$), food neophobia ($F = 2.69$, $p = .10$), and ARFID symptoms ($F = .21$, $p = .65$). Only individual food selectivity yielded a significant interaction effect of gender and diagnostic status ($F = 17.45$, $p < .001$).

Conclusions: Autistic young adults reported higher rates of selective eating than non-autistic young adults; however, there were no gender differences in selective eating patterns across all four measures. When assessing the interaction of gender and diagnostic status, there was only an effect on individual food selectivity which warrants further investigation. Future directions include assessing other factors that may influence the relationship between autism diagnostic status and selective eating.

432.238 The Impact of Sensory Reactivity on Anxiety in Autistic and Non-Autistic Young Adults: A Follow-up Study

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Background: Sensory reactivity differences and anxiety symptoms are highly prevalent and meaningful in the lives of autistic people, leading to profound impacts on daily functioning and well-being. While sensory reactivity differences have been implicated as a potential risk factor for the development of anxiety in autistic children, research has yet to explore the predictive relationship of sensory symptoms on internalizing pathology in autistic adolescents and adults.

Objectives: The present study sought to examine the developmental trajectories of sensory reactivity and anxiety in autistic and non-autistic people, and their relationships over time, to better understand the impact of sensory experiences and internalizing symptoms on autistic youth as they transition into adulthood.

Methods: This study followed up 12 autistic adults (Mean IQ = 108) and 13 non-autistic adults (Mean IQ = 115), between the ages of 20-26, who participated in a previous study on sensory reactivity at 12-17 years old. Participants completed the same self-report measures at both time points. The Adolescent/Adult Sensory Profile (AASP) and the Brain Body Center Sensory Scales (BBCSS) assessed sensory hyperreactivity, hyporeactivity, and seeking behavior. Anxiety was measured at each time point using the Screen for Anxiety Related Disorders (child or adult version).

Results: ANOVAs demonstrated that autistic adults experience greater sensory hyperreactivity (BBCSS: $F = 22.94, p < .001$; AASP: $F = 8.24, p = .009$) and hyporeactivity (AASP: $F = 12.62, p = .002$) compared to non-autistic adults. Looking over time, repeated measures ANOVAs revealed that for both autistic and non-autistic groups, sensory hyperreactivity and sensory-seeking behaviors remained stable into emerging adulthood (time main effects all *ns*), while sensory hyporeactivity decreased over time ($F = 64.8, p < .001$). None of the group x time interactions were significant. Autistic adults endorsed marginally higher levels of anxiety than non-autistic adults ($F = 4.01, p = .058$). Both groups demonstrated an increase in anxiety symptoms from adolescence to adulthood ($F = 21.0, p < .001$; group x time interaction, *ns*). Looking at the relationships between domains, both measures of sensory hyperreactivity were significantly correlated with anxiety in autistic adults (BBCSS: $r = .60, p = .05$, AASP: $r = .63, p = .04$). Pearson correlations were used to examine the influence of sensory reactivity and anxiety symptoms on each other over time. Sensory hyperreactivity in adolescence, as measured by the BBCSS Hypersensitivity composite, accounted for 44% of the variance in adult anxiety in the autistic group ($r = .66, p = .03$). Conversely, adolescent anxiety did not predict sensory hyperreactivity in autistic adults (BBCSS: $r = .35, p = .29$; AASP: $r = .06, p = .86$).

Conclusions: Results indicate that autistic young adults continue to experience elevated rates of sensory reactivity differences and anxiety symptoms. Importantly, sensory hyperreactivity in adolescence was identified as a significant unidirectional predictor of the development of anxiety symptoms in autistic adults. This suggests working with autistic teens to identify their specific sensory needs and develop personalized strategies may help reduce the impact of sensory hyperreactivity on their mental health over time.

432.239 The Intersection of Food Selectivity and Obesity in Autism Spectrum Disorder: Insights for Treatment

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Background: For autistic people, obesity prevalence is concerning relative to non-autistic peers, exacerbating already elevated risk for negative health sequelae and chronic health conditions (e.g., diabetes, stroke). Autism-specific obesity treatment guidance and interventions exist. However, unique eating phenotypes observed in autism—particularly a high prevalence of food selectivity—have not been clearly integrated into treatment. Food selectivity in the presence of obesity in autism may be a “double hit” and significant barrier to treatment success. A critical next step is the integration of existing food selectivity treatment programs tailored for autistic youth, such as the Building Up Food Flexibility and Exposure Treatment (BUFFET) Program, into obesity treatment programs.

Objectives: (1) Examine caregiver and youth perspectives on the role of food selectivity in treatment for obesity in autistic youth. (2) Characterize the theoretical underpinnings (behavioral flexibility, anxiety, and sensory differences that underlie food selectivity) of BUFFET in autistic youth with obesity.

Methods: Caregivers of 69 autistic youth 6-17 years (mean=12.5, SD=3.1; 34M:13F, 2 not-disclosed) with BMI percentile in the range of overweight (N=4) or obesity (N=65), described as ‘with obesity,’ completed a survey to examine the influence of food selectivity on engagement with treatment for obesity in autism. A subset of autistic youth (N=44) self-reported on survey questions. Caregivers completed assessments to characterize their child’s presentation on constructs theoretically foundational to BUFFET, including the Flexibility Scale-Revised (behavioral flexibility), Parent-Rated Anxiety Scale for Youth with Autism Spectrum Disorder (anxiety), and questions on anxiety in eating contexts (eating-specific anxiety) and sensitivity to taste, smell, and food texture in eating contexts (sensory differences that underlie food selectivity).

Results: 72% of caregivers described their autistic child with obesity as a picky eater. 75% of self-reporting autistic youth with obesity described themselves as a picky eater, with 86% caregiver-youth agreement on food selectivity status. A high proportion of caregivers reported that food selectivity impacts their child’s health (88%) and weight (90%). Youth themselves also report that food selectivity impacts their health (64%) and weight (86%). Many (81%) caregivers described food selectivity as a barrier to their child making positive eating changes, despite most (88%) having doctors who discussed food selectivity in conversations about weight management.

A series of ANOVAs revealed that relative to autistic youth with obesity *without* food selectivity, autistic youth with obesity *with* food selectivity showed higher eating-specific anxiety, $F(1,66)=10.3, p=0.002, h_p^2=0.14$ and greater sensory differences that underlie food selectivity, $F(1,64)=17.6, p<0.001, h_p^2=0.22$, as well as trends toward higher overall anxiety, $F(1,46)=3.7, p=0.06, h_p^2=0.07$, and greater difficulty with behavioral flexibility in everyday life, $F(1,45)=3.6, p=0.06, h_p^2=0.08$, and in the context of rituals and routines, $F(1,48)=3.2, p=0.08, h_p^2=0.06$.

Conclusions: Results suggest that autistic youth with obesity and food selectivity demonstrate a profile of eating-related anxiety, sensory differences underlying food selectivity, and perhaps behavioral flexibility that aligns with constructs and treatment targets of food selectivity treatment for autistic youth. Integration of a treatment like BUFFET with existing obesity treatments could address an unmet need identified by caregivers and autistic youth with obesity in this study.

432.240 The Relationship between Sensory Processing and Anxiety in Autistic Adults: A Systematic Review

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Background: Sensory processing differences are prevalent among autistic adults and can profoundly influence other behaviors, such as anxiety, and overall quality of life. While numerous studies have explored the relationship between sensory processing differences and anxiety in children on the autism spectrum, there remains a critical need to examine this relationship within the adult population.

Objectives: This systematic review synthesizes existing research on the association between sensory processing and anxiety in adults on the autism spectrum. Additionally, it identifies commonly utilized measures of sensory processing and anxiety in this population.

Methods: A comprehensive literature search was conducted following the Preferred Reporting Items for Systematic Reviews (PRISMA) guidelines. Databases searched included PubMed, PsychINFO, Embase, CINAHL, Scopus, and Web of Science. Results were imported into Covidence for further screening. Two independent reviewers screened titles, abstracts, and full-text articles based on the following inclusion criteria: (1) participants aged 18 and older with a formal diagnosis of autism, (2) use of outcome measures for sensory processing and anxiety, and (3) statistical analyses examining correlations between sensory processing and anxiety.

Results: Of the 3,076 articles screened, 13 peer-reviewed studies met the inclusion criteria, examining the relationship between sensory processing differences and anxiety in autistic adults. Generalized anxiety was assessed in 11 articles (85%), while two studies (15%) focused on specific anxiety types, including pain anxiety and social anxiety. The most frequently used anxiety measures were the Penn State Worry Questionnaire (PSWQ), Hospital Anxiety and Depression Scale (HADS), Beck Anxiety Inventory (BAI), and Spielberger State/Trait Anxiety Inventory (STAI). The Adolescent/Adult Sensory Profile (AASP) was the most common tool for assessing sensory processing, used in six articles (46%). A significant relationship between sensory processing differences and anxiety was found in 12 studies (92%), with six studies (46%) reporting that heightened sensory sensitivities were associated with increased anxiety levels. Two studies (15%) demonstrated a positive correlation between sensory avoidance and anxiety. While evidence linking sensory seeking and low registration to anxiety was limited, one study (8%) suggested that anxiety might drive sensory-seeking behaviors. Additionally, two studies (15%) identified anxiety as a mediator between sensory processing and other behaviors, such as restrictive and repetitive behaviors (RRBs) and problem behaviors.

Conclusions: The studies suggest a strong association between sensory processing and anxiety in autistic adults. Future longitudinal research is needed to clarify the causal relationship between various sensory processing profiles and anxiety. Sensory sensitivity, in particular, warrants closer examination regarding its influence on anxiety. Additionally, future research should focus on the impact of sensory processing on specific anxiety types to better inform the development of targeted therapeutic interventions that address the underlying causes of anxiety-related behaviors.

432.241 Theta-Gamma and Alpha-Gamma Coupling in Response to Auditory Stimuli in Rett Syndrome

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Background: Rett syndrome (RTT) is a neurodevelopmental disorder that shares a number of features with autism, including altered sensory processing in both the visual and auditory domains. RTT may therefore serve as a useful model to gain insight into atypical sensory processing in autism. In particular, electroencephalography (EEG) based measures of phase-amplitude coupling can reflect how the brain integrates and segregates incoming sensory information. Our previous work in electroencephalography (EEG) at rest has shown increased theta-gamma and alpha-gamma phase-amplitude coupling in RTT, but this has not previously been studied in response to sensory stimuli.

Objectives: This study is a preliminary analysis to determine whether there is altered coupling in theta-gamma and alpha-gamma frequencies in response to auditory stimuli in participants with RTT compared to typically developing (TD) controls.

Methods: This experiment involved 26 RTT and 27 TD participants between the ages of 1-50. All RTT participants had a clinical diagnosis of classic or atypical RTT and a pathogenic variant in the MECP2 gene, and TD participants were approximately age and sex matched to RTT participants. EEG data were collected while participants underwent an auditory evoked potential paradigm, during which they listened to 250 500-Hz tones at 60 dB with jittered interstimulus intervals between 1-3 seconds. EEG data were preprocessed through the Harvard Automated Processing Pipeline for EEG (HAPPE) in the Batch Electroencephalography Automated Processing Platform (BEAPP). 200 trials from each participant were randomly selected for analysis. PAC using the Tort method was applied to the data, with the analysis intervals for each trial beginning at stimulus onset and ending at 800 ms post-stimulus. The average raw modulation indices (MI) in the fronto-central channels were averaged across RTT participants and TD participants separately, and the differences between the RTT and TD groups were calculated.

Results: The RTT group exhibited its highest coupling at the theta/high-gamma frequency pairs. The TD group exhibited its highest coupling at the low-theta frequencies across the gamma spectrum. When comparing group MI differences, we observe that PAC across most frequency pairs is higher in the RTT group than the TD group, except for the low-theta/low-gamma pairs. The greatest increase in PAC between the RTT and TD groups occurs in the theta/high-gamma frequency pairs.

Conclusions: We observed increased theta-gamma PAC at high-gamma frequencies in response to sensory stimuli in RTT. Future work using computational modeling will help to understand the circuitry underlying this response. If this altered pattern is due to shared underlying mechanisms (e.g., alterations in function of specific subtypes of inhibitory interneurons), we would expect to see the same altered pattern of theta-gamma coupling in patients with autism who also experience dampened activity in these neurons. Abnormally high theta-gamma coupling in the high-gamma frequencies could therefore serve as a biomarker in autism of this particular type of altered sensory processing.



432.242 Toe Walking Is Associated with Greater Motor, Cognitive, Language, and Sensory Impairment in Autism: Results from a Neural Network Analysis

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Background: Autistic children and adolescents frequently exhibit motor abnormalities, including toe walking (TW). Previous research has found persistent TW (i.e., TW that would not resolve spontaneously by 3-7 years of age) associated with greater cognitive impairment, language delay, and orthopedic complications, while evidence of abnormal sensory processing is less consistent.

Objectives: The goal of this study is to outline the overall schema of natural relationships between clinical variables and Short Sensory Profile (SSP) scores in a sample of autistic children and adolescents with and without TW, by applying artificial neural networks

Methods: 256 clinical variables across four domains (prenatal-perinatal issues, medical and neurological features, developmental characteristics, family history) were retrieved for analysis from a cohort of 112 autistic children and adolescents assessed for TW (see Camia et al., 2024, doi: 10.1016/j.rasd.2024.102457). Each domain was processed using Auto-CM, a fourth-generation auto-associative neural network. After training, this system developed weights that reflect the strength of associations between all variables. A minimum spanning tree filter was then applied to the resulting weight matrix, allowing for a graphical representation of the strongest connections between variables, in other words their semantic connectivity map. Preliminary analyses performed on each domain identified 31 clinical variables with up to one degree of separation from "TW-present"/"TW-absent". Six variables were then dichotomized yielding a total of 41 clinical variables. Final analyses were then performed on complete data sets applying Auto-CM: (a) to these 41 clinical variables on a sample of 79 patients (N=46 with and 33 without TW), and (b) by adding also 24 variables, three for each SSP domain (clinical vs borderline vs normal) and for its total score, available for 61 patients (36 with TW and 25 without TW).

Results: The semantic connectivity map generated by Auto-CM revealed a clear separation between presence/absence of TW: (a) Analyzing only clinical variables, "TW-present" was identified as a hub node, linked to motor coordination disorder, abnormal cranial conformation, dysmorphisms, reduced pain sensitivity, hypersensitivity of other senses, sensory self-stimulation, hyperactivity, stereotypic behaviors, and severe autism. TW-absence was linked to presence of imitation/pretend play, mild autism severity, and better language skills, both receptive and expressive. (b) Including also SSP variables, auto-CM generated a map also connecting TW with a string of SSP scores in the clinical range (hyporeactivity, auditory filtering, tactile sensitivity, etc), counteracted by normal SSP scores linked to "TW-absent".

Conclusions: These results confirm the greater severity of motor, cognitive, social, and verbal impairment associated with TW. Sensory abnormalities, linked to TW here but not in our prior study, are likely part of a constellation of signs and symptoms expressing a more pervasive and profound derangement of neurodevelopmental processes, rather than a direct cause of TW. More research will be necessary to understand the neural substrates of TW in autism. Advanced computational tools, like Auto-CM, are indeed helpful in overviewing and partitioning complex behavioral phenotypes.

432.243 Transdiagnostic Investigation of the Link between Anxiety, Insistence on Sameness Behaviours, and Compulsions

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Background: Although insistence on sameness (IS) and compulsions occur across a wide range of clinical conditions, they are typically only examined within the confines of specific disorders. Commonly described differences in these behaviours across diagnoses likely oversimplify complexities and do not address well-established heterogeneity and/or high co-occurrence. For example, compulsions in obsessive-compulsive disorder (OCD) are said to differ from compulsions in autism in that they are performed to relieve distress. However, many autistic individuals describe performing ritualised behaviours precisely for this function and/or report considerable distress caused by interruptions to behaviours. Indeed, theoretical accounts of IS and compulsions across different diagnostic groups bear many similarities, consistently identifying anxiety as a key mechanism. However, as transdiagnostic investigations of these behaviours have been limited to date, it remains unclear whether anxiety shows a similar pattern of association with IS and compulsions within and across diagnostic groups.

Objectives: To examine the endorsement IS and compulsions across diagnostic groups and explore whether anxiety shows different patterns of associations with IS or compulsions within and across diagnostic categories.

Methods: Data obtained from the Healthy Brain Network database comprised a transdiagnostic sample of 1852 youth ($M_{age}=10.36(3.40)$; 591 females) diagnosed with autism ($N=387$), oppositional defiant/conduct disorder (ODD/CD; $N=267$), attention-deficit hyperactivity disorder (ADHD; $N=931$), OCD ($N=59$), or internalizing disorders ($N=208$). IS and compulsions were assessed using the Repetitive Behaviour Scale-Revised (RBS-R) and anxiety using the Screen for Child Anxiety Related Disorders – Parent Version (SCARED-P). Fisher's r to z comparison was used to compare the strength of correlations.

Results: As hypothesised, anxiety, IS, and compulsion levels differed significantly across diagnostic groups, despite all features being commonly endorsed across each clinical condition. The autism group scored the highest on IS ($F=57.12$; $p<.001$) and the autism and OCD/Tic groups scored the highest on compulsions ($F=37.92$; $p<.001$). The autism, ODD/CD and internalizing groups showed significantly higher anxiety than the ADHD group ($F=7.91$; $p<.001$).

Within-group comparisons revealed that anxiety showed a slightly stronger correlation with IS than compulsions in the ASD ($r=.50$ vs $.44$), ADHD ($r=.42$ vs $.36$), and OCD/Tic groups ($r=.58$ vs $.40$), but not the ODD/CD ($r=.43$ vs $.40$), or internalizing groups ($r=.42$ vs $.50$). Despite differences being significant, Cohen's q suggested only a small effect for the OCD/Tic group ($q=.24$) and no effect for other groups ($q<.10$). Between group comparisons found that the strength of association between anxiety and IS ($r=.42$ to $.58$) did not differ between groups, nor did the association between anxiety and compulsions ($r=.36$ to $.50$).

Conclusions: High endorsement of IS, compulsions and anxiety across all diagnostic groups affirms the transdiagnostic nature of these phenomena. Although further research is needed, anxiety showing comparable strength of associations with IS and compulsions within and across diagnostic groups, adds to a growing body of evidence suggesting that IS and compulsions are transdiagnostic features that may have shared aetiologies across diagnostic conditions.

432.244 Understanding Sensory Processing and Pain in Children with Autism Spectrum Disorder

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Background: There is currently a critical gap in understanding pain perception in children with Autism Spectrum Disorder (ASD). While sensory processing differences are increasingly recognized as a core feature of ASD and also occur in children with Sensory Processing Concerns (SPC) who do not meet criteria for ASD, there remains a limited understanding of how these differences contribute the sensory perception of pain.

Underrecognition of pain experiences may result in insufficient pain relief, compromised quality of life, and preservation of the cycle of sensory challenges and pain experiences. In young or minimally verbal children, behavioral reactions to pain provide clues to the child's pain experience and thus a springboard for linking biology and behavior of pain response. Understanding relations between pain reactivity, sensory sensitivity to different stimuli, social communication, and cognition is crucial for informing tailored interventions to optimize pain management strategies for children with ASD and SPC.

Objectives: We aim to investigate how pain reactivity correlates with other measures of sensory processing, social communication, and cognition by collecting a series of clinician observation and parent report measures.

Methods: Data collection for this study is ongoing, with a current sample size of 48 3- to 4-year-old children, 14 typically developing (TD), 13 SPC, and 21 ASD (total target $N=75$). We derived an approximation of pain reactivity using elements of the Sensory Assessment for Neurodevelopmental Disorders (SAND; a clinical observation and parent report that measures sensory hyperreactivity, hyporeactivity, and seeking behaviors in response to various sensory stimuli) and the Sensory Profile 2 (SP-2; a parent report of a child's sensory processing abilities and their impact on daily functioning). We calculated a pain reactivity aggregate score using the SAND hyperreactivity total score, SAND total tactile score, and response on the "seems unaware of pain" item of the SP-2, following z score transformation, as these metrics were sufficiently intercorrelated to warrant aggregation. Participants' social communication and broader cognitive skills were evaluated using the Autism Diagnostic Observation Schedule 2 (ADOS-2), Social Communication Questionnaire (SCQ), and the Mullen Scales of Early Learning. We ran an ANOVA to determine if our groups differed in pain reactivity and a series of regression and correlation analyses on sensory measures, cognition, and social communication. **Results:** There were no significant group differences in pain reactivity as measured by the pain aggregate score $F=1.98$, $p=0.166$, $\eta^2=0.04$. Pain aggregate scores were significantly positively correlated with the ADOS social affect calibrated severity score, $r=0.31$, $p=0.02$, such that higher pain reactivity corresponded with higher social affect severity scores.

Conclusions: These findings suggest a relation between social communication skills and pain reactivity in children with and without autism and/or sensory processing concerns. This research has the potential to enhance our understanding of pain perception in children with ASD and SPC, paving the way for the development of validated questionnaires and targeted interventions. Further characterization of pain reactivity with a Nociceptive Behavior Response parent questionnaire is currently ongoing and will also be discussed.

432.245 Validation of Markerless Video-Based Gait Analysis Using Pose Estimation in Toddlers with and without Neurodevelopmental Disorders

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Background: The onset of locomotion is a critical motor milestone and increases engagement with the environment. Toddlers with neurodevelopmental disabilities often have atypical motor development in the form of delayed motor milestones, atypical gait, and poor coordination or balance. These motor impairments can impact the development of later fundamental motor skills, adaptive functioning, language, and social communication. Standardized motor assessments are limited for measuring motor development as they are subjective and can be difficult to ascertain in children with neurodevelopmental disabilities due to the cognition and attention required to complete the tasks. Video-based gait analysis using pose estimation offers an alternative that is objective, scalable, and easier for children to complete, yet very little work has been done to determine its accuracy in pediatric populations.

Objectives: The goal of this study is to (1) demonstrate the feasibility of using pose estimation to perform gait analysis in children with and without neurodevelopmental disabilities and (2) assess the validity of OpenPose, a markerless movement analysis software, for accomplishing this task. Specifically, we focus on toddlers with a diagnosis of autism, non-autism developmental concerns, a genetic neurodevelopmental syndrome, or typical development. We hypothesized that OpenPose analysis would yield spatiotemporal gait videos that were significantly correlated with those calculated using an instrumented gait mat.

Methods: We analyzed the overground gait of 112 toddlers (M: 30 months, SD: 8 months) with and without developmental disabilities using the ProtoKinetics Zeno Walkway system. Simultaneously recorded videos were processed in OpenPose to perform pose estimation and a custom MATLAB workflow to calculate average spatiotemporal gait parameters. Pearson correlations were used to compare OpenPose with the Zeno Walkway for velocity, step length, and step time. A Bland-Altman analysis (difference vs. average) was used to assess the agreement between methodologies and determine the difference of means. Developmental levels were assessed using the Mullen Scales of Early Learning.

Results: Our analysis included children with autism ($n = 77$), non-autism developmental concerns ($n = 6$), Tuberous sclerosis complex ($n = 13$), 22q deletion ($n = 1$), and typical development ($n = 15$). Mullen early learning composite scores ranged from 49 to 95 ($m = 80.91$, $sd = 26.68$). Velocity ($r = 0.87$, $p < 0.0001$), step length ($r = 0.79$, $p < 0.0001$), and step time ($r = 0.96$, $p < 0.0001$) were all highly correlated between OpenPose and the Zeno Walkway, with an absolute difference of means of 0.04 m/s, 0.03 m, and 0.01 s, respectively.

Conclusions: Our results suggest that video-based gait analysis using pose estimation is accurate in toddlers with a range of developmental levels. Video-based gait analysis shows promising qualities for making motor research more widely available, as it is low cost and can be implemented for remote data collection in natural environments such as a participant's home. These advantages open possibilities for using repeated measures to increase our knowledge of how gait ability changes over time in pediatric populations and improve clinical screening tools, particularly in those with neurodevelopmental disabilities who exhibit motor impairments.



432.247 What Do Autistic Children Who Are Interested in Letters and Numbers Do with Them?

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Background:

A recent study showed that 37% of autistic children exhibit an intense or exclusive interest in letters at the time of diagnosis (Ostrolenk et al., 2024). This interest is manifested mainly through non-social behaviours in autistic children, such as reading alone, and through social behaviours in typically developing (TD) children. Other findings highlighted that language development in autistic children diverges from neurotypical patterns, with joint attention levels prior to oral language development not predicting outcomes in autism (Kissine et al., 2023). Despite these differences, most autistic children develop functional oral language, pointing to alternative pathways of language acquisition, which may be through their early interest in written language.

Objectives:

This study aimed to qualitatively investigate the atypical manifestations of this interest in autistic compared to TD children. We were particularly interested in determining if and how this interest can benefit children and their families, and understanding the relationship between written and oral language development.

Methods:

The participants were the parents of 138 autistic children (77% male, $M_{age}=51.31$ months, $SD=11.72$, range=24-80) and 76 TD children (53% male, $M_{age}=47.54$ months, $SD=15.74$, range=24-83) between 2 and 6 years old. Most of the autistic children (84%) were non-speaking or minimally speaking. Families were recruited from an autism assessment clinic (autistic group) and daycares in the same geographical area (TD group). Parents participated in a 45-minute semi-structured interview on their child's interest in letters and numbers, the manifestations of these interests, the parental attitude towards it, and the child's oral language. We used the notes and audio recording taken by the interviewers during the questionnaire to transcribe the parents' answers. An inductive thematic analysis (Braun & Clarke, 2006) was performed on the qualitative data by two of the authors to establish recurring themes. To further investigate non-speaking autistic children, we created a subgroup whose parents reported that they did not communicate using spoken words at all.

Results:

Eight themes were identified: atypical behaviors related to written material, emotional attachment to letters and numbers, language acquisition, use of screens, solitary behavior, reduction of the interest over time, parental attitudes, and other special abilities. Thirty-three autistic children were identified as non-speaking. Of them, 18% had an intense or exclusive interest in letters and numbers, 27% could count, 18% would sing the alphabet song, and 24% would name letters. Three non-speaking children could write letters and numbers, two could recognize some written words and one could read.

Conclusions:

This study reveals that the interest in written material manifests itself in atypical ways in autism and is not comparable to the development of an interest in reading in a typically developing context. It also appears that this interest, when present, can be a source of well-being and lead to the acquisition of new skills, potentially developing into hyperlexia. Surprising observations in otherwise non-speaking children suggest that written material may represent an alternative pathway for language acquisition in autistic children. This calls for further investigation of these intense interests and the development of tools to better identify them.



432.248 What Is the Developmental Trajectory of Each Repetitive Behavior and Intense Interest? Do They Vary According to Nviiq? a Longitudinal Account of Repetitive Behaviors and Object Exploration during a Stimulating and Adapted Play Situation.

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Background:

A growing body of literature supports the positive value of intense interests (II; Wood, 2023). Similarly, studies have shown that repetitive behaviors (RB) do not interfere with exploration nor learning opportunities (Jacques et al., 2018). However, little is known about their trajectory throughout development. Moreover, RB and II are often studied together, primarily through parent report questionnaires. Using a natural context tailored to autistic characteristics, such as the Montreal Stimulating Play Situation (MSPS), could better capture RB and II throughout the developmental trajectory of autistic children.

Objectives:

Document the developmental trajectory of RB and II in autistic children. More precisely, we aim to 1- document each RB and object explored (referring to II) by autistic children during the preschool and school versions of the MSPS; 2- determine whether this trajectory is modulated by nonverbal IQ (NVIQ).

Methods:

Data were collected from 23 autistic children exposed to the MSPS preschool version (M=50.09 months) and school version (M=130.52 months), recruited through the Autism clinic at Rivière-des-Prairies hospital in Montreal. Exploration of 40 objects of interest, and 48 behaviors were coded by two naive raters using Observer XT© through a systematic inter-rater agreement process. RB and object exploration were analysed in frequency, duration and proportion, with all three used to determine the significance. Wilcoxon Signed-Rank and McNemar tests were used to compare RB and object exploration across measurement times. Mixed longitudinal regressions were used to determine how NVIQ (Raven's 2) predicts changes in RB and object exploration across measurement times. Holm-Bonferroni corrections led to an adjusted alpha level of 0.001.

Results:

Regarding RB, *lateral glances*, *pressing*, and *rolling* objects significantly decreased from preschool- to school-age. While not significant throughout measurement times, other RB showed a general decrease, with the exception of *grouping objects according to their perceptual properties*, *throwing*, and *turning objects*, which remained prevalent and stable. Mixed longitudinal regressions show that higher NVIQ scores were linked to a significant decrease of several RB. Results also suggest that higher cognitive abilities moderated the effect of time on RB, reducing variations.

Regarding object exploration, a significant decrease was observed for *sound embedding objects*. *Letters and numbers*, *boat* (hammer and balls), *big abacus*, and *tactile balls* remained highly explored across measurement times. Mixed longitudinal regressions revealed contradictory patterns, with higher NVIQ scores leading to both increases and decreases in exploration, depending on object type. The findings also suggest that higher cognitive abilities attenuated the impact of time on the exploration of different objects.

Conclusions:

This study suggests that despite a general decline in RB from preschool to school age, distinct patterns are observed when RB are analyzed individually, and when NVIQ is considered. It also underlines that interests in literacy and sensory objects are stable throughout time, and more importantly, that NVIQ modulates object exploration. These findings highlight the importance of studying each RB's trajectory individually. It also suggests that RB and II trajectories are linked to other characteristics such as intelligence, language and motor skills.



432.249 Why Do I Feel Overwhelmed? Integrating Neural and Subjective Responses to Commonly Employed Visual and Haptic Stimuli with Anxiety in Autistic Individuals

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Background: Autistic people often describe feeling overwhelmed in response to common sensory stimuli. As this experience is unusual, and brain imaging studies of sensory stimulation rarely describe pathways from simple visual, auditory, or tactile stimulation to intense recruitment of emotional and cognitive resources, autistic people's experiences are often between misunderstood and not believed.

Objectives: Greg Siegle, an autistic neuroscientist, will use neuroimaging data from the Pittsburgh Autism Center of Excellence, to relate how autistic people respond subjectively to neural reactions in response to common sensory stimuli at a group and individual, clinical, and narrative level.

Methods: Participants included N=59 study-diagnosed autistic and N=21 verified non-autistic individuals (22 Male (14 autistic), 33 female (23 autistic), 11 non-binary (10 autistic), 13 other (12 autistic), age mean = 33 range = 19-61, N=57 white (47 autistic), 11 Black (6 autistic), 4 Asian (2 autistic), 8 other (5 autistic)). Functional magnetic resonance imaging (fMRI; 3T Siemens Prisma) was completed during a block design using flashing checkerboards and haptic vibration, which are common in cognitive neuroscience, alone and together. Data were processed using HalfPipe (Waller et al, 2022; slice timing, motion correction, cross registration to the MNI152NLin2009cAsym template, 125s fWHM high pass filter, grand mean scaling, ICA-AROMA outlier removal, motion, white matter, csf confound regressors). Block-regressors were convolved with a double gamma hemodynamic response to produce single subject condition-related regressor contrasts, which were averaged across 12 a priori meta-analytically derived (Neurosynth; Yarakoni et al, 2012) functionally homogeneous networks ("task", "social", "sensation", "self", "salience", "pain", "motor", "memory", "interoceptive", "executive", "emotion", "default", "attention", and "arousal"). Means, standard deviations, and distribution shapes (via Siegel-Tukey test) were compared across groups. After the MRI assessment, participants were shown their brain reactions as bar graphs for the a priori networks, and were given the opportunity to interpret the emergent pattern of brain responses narratively. Individual differences in neural reactivity were correlated with self-reported anxiety severity (Generalized Anxiety Disorder (GAD)-7; Spitzer et al, 2006).

Results: Compared to non-autistic participants, autistic participants' responses to sensory stimuli had a long-tailed distributions in many networks. There were disproportionate numbers of autistic participants with both higher and lower-than expected reactivity to sensory stimuli in multiple not-conventionally-sensory-processing-related brain networks, e.g., self, memory. Lower anxiety autistic participants were more reactive than non-autistic participants. Higher anxiety autistic individuals were less reactive than non-autistic participants. This variation was consistent with how participants saw their own reactions at an individual level.

Conclusions: Our data suggest that autistic individuals have diffuse variable, but unique neural reactivity, consistent with emotional and personally relevant reactions to nominally sensory stimuli. Their reactions varied with anxiety severity. Lower anxiety individuals were more reactive; higher anxiety individuals may be more prone to shutting down. Autistic individuals' brain reactions largely reflect their narratives. As autistic individuals may have either very high or low neural reactivity to sensory stimuli, and have insight into these reactions suggests the utility of asking autistic people about their unique sensory experiences and accounting for their anxiety in tailoring sensory-friendly environments and interventions.

432.250 "I Was Told It Wouldn't Hurt at All": A Qualitative Study on Pain Experiences and Pain-Related Anxiety in Autistic Adults.

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Background:

Sensory processing differences are well-documented in autistic individuals, but we know little about how autistic individuals experience pain specifically. In experimental studies, autistic adults show increased pain sensitivity and endorse more pain-related anxiety symptoms. Anxiety disorders are common co-occurring conditions for autistic people. Qualitative studies of medical interactions in autistic adults have reported that autistic people find it hard to describe their pain to medical professionals, putting them at risk for pain mismanagement. There are no existing qualitative studies specifically addressing how autistic adults experience and reflect on their pain.

Objectives:

In the current study, we aimed to (1) characterize pain experiences and (2) describe the influence of anxiety on pain for autistic adults.

Methods:

We report preliminary data from a sub-sample of autistic adult participants (N=10, 6 Female, Ages 20-44 years old) that were given a semi-structured interview following their participation in a sensory and pain psychophysics study. Interview questions probed pain experiences, medical visits for pain, and experiences of autistic adults participating in pain research. Using thematic analysis, we iteratively developed a coding framework based on engagement with the data.

Results:

Participants reported that their pain experiences seemed to differ from others' reported or expected pain experience ("I was told it wouldn't hurt at all and it was very painful.") which led to diminished trust in others' descriptions of pain and reduced ability to anticipate pain ("I really don't know how much pain you're supposed to be in on a daily basis"). Many stated that anticipation of pain increased their pain intensity. However, when pain was unexpected, many noted that they may not even notice the pain ("I barely felt that"). In anticipation of painful events in medical settings, the anticipation and experience of "sensory overload" contributed to increased anxiety around potentially painful events. For some, pain increased worries about undiagnosed conditions ("what if it's something bigger... cancer?").

Conclusions:

Given high rates of chronic pain conditions and anxiety disorders in autistic individuals, this work highlights the need to understand the relationship of pain and anxiety for autistic adults and to develop targeted treatments for pain-related anxiety.

432.252 Relationship between Postural Control and Vision in Children and Adolescents with Autism Spectrum Disorder. a Scoping Review

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Background: Motor impairments are frequently observed in individuals with autism spectrum disorder (ASD). Among motor issues, postural control can be found impaired and may also be influenced by visual stimuli. To our knowledge, the results of the studies that assessed the influence of vision on postural control in children and adolescents with ASD were not systematically searched and summarized.

Objectives: We conducted a scoping review to provide a comprehensive picture of the relationship between vision and postural control.

Methods: The scoping review was performed using the Preferred Reporting Items for Systematic Reviews and Meta-analysis Protocol Extension for Scoping Reviews, and the review protocol was registered a priori on the Open Science Framework. The literature search was performed in PubMed, Scopus, Web of Sciences, Cinhal, Embase and Psycinfo databases, searching for publications that assessed the influence of vision on postural control in individuals with ASD from 0 to 18 years of age in any setting. Primary studies with any study design were included; no study design, language or time limitation restrictions were applied. Two reviewers independently read each search result's title and abstract to identify records that potentially met the inclusion criteria and then read the full text of the eligible studies to confirm their inclusion. Afterwards, two reviewers independently extracted the data from the included studies using previously standardised data extraction tables. When appropriate, data extraction was summarised numerically. We also conducted a descriptive analysis of relevant themes related to the research questions.

Results: The database searches identified 646 studies, and fourteen were included after the selection process (see Figure 1). All studies had a case-control study design and considered 482 participants. We found that the relationship between postural control and vision was assessed using several experimental methodologies, summarised as follows: 1) comparison between postural control test results in closed-eye vs open-eye conditions; 2) assessment of postural control in closed-eye condition; 3) effect of a visual stimulus on postural control. The findings reveal that studies on the relationship between vision and posture in ASD children and adolescents are scarce, and their results are contrasting (see Table 1). The sample characteristics and the methodology used to study the influence of vision on postural control were highly variable. The significant heterogeneity in the methods could explain the contrasting results.

Conclusions: Clear and generalizable conclusions about the relationship between vision and posture in children and adolescents with ASD are not possible. Further research might use rigorous study methods and objective outcome measures tailored explicitly to the considered population.



432.253 Quantitative Assessment of Toe Walking in Autistic Individuals with Intellectual Disability: Comparison between Human Visual Extraction and Automated Markerless Gait Analysis

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Background: Toe-walking (TW) is present in about 20-30% of individuals with autism spectrum disorder (ASD). In some individuals, TW can completely disappear over time without any intervention; in others, it can persist and cause physical problems. TW quantification tools can provide insights into TW trajectories and aid in planning possible interventions. Recently, a video-based coding protocol based on standardized video recordings was proposed to quantify TW in an ecological setting: an operator reviews the videos and computes the parameters. The gold-standard to analyse gait is optoelectronic or wearable motion capture. This is difficult to use in individuals with ASD and cognitive disability because of their non-acceptance. An automated markerless gait analysis system (MGAS) approach could overcome these limitations.

Objectives: This study aims: 1) to implement an MGAS approach to quantify TW and 2) to validate the MGAS approach by comparing it with the reference video-recording approach.

Methods: We conducted a preliminary study on 5 individuals with ASD diagnosed according to DSM-5 criteria. The diagnosis was confirmed through the Childhood Autism Rating Scale (CARS-2), and the intellectual disability was assessed through the Vineland-2. TW was quantified using a modified version of a validated TW structured video-based coding protocol based on standardized video recordings. The test was conducted without shoes, albeit with socks. It consists of transporting 1 object (e.g. puzzle piece, Lego®) from the therapist to the playing table situated 3 meters away and back again 10 times. The assessment was repeated in three days for each individual. Thus, 15 tests were available for analysis. Observing the video, a therapist calculated the percentage of toe steps with respect to the total number of performed steps. OpenPose is the automated MGAS used to analyze the video-recorded tests. A previous study demonstrated its validity. The intraclass correlation coefficient (ICC) was used to assess the reliability between the therapist's visual assessment and MGAS approaches in quantifying percent of toe steps. Also, the Bland-Altman method checks for systematic distortion of measurement values. The 95% Limits of Agreement (LOA) was calculated as 1.96 times the standard deviation (SD) of the difference between the two methods. A narrow LOA range confirms that the methods could be used interchangeably.

Results: The 5 individuals with ASD had a mean age of 9.62 years (SD 2.46) (age range: 7.5-13.2 years; male: 4/5). The mean CARS-2 total score was 37.3 (SD 7.84). The mean Vineland-2 total quotient score was 27.2 (SD 11.35). Two individuals with ASD out of 5 presented TW. The normal data distribution was confirmed (Shapiro-Wilk test $p > 0.05$). The ICC value of the two approaches was 0.975 (excellent). The result of Bland-Altman analysis was shown in Figure 1: an upper LOA below 18.28 and a lower LOA above 29.11 were obtained.

Conclusions: The MGAS OpenPose used for the quantitative assessment of TW in individuals with ASD and intellectual disability showed excellent reliability compared to the reference therapist's visual assessment. Bland-Altman analysis suggests the possibility of clinical application. Further research is required to confirm the results of this preliminary study.



Poster Session

433 - Service Delivery/Systems of Care II

May 2nd, 2025, 6:00 PM - 7:00 PM - Hall 4A

433.255 Implementation of an Autism Screener through Early Intervention: Successes in Implementation but Struggles to Refer and Further Evaluate for Autism

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Background: Though autism spectrum disorder (ASD) symptoms can often be detected by age 2, the average diagnosis occurs around age 4. Developmental screenings play a crucial role in helping identify children at-risk for autism at a young age, yet ASD-specific screenings are underutilized by pediatricians due to barriers like time constraints, training, and resources. Part C of the Individuals with Disabilities Education Act mandates children under the age of 3 with developmental delays receive early intervention (EI) through state programs. EI has been suggested as a complementary or "back-up" system to pediatrician screenings for ASD, with the potential to reduce missed diagnoses in an already developmentally delayed population. Further, EI providers already assess children across multiple developmental domains during intake and have regular interactions with families, making them well-positioned to conduct ASD-screenings. Studies show EI providers are willing to take on this role, though many express the need for additional training.

Objectives: To evaluate ASD screening within EI by looking at the number of children assessed on and failed an ASD screener, referred for additional testing, and diagnosed with ASD each year post-training of EI providers on the ASD screener.

Methods: As part of a contract between Emory University and the Department of Public Health, EI providers across the state were trained in early 2018 through one of two telehealth trainings on how to administer, score, and record the *M-CHAT-R/F* ASD screener. Public health unidentified data was analyzed using SPSS for each year since the training (i.e., starting June 1, 2018, to May 31, 2023). Data analyzed for all children enrolled in EI services included: district, sex, race, date of birth, eligibility date for EI, eligibility domain(s), *M-CHAT-R/F* score at 18- and 24-months, 18- and 24-month screen date, 18- and 24-month personnel that screened, 18- and 24-month screen pass/fail, 18- and 24-month screen outcome, and autism evaluation outcome.

Results: Each year about half the children eligible received an ASD screening in EI (2018, 23.83%; 2019, 49.29%; 2020, 58.49%; 2021, 58.98%; 2022, 58.04%). These screenings were primarily completed by EI providers (86%) and then pediatricians (13%). Out of the total screenings, almost half each year were fails (2018, 37%; 2019, 39%; 2020, 42%; 2021, 46%; 2022, 52%). The majority outcome of a failed score was to Monitor/Rescreen (2018, 61%; 2019, 62%; 2020, 65%; 2021, 66%; 2022, 64%) and then Refer for further evaluation (2018, 15%; 2019, 16%; 2020, 17%; 2021, 19%; 2022, 23%), with only 10% (except 14% in 2022) being evaluated per year. Further data will be requested and analyzed to look at possible significant differences between health districts, demographics, and EI eligibility areas with ASD screenings and evaluations.

Conclusions: EI providers can successfully implement ASD screeners; however, only about half the children eligible were screened. Further, those that fail the screener rarely are referred for or received an autism assessment. Though an improvement, more research is needed to understand why not more young children are not being referred and then evaluated even when identified in EI.

433.256 Implementation of the World Health Organization Program, Caregivers Skills Training (CST), in Brazil: Feasibility, Acceptability and Effectiveness.

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Background: The CST parental training program was implemented in Brazil, pioneering in a southern capital through a partnership between the public health service, NGO, university, and the WHO/Autism Speaks. This caregiver-mediated program has been tested, adapted, and applied across various sociocultural contexts worldwide, aiming to meet the growing demand for interventions for children with ASD and their families.

Objectives: This study aimed to assess the acceptability, feasibility, and effectiveness of the CST program pilot in Brazil.

Methods: Five simultaneous training groups were conducted by facilitators, supervised by Master Trainers (MTs), in a virtual format due to COVID-19 restrictions. A triangulation approach was employed, combining: 1) Quantitative data: non-randomized, open pre- and post-intervention study; 2) Qualitative data: observational, descriptive study. The analysis focused on: 1) The impact on autism symptoms and caregivers' quality of life; 2) Professionals' perceptions of the program's feasibility, acceptability, and effectiveness, and caregivers' perspectives on participation barriers and facilitators. Data collection involved standardized scales (Table 1) and seven post-intervention focus groups (FGs), with content analyzed using Bardin's thematic categorical analysis, supported by IRaMuTeQ® software.

Results: Of the 50 families recruited, 37 began, and 28 completed the program. Among the children, 83.2% were boys, with an average age of 5.22 years and an ASD diagnosis at an average age of 3.34 years. The average adaptive behavior score was 73.7. The ATEC (75.1 to 63.9; $p < 0.01$) and CGI-S (4.42 to 3.89; $p < 0.01$) scores decreased significantly. 75% of TBs improved and CGI-scores increased (0.789 to 1.526; $p < 0.01$). Among caregivers, 91.9% were women (88% mothers), with an average age of 35.2 years. Most (64%) were not formally employed, and 44% reported psychiatric disorders (depression or anxiety). No significant differences were found in the median total scores of the WHOQOL ($p = 1.00$) and PedsQL ($p = 0.66$) between pre- and post-intervention. However, participants without psychiatric illness showed a significant increase in PedsQL scores ($p = 0.02$), and post-intervention differences emerged between those with and without psychiatric illness ($p = 0.02$). The thematic analysis identified 6 categories in the content of the caregivers' FGs, 5 categories in the content of the facilitators' FG, and 6 categories in the content of the MT's FG (Table 2).

Conclusions: Participants appreciated the training content and resources, suggesting minimal adjustments. However, the virtual format and pandemic context presented challenges, such as technological difficulties, caregiver overload (multitasking mothers), and limited bonding among caregivers. Engagement varied according to participants' profiles, influenced by psychosocial and economic vulnerabilities. While synchronous sessions were more effective, some caregivers expressed a preference for direct child-focused care. Facilitator training, which lacked practical interaction with children, was deemed insufficient, making supervision essential. The value of peer exchanges among families and professional support was highlighted. There was also a change in caregivers' understanding of their children's difficulties, better parenting strategies and a reduction in ASD symptoms.



433.257 Implementing a Training Program on Autism Screening for Non-Specialist Healthcare Workers in Sri Lanka: Preliminary Feasibility and Impact

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Background: Research highlights that non-specialist frontline healthcare workers (HCWs) can play a pivotal role in early screening for autism and neurodevelopmental disorders in low-resource settings. In Sri Lanka, Public Health Midwives (PHMs) are ideally positioned for this task as they are the first contact for families of children <5 years old. Training these HCWs on autism and early screening for autism marks the first step in integrating autism screening into the Sri Lankan primary healthcare (PHC) system.

Objectives: The Social Attention and Communication Surveillance (SACS) checklist is a brief play-based autism screening tool developed in Australia (Barbaro & Dissanayake, 2010). This study describes the cultural adaptation of the training program on the SACS checklist for PHMs in Sri Lanka, and evaluates its preliminary feasibility (assessed as suitability and acceptability) and impact.

Methods: Cultural adaptation of the SACS training program followed Barrera and Castro's (2006) framework. In the initial phase, training materials were translated and adapted through consultations with an expert panel and community stakeholders. This study describes the subsequent phase of refining the training to increase suitability to the PHMs' context. The pilot sample for this comprised 108 PHMs from the Colombo District of Sri Lanka, trained from May – October, 2024. Semi-structured focus group discussions were held after the training sessions to inform refinements to the training content. Recordings were transcribed, translated, and analysed using reflexive thematic analysis. Acceptability and confidence in screening were assessed using a five-point Likert scale questionnaire adapted from Gilbert and colleagues (2023). A pretest-posttest autism knowledge questionnaire, adapted from Shrestha and colleagues (2022), was used to evaluate preliminary impact. Quantitative data is analysed using descriptive statistics.

Results: 20 focus groups (n = 108) were conducted in total. Suggestions from PHMs to increase feasibility propelled iterations made to the training curriculum, including: i) retaining original English words for autism-specific terms (e.g., “echolalia”), as the Sinhala equivalent was not widely known, ii) providing a script on how to “convince” parents on the importance of screening, framing it as an “advanced” milestone tracking method where PHMs directly observe the child's development via play (not saying it is for “autism”), iii) using more videos that show screening of Sri Lankan children using the SACS checklist, as Sri Lankan children were typically said to be shy and require more encouragement to engage in play with clinicians, iv) providing a “guide” to help PHMs quickly and efficiently administer screening, recognizing their heavy workload at the PHC setting. Pretest-posttest evaluations over the workshops (n = 108) showed an 18.4% increase in autism knowledge, and a 75.9% increase in confidence in screening for autism. Most PHMs “strongly agreed” that the training was useful (91.6%) and suitable to their context (83.8%), and adequately covered their expected role and responsibilities (83.3%).

Conclusions: These refinements can be considered in similar contexts where an autism screening training program is being integrated into an already busy PHC system. The implementation phase of this study will provide further insights into the program's feasibility and impact.

433.258 Improving Healthcare Provider Confidence and Holistic Care for Autistic Adults through an Echo Autism Intervention

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Background: Autistic adults describe significant difficulties accessing services, specifically high-quality primary care services. While primary care practitioners (PCPs) can provide preventative and coordinated care, they often report lack of confidence and knowledge in working with autistic adults. The Extension for Community Healthcare Outcomes (ECHO) model is a longitudinal clinician education program developed to improve patient care across the care continuum. Utilizing a “hub and spoke” model, community-building strategies, and peer case-based learning make this intervention particularly effective for improving the care of autistic patients and others with medical complexity.

Objectives: The present study utilized the ECHO model (“ECHO Autism Adult Healthcare”) to train PCPs in how to best care for autistic adults. Previous quantitative findings from this program suggest that the ECHO Autism Adult Healthcare training bolstered providers' self-efficacy in working with autistic adults (Malow et al., 2023). The present study utilized a qualitative investigative approach to examine the PCPs' subjective experiences of participating in the ECHO training.

Methods: A qualitative descriptive framework was used to explore the experiences of 22 clinicians with autistic patients who completed the ECHO Autism Adult Healthcare program. Semi-structured interviews, conducted through Zoom, were used to examine the support and education needed to care for patients with medical complexity, the benefits and challenges of the ECHO Autism program, and comparisons to other educational support. Three research team members worked collaboratively to code all transcripts, testing inter-rater reliability utilizing Dedoose analytical software to establish reliability and coding consistency.

Results: Four themes were identified: (1) the benefits of hearing from a wide range of perspectives, (2) establishing and supporting an interactive and engaging climate (3) building a sense of community, and (4) the meaningfulness and usability of resources and information. Overall, participants expressed appreciation for the multidisciplinary hub team members' expertise and experiences. Several participants enjoyed the format of ECHO, as it encourages active discussion and engagement. PCPs indicated that they felt a connection with the hub team members and other participants during the ECHO Autism sessions. They also remarked on the usefulness of the tangible resources and information that was shared during each session and how it could be applied to their own practice.

Conclusions: The current study results highlight the benefits of participating in the ECHO Autism Adult Healthcare program and can guide the development and implementation of future training programs using this model. The ECHO model has the potential to become a best practice for delivering medical education. Broad implementation of the ECHO model for clinicians shows significant benefits for clinicians and patients with medical complexity compared to more traditional forms of CME.

INSAR 2025 Annual Meeting Abstracts

433.259 Increasing Professional's Self-Efficacy to Serve Children with Behavioral Health Conditions and Developmental Disabilities through Dual Diagnosis Echo

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Background:

One in three individuals with developmental disabilities also experiences mental illness, yet clinicians often lack proper training for this demographic, leading to reduced self-efficacy in meeting their needs (Brookman-Frazee et al., 2018; Pinals et al., 2022; Graduate, 2020; Maddox et al., 2020). The Accreditation Council for Graduate Medical Education does not provide the necessary competencies for such cases (Graduate, 2020). To address this, Missouri has initiated the MOADD ECHO program to improve treatment outcomes and enhance community health providers' knowledge of evidence-based practices. The program focuses on virtual sessions with professionals who support children with dual diagnoses and collects data to inform the state government about service gaps and educational needs.

Objectives:

Increase the following learning outcomes for community professionals:

1. Understand best practices for treating/managing dual diagnosis, developmental disabilities, and behavioral health conditions in children.
2. Support children with a dual diagnosis, developmental disabilities, and behavioral health conditions using best practice standards.
3. Explain the Missouri systems available for children with a dual diagnosis, developmental disabilities, and behavioral health conditions.
4. Collaborate/communicate within the Missouri systems that support children with a dual diagnosis, developmental disabilities, and behavioral health conditions.

Methods:

The MOADD ECHO initiative collects data from clinicians via pre- and post-surveys to assess their understanding of best practices and self-efficacy in working with youth with dual developmental and mental health diagnoses.

- Pre-survey: Sent after registration.
- Post-survey: Administered after the program in February.
- Both surveys include demographic questions and self-efficacy assessments focused on autism and mental illness.

Survey questions are informed by the Autism ECHO Communities program, collecting data on educational backgrounds, credentials, age, and experience with autistic youth. This approach evaluates clinician growth and program impact.

The lead facilitator organizes recommendations into categories like care coordination and barriers to care, recorded for clarity.

Results:

Self-Efficacy Data

Results from a subset of participants within the group were based on the change in self-efficacy at the end of the 3rd year series. The average percent change for the whole group of learning outcomes is 24% and the response rate for complete self-efficacy data was 16% (n=19/118). Data for 4th year was collected at mid-series, so it was collected at a different time than cohort 3. The average for cohort 4 is 29% change with the response rate for mid-series 4 being 17% (n=12/72).

Case Recommendations after 3 Cycles

Percentage of Recommendations from 70 cases presented in 3 years.

Category	Percentage of 70 cases
Medication Review	95%
Medical Assessment(Genetic testing and diagnostic evaluations)	87%
FBA and Behavioral Services	64%
Psychotherapy	54%
Family Peer Support Services	46%
Specific Training	41%

Conclusions:

Conclusions show a notable service gap for children with autism and mental health issues in the areas of medication, medical assessment, and applied behavior analysis services. The MOADD ECHO model could aid pediatricians, general practitioners, psychiatrists, and behavior analysts in Missouri by improving their self-efficacy for this population. Surveys from a subset of participants indicated a 24% increase in self-

efficacy at the program's start.



433.260 Individual Barriers to Care: Identifying Support Needs and Strengths According to Autistic Adults and Parents

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Background: Autism spectrum disorder (ASD) is heterogenous in support needs and daily life experiences (Masi et al., 2017). To meet these needs, optimal systems of care must ensure ongoing access to effective services and supports that address a range of priorities and function in partnership with autistic individuals and families (Lord et al., 2022; Pellicano et al., 2022). As such, there is a need to directly ask a cognitively diverse sample of autistic adults and their parents about which factors have been most positively and negatively impactful across the adults' development.

Objectives: This study sought to 1) identify the most common positive and negative factors experienced by autistic adults and parents, 2) test for within-subject changes in endorsement of overall promotive factors from early childhood to adulthood, and 3) test for differences in factors between adults with differing cognitive ability (i.e., less cognitively able [LCA; verbal IQ<70] and more cognitively able [MCA; verbal IQ≥70]).

Methods: The current study included 91 autistic adults (LCA=45, MCA=46; $M_{AdultAge}=29.03$, $SD=1.20$). Respondents were 38 MCA autistic adults, 40 MCA parents, and 44 LCA parents and one legal guardian ($M_{ParentAge}=60.07$, $SD=6.30$) with 32 MCA participants including both a self and parent report. Autistic adults' VIQs ranged from 4 to 139. All LCA autistic adults fell within the profound autism range (VIQ<50). Participants completed a modified version of the Social/Emotional Functioning Interview (SEF-I; Rutter et al., 1988) which consists of open-ended items about helpful and problematic factors experienced across development.

Results: Compared to MCA parents, LCA parents tended to endorse more programming, formal, and structured supports as promotive, and unequipped professionals/caregivers as problematic. MCA parents tended to report employment, education, and informal supports as promotive, and family and interpersonal conflict as problematic. MCA parents reported similarly to MCA autistic adults (i.e., no significant differences) with self-reports emphasizing hobbies/extracurriculars as promotive and a lack of social support/isolation as problematic. There were more significant differences in promotive factors between LCA and MCA parents reported in adulthood than earlier in life ($ps<.05$). Formal and informal people supports were endorsed most often as promotive across developmental stage, reporters, and cognitive groups. Endorsement of generative activities and individual/external factors (e.g., hobbies/extracurriculars, employment, developing autonomy, structure/routine) significantly increased into adulthood for all groups. The proportion of LCA parents who endorsed at least one service as promotive was significantly higher in adulthood compared to adolescence ($ps<.05$).

Conclusions: Findings highlight prevailing service gaps such as the need for more skilled professionals and structural supports, interpersonal interventions, and increased opportunities for community engagement, as well as leverageable strengths like the importance of personal relationships across formal and informal support settings. Critically, results are aligned with the lived experiences of a cognitively diverse sample of autistic individuals. Perceived risk and resilience factors can therefore inform targeted mobilizations of care systems (i.e., acknowledging and addressing varied prioritizations among families of more and less cognitively able autistic individuals which may become more pronounced over time) and direction of autistic self- and stakeholder-defined research frameworks across the lifespan.



433.261 Integrated Primary Care Psychology (IPPC) Perspective: Abbreviated Autism Assessment

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Background: With behavioral health needs of children and teenagers on the rise, the integration of pediatric psychologists into the pediatric primary care (IPPC) setting has become an increasingly popular effort to improve access to mental health services in the United States (Lines, 2022). In many IPPC clinics, psychologists see patients referred by their pediatrician for “warm handoffs.” These same day visits, consisting of clinical interview and brief recommendations, are often a patient’s very first touchpoint with a behavioral healthcare provider. Given that the pediatric primary care setting sees a patient population that is largely infants, toddlers, and young children, the IPPC psychologist is uniquely positioned to provide monitoring for developmental delays and neurodevelopmental disorders over time (Stancin et al., 2018).

Objectives: With waitlist times at specialty care clinic sometimes spanning 18 months, efforts have been made for IPPC psychologists who encounter patients with suspected autism in their initial consults to assess and diagnose these more “straightforward” clinical cases “in house,” by way of an “IPPC Abbreviated Autism Assessment” workflow. This project will discuss assessment batteries used, workflows and implementation efforts, barriers encountered, and ongoing collaboration across systems of care.

Methods: Data collection includes retrospective review of electronic medical records and clinic operations data. In this model, parent and teacher questionnaires are gathered at the initial consultation visit (ABAS-3, BASC -3, ASRS). Patients are then scheduled for a single follow up, during which cognitive screenings are administered (DAYC-2 Cognitive, or KBIT-2R), and a social/ play observation is conducted (CARS-2).

Results: Descriptive statistics will be presented to provide information regarding patient demographics, number of patients seen through IPPC, and percentage who received an autism diagnosis through formal evaluation. Data collection is still underway at the time of this submission and will be presented based on data from 2023 through the end of 2024. Briefly, since its implementation in 2023, this service line (conducted by two psychologists at one location) has had a steady flow of patient referrals (130+), providing a diagnosis to over 100 patients to date.

Conclusions: Utilization of IPPC touchpoints for autism assessment reduces barriers to diagnosis for many families, especially those of otherwise healthy children who present to the pediatrician only for annual visits. Monitoring, assessing, and diagnosing autistic patients within their medical home allows for decreased opportunities to be “lost to follow up,” increased rapport with families, and reduced reliance on specialty care for patients in need of expedient early intervention. Patients in this model leave their assessment visit with a diagnosis and the documentation needed to access services like applied behavioral analysis, without ever being placed on an 18+ month waitlist. While this workflow has been a successful pilot and has connected many patients with needed care, challenges with reliable triaging, clinical resources (e.g., limited availability of IPPC services in hospital settings across the state and limited clinical space in pre-existing pediatric clinics), and psychologist comfort with conducting autism assessment continue.

433.262 Integrating a Novel Web-Based Autism Detection Pathway into the Sri Lankan Health System: Perspectives from Public Health Workers in Colombo

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Background: Improving screening and early identification mechanisms for autism is necessary to ensure positive long-term developmental outcomes. Such sustainable and accessible autism detection pathways embedded within the existing healthcare system could help improve the quality of service delivery to Sri Lankans. The current norm in Sri Lanka is clinician-administered screening for autism, operating under the constraints of low sensitivity and limited capacity. This highlights the need for a more sensitive and universal detection pathway utilizing Sri Lanka’s well established public health sector, with Medical Officers of Health (MOH) and Public Health Midwives (PHM) at the forefront.

Objectives: To identify proposed solutions that can combat barriers to the integration of a novel web-based autism detection pathway into the existing Sri Lankan healthcare system, as perceived by Public Health workers in the Colombo district.

Methods: A qualitative descriptive study, based on a pragmatic epistemological approach, was conducted gathering data through focus group discussions and in-depth interviews with 16 MOHs (4 FGDs/ 6 IDIs) and 30 PHMs (5 FGDs / 6 IDIs) from the Colombo district. Recordings were transcribed, translated, combined with observer notes, and inductive thematic analysis was used to develop key themes emerging from the data.

Results: Time, space and human resource allocations were the key barriers identified. Participants proposed the following solutions: incentivizing PHMs, implementing the screening tool at home visits instead of busy clinics, and training all staff at MOH Offices to distribute the workload more evenly. To combat the barrier of low digital literacy and resources, adequate training was proposed as a solution, given the relatively high level of training and capacity building already allocated in the healthcare system for PHMs. Funding is required to solve the issues related to digital infrastructure. Low levels of autism awareness and community engagement among parents and healthcare workers could be addressed by displaying posters and videos at Maternal and Child Health clinics; and material disseminated via social media. Additionally, establishing processes for appropriate communication of detection results to parents, aimed at minimizing parental distress, and mechanisms for a simple and efficient post-detection process, including referrals for further care, are necessary for promoting community engagement.

Conclusions: The integration process of detection pathway should be designed with a clear understanding of barriers: the constraints of limited resources, low digital literacy and resources, and low levels of community awareness on autism. Incentives, adequate training and capacity building, and practical methods of administration were suggested solutions. A pragmatic approach is necessary when mobilizing the resources of a public healthcare system, to provide solutions for the identified barriers. Sri Lanka’s well-entrenched and strong public health care system, alongside enthusiastic public health workers, can be strong enablers in the effective implementation of the web-based autism detection pathway.

433.263 Interactive and Experiential Learning to Improve Delivery of Diagnostic Care for Families of Children with Autism

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Background: Due to the growing prevalence of autism and a shortage of developmental-behavioral subspecialists, non-specialist providers like primary care providers (PCPs) are increasingly playing a key role in delivering care to children with autism. Families report increased satisfaction with care when an autism diagnosis is appropriately and informatively disclosed (e.g., when their concerns are validated by professionals and when they are given information about autism and the opportunity to voice questions/concerns). However, key professionals responsible for pediatric care (e.g., PCPs) report insufficient training in discussing the diagnosis and providing autism-focused recommendations and follow-up.

Objectives: In an attempt to address these limitations and improve service delivery for children with autism and their families, we developed a novel educational curriculum – comprised of an interactive online training module and a standardized patient encounter – geared toward training pediatric providers to navigate discussions and feedback/disclosure surrounding an autism diagnosis. The goal of this study was to evaluate the acceptability, utility, and impact of our curriculum on provider confidence in key areas of practice (e.g., making a formal autism diagnosis, communicating with and providing diagnostic feedback to families, and counseling families about recommendations and referrals).

Methods: We developed an online open-access interactive learning module to train pediatric providers to discuss an autism diagnosis while navigating cultural contexts, addressing common questions/concerns, and providing motivation and support for families' next steps. Participants completed embedded electronic (REDCap) pre- and post-surveys assessing demographics, past training/experience, confidence in key areas of practice, and participant feedback. After completing the module, a subset of participants completed a simulated encounter requiring them to practice delivering an autism diagnosis. Participant performance was evaluated using a rubric consisting of 10 numerical ratings tied to module content. Participants were provided with individualized feedback on their performance and completed surveys assessing simulation utility and impact (e.g., level of confidence in related practice areas).

Results: A Wilcoxon signed-rank test indicated statistically significant increases in participants' (N = 25) confidence in 4 of 6 practice areas (Table 1), including the three primary focus areas targeted by our curriculum. Preliminary participant feedback has indicated a high level of acceptability and satisfaction. Preliminary data regarding the simulated encounter has been positive, with all participants "agreeing" or "strongly agreeing" that they felt comfortable answering questions regarding autism diagnosis after completing the simulation. In addition, participants have described the simulation as "immersible and realistic," a "great way to practice common questions," and "a helpful framework to delivering any kind of unexpected news to families."

Conclusions: Preliminary feedback indicates participant satisfaction with the curriculum, improvement in provider confidence, and utility in future clinical practice. This suggests that open-access resources and interactive/experiential learning may help to equip providers with needed autism-focused training. We will continue to collect and analyze survey data and participant performance ratings to evaluate the acceptability, utility, and impact of our educational module and simulation on provider confidence and use of key target skills.



433.264 Keeping Students with Special Educational Needs (SEN) in School from Age 16 to 18 Reduces Their Risk of Later Disengagement

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Background: 1 in 4 autistic adults has attempted suicide, and only 29% of autistic adults in the UK were employed in 2021. Disengagement from school, also known as becoming 'NEET' (Not in Employment, Education, or Training), is a key risk factor for unemployment, mental health conditions, and suicide across the lifespan. To reduce the number of students who become NEET, the United Kingdom introduced legislation in 2013 to raise the minimum participation age (RPA) from 16 to 18. However, the efficacy of the RPA for students with special educational needs (SEN) has not yet been investigated. Evaluation of the RPA is important for autistic people, as autism is the most common type of SEN in the UK.

Objectives: Establishing whether RPA Legislation reduced the proportion of students with SEN who became NEET in the two years after leaving mandatory education.

Methods: This study leveraged the lifetime educational records (ages 5-20) of 113,268 children with Education, Health and Care Plans (EHCPs) across England via the National Pupil Database from five consecutive cohorts who began school in 1998-2002. Students with SEN were compared by cohort year, to evaluate the efficacy of the RPA, with Cohort 1 serving as the reference group. Cohorts 1-3 completed education before RPA implementation and were followed up at ages 17 and 18. Cohort 4 completed education during the RPA transition year and was followed up at ages 18 and 19. Cohort 5 completed education in the first year of the RPA and was followed up at ages 19 and 20. Unadjusted and adjusted mixed effects regression models were employed, accounting for gender, ethnicity, socioeconomic status, major language, social services contact, exclusion/expulsion, absences, and local authority.

Results: Students with SEN in Cohort 5 were half as likely to become NEET in the two years following mandatory education compared to students with SEN in Cohort 1. Compared to Cohort 1, students with SEN in Cohorts 2-5 all had relatively lower risk of becoming NEET in the two years following mandatory education. Exclusions, socioeconomic status, absences, social services contact, and random effects from local authority all increased risk of becoming NEET. The RPA appears effective at reducing the number of students who become NEET in the two years following mandatory education, even when following up students to age 20.

Conclusions: Requiring all students to remain in education, employment, or training from ages 16-18 reduces disengagement among students with SEN in the two years following mandatory education, even after accounting for demographic factors. Preparation for implementation of the RPA (e.g., a new reporting structure on student outcomes from schools to local authorities) or other educational policies may explain the reduction in the risk of becoming NEET for Cohorts 2 and 3. These findings support the efficacy of the RPA for students with SEN for two years, though longer follow-up is needed. Policymakers around the globe should consider the utility of increasing the mandatory education age as a key risk reduction tool for reducing long term negative outcomes for autistic students and students with other SEN.



433.265 Leveraging Lived Experience to Support Autistic People and Their Families Post-Diagnosis

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Background:

The benefit of parent-to-parent support is documented in the literature to enhance family quality of life, family functioning, service utilization, thus impacting parents to thrive. (Moody et al. 2018; Bray et al. 2017). This evidence was a primary motivation for creating the ECHO Autism: Advocates (EAA) program. The EAA program delivers professional development to family and self-advocates with the aim to increase the knowledge and skills necessary to navigate complex support systems, actively connect people on the spectrum and their families to best-practice resources, influence policy, and provide emotional support. The EAA program is led by an interdisciplinary team of content experts who provide education and support to participants who have diverse educational backgrounds and life experiences. Virtual sessions are held twice monthly for 90-minutes, where didactic and de-identified case presentations deliver curriculum to participants regarding the areas of: Medical System, Education System, Eligibility-based Services, Mentorship, Employment, Evidence-based practices & Advocacy. EAA's robust training curriculum and ability to offer ongoing guided practice to support participants positions the program to provide the level of professional development necessary to train and support family and self-advocates to mentor other autistic people and their families in a professional or non-professional capacity.

Objectives:

- Examine if EAA is an effective program in preparing participants with the knowledge and confidence necessary to serve patients/families professionally
- Examine if EAA is effective in providing adequate ongoing guided practice to assist participants to feel confident in serving patients/families professionally

Methods:

A small cohort of EAA participants (n=4) was selected to examine if participating in EAA adequately prepared and subsequently supports them to guide patients/families recently diagnosed with autism as a paid "Connector" for the ECHO Autism Community Connections (EACC) program. Four sources of data have been analyzed to examine if participation in EAA provides adequate training and ongoing support to serve as an EACC Connector.

1. Participant demographics
2. Pre-/retro-pre/post-EAA program surveys completed by recruited Connectors
3. Qualitative data collected from a Connector focus group
4. Overall EACC program satisfaction data

Results:

All participants were parents (F=3, M=1) of autistic children and participated in the EAA program for an average of 4.5 years. Self-efficacy data was collected prior to starting the EAA program. On a 6-point scale that ranged from no confidence to highly confident/expert, scores were highest in the family mentorship domain (4.31) and lowest in Eligibility-Based services (1.7). Data collected during a focus group with 4/5 Connectors felt they were adequately educated about resources, learned appropriate vocabulary, understood the boundaries of providing emotional support, and practice meeting patients/families "where they are" because of participation in EAA.

To date, the EACC program has a high-level of satisfaction from both patients/families and diagnosticians.

Data analysis will continue through February 2025.

Conclusions:

EAA provides adequate training and ongoing guided practice for parents of autistic people who professionally mentor others with autism and their families. We hypothesize that full data analysis will show there is an increase in self-efficacy reported by Connectors who participate in EACC and EACC satisfaction data remains high.

433.266 Longitudinal Mental Health Care Use and Relapse of Mental Health Problems in Autistic Adults.

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Background:

Many autistic adults experience co-occurring mental health problems, which negatively affect their wellbeing and lead to increased mental health service use. To optimize care for autistic adults, it is essential to better understand their real-world intervention use and to tailor existing interventions to autism-specific needs. A crucial aspect of mental health interventions is relapse prevention. Relapse refers to the re-occurrence of mental health problems after initial successful intervention. To date, relapse and relapse prevention received limited attention in autism guidelines and research. Therefore, we initiated a multi-method project, addressing real world intervention use, relapse and relapse prevention in autistic adults.

Objectives:

Examining longitudinal patterns of therapy, counseling, and medication use in a large sample of autistic adults, with one such pattern possibly indicating relapse (*e.g., using therapy – no intervention – using therapy*).

Studying the perspectives of autistic adults and their clinicians on relapse and a particular relapse prevention method (i.e. relapse prevention plan).

Methods:

First we conducted a quantitative study into real-world intervention use, using self-report data on intervention use of 445 autistic adults (18-87years) across five-to-seven years. We applied sequence analysis and hierarchical clustering to identify clusters of individuals with similar patterns of intervention use. Sensitivity analyses and cross-method validation were used to verify the obtained clusters.

Currently, we run a qualitative follow-up study, including participants from an outpatient clinic specialized in mental health care for autistic adults. We interview ~15 autistic adults about relapse and relapse prevention, followed by thematic analysis. Additionally, we conduct a Delphi-study including both autistic adults (n=8) and their clinicians (n=8), collecting suggestions to tailor the relapse prevention method to the needs of autistic adults.

Results:

We obtained four clusters with distinct patterns of intervention use (least intervention, mostly counseling, mostly medication, mixed use) that differed on several demographic variables. Most notably, the “*mixed cluster*” contained relatively more females and individuals with co-occurring psychiatric conditions. We did not identify a cluster with a pattern that indicated relapse.

The data collection of the qualitative study is ongoing, and results will be presented at the INSAR conference. Results include: 1) Autistic adults’ perspectives on relapse and factors contributing to relapse. 2) Suggestions of autistic adults and their clinicians to optimize relapse prevention, resulting in a relapse prevention plan tailored to autism-specific needs.

Conclusions:

Many autistic adults made frequent and prolonged use of interventions, although they varied in type and duration of intervention use. This reflects the clinical complexity of tailoring intervention approaches for autistic individuals, particularly for autistic females and those with co-occurring psychiatric conditions. Our findings imply that accessible and multi-disciplinary care is essential to adequately support autistic adults. We speculated that our quantitative approach was limited in detecting relapse, partly because relapse in autism may be difficult to define. Results of the interviews may shed light on this issue, paving the way for future studies into relapse. Finally, we highlight the potential clinical implications of our qualitative studies for improving relapse prevention in autistic adults, including the tailored relapse prevention method.

433.267 Main Therapies Performed on Brazilian Autistic Children and Adolescents, Monthly Investment and Family Income

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Background: In 2023, the first phase of the non-governmental sociodemographic data survey *Mapa Autismo Brasil* - MAB (Autism Map Brazil) was carried out in the Federal District, with the aim of identifying and describing the characteristics of individuals diagnosed with Autism Spectrum Disorder (ASD).

Objectives: This study aims to characterize the results obtained in the MAB from the perspective of the health versus autism interface, specifically: to identify and describe the therapies, by type and frequency (number of hours/week), carried out by autistic children and adolescents aged up to 14 years and to categorize, by range, both the approximate financial investment and the income of the families responding to the MAB Phase 1 with regard to these services.

Methods: The MAB sampling method was non-probabilistic convenience, data collection took place through an online questionnaire, from July to September 2023, in the administrative regions of the Federal District, Brazil, and reached a total of 1,699 valid responses. Approved by the Ethics Committee (CAAE: 70226623.9.00005540). This study included responses provided by caregivers of autistic person aged between 0 and 14 years, to which a descriptive analysis was applied.

Results: Of the 1,699 valid responses, 1,184 (69%) fell into the age range between 0 and 14 years. Of this group, 50% are at level 1, 36% at level 2, 8% at level 3, and 5% did not know how to respond. For autistic person currently undergoing therapy (n=966), the most prevalent therapies were: Psychology, with 788 responses; Speech Therapy, with 712; Occupational Therapy, with 661; Pedagogy, with 430; Music Therapy, with 276; Nutritionist, Physiotherapy, Hippotherapy, Sports/Arts, Psychomotricity and other therapies accounted for 499 all together. About hours of therapy per week, caregivers indicated that 33% of autistic people have between 1 and 5 hours, 19% have more than 10 hours, 18% did not respond, 18% have between 5 and 10 hours, and 9% have less than 1 hour. Regarding the monthly financial investment in therapies and consultations, the data revealed that 28% of caregivers spend between R\$1001 and R\$3000; 22% between R\$501 and R\$1000; 13% between R\$100 and R\$500; 12% between R\$3001 and R\$5000; and 9% invest more than R\$5000 per month; 6% of respondents receive free therapies through the public healthcare and 5% rely on associations, foundations or other non-profit organizations to pay for therapies. Regarding the family income of caregivers, the results indicate: 38% have an income higher than four minimum wages; 17% declared having no income; 16% receive between one and two minimum wages; 13% between two and four minimum wages; 9% have an income lower than one minimum wage; and 5% preferred not to respond.

Conclusions: The main therapies received by children and adolescents with autism, between 0 and 14 years old, according to the data collected, are Psychology, Speech Therapy and Occupational Therapy, with a predominant workload in the range of 1 to 5 hours per week (33%), and monthly financial investment in therapies and consultations in the order of R\$500 to R\$3000 (50%).



433.268 Maltreatment and Foster Care Placement Outcomes Among Children with Autism and Intellectual Disability: A Population-Based Study

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Background: Children with autism spectrum disorder (ASD) and intellectual disability (ID) are disproportionately involved in child welfare systems, yet little is known about the intersection of disability status, maltreatment, and foster care placement outcomes. This study seeks to explore the characteristics, risk factors, and permanency outcomes of children with ASD and/or ID involved in the child welfare system, focusing on their experiences of maltreatment allegations and foster care placement compared to children without disabilities.

Objectives: The study aims to (1) examine differences in maltreatment allegations and substantiation rates, (2) assess child and family characteristics associated with foster care placements, and (3) evaluate permanency outcomes, including the likelihood of reunification, adoption, and remaining in foster care.

Methods: Using the Child and Caregiver Outcomes Using Linked Data (CCOULD), merged administrative data from Florida's child welfare and Medicaid systems (2015-2021), this study includes children with at least one Medicaid claim and one maltreatment report (N=651,044). Disability status was categorized into four groups: ASD-only, ID-only, ASD+ID, and no ASD/ID. Logistic regression models were used to assess the odds of substantiated maltreatment and of out-of-home placement. Among those with substantiated maltreatment, we compared permanency outcomes of children with disabilities relative to children without disabilities.

Results: Children with disabilities faced significantly higher odds of maltreatment reports, with children with ID-only and ASD+ID more likely to experience multiple maltreatment reports. However, children with ASD, especially those with co-occurring ID, had lower odds of substantiated maltreatment compared to children without disabilities. Despite fewer substantiated allegations, children with ASD-only and ASD+ID were more likely to be removed from their homes, especially in adolescence. Children with disabilities also spent longer periods in foster care, particularly in non-relative and congregate care settings. Children with both ASD and ID had the highest rates of prolonged foster care placements, with 53.8% spending five or more years in care compared to 25.5% of children without disabilities. Children with ID-only and ASD+ID were also more likely to remain in foster care or age out of the system rather than achieving permanency through reunification or adoption. Children with ASD-only had higher rates of adoption (28.7%), while those with ID were more likely to age out of care, with ID-only (13.2%) and ASD+ID (14.5%) groups having significantly higher odds of aging out compared to their non-disabled peers.

Conclusions: Children with ASD and ID experience distinct challenges within the child welfare system. Although they are less likely to have substantiated maltreatment allegations, they are more likely to experience prolonged foster care placements, with many aging out of the system. These findings highlight the need for tailored interventions that address the unique circumstances and needs of children with disabilities and improve their chances of achieving permanency.

433.269 Measuring the Support Networks of NON-Speaking Autistic Youth during Their Transition to Adult Medical Care

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Background: Autistic youth approaching adulthood are expected to transition from pediatric to adult healthcare providers and navigate adult-oriented systems. People with autism are particularly vulnerable during these transitions as resources for transition decrease. For transition-age youth on the spectrum who are non-speaking, these challenges may be compounded by functional language impairments and higher prevalence rates of co-occurring conditions. Coordination among healthcare providers and between healthcare providers and family/community supporters could be a key resource for non-speaking autistic youth during transitions, however, no studies have been conducted to measure the structure, composition or social capital exchanges that occur in the social networks around nonspeaking autistic youth.

Objectives: Use mixed-methods approach to characterize the healthcare transition networks of non-speaking autistic youth.

Methods: We used purposeful sampling and recruited caregivers from different cultural backgrounds and SES (n=6) and hospital supporters (n=22) of non-speaking autistic youth (n=4) from an urban hospital. A "name generator" question (Burt, 1984) was used to identify a roster of network supporters at home, in the extended family, in the community, at school, at the hospital and with hospital community partners. The social network survey was administered in face-to-face interviews with participants lasting 30-90 minutes. SNA analysis was done in RStudio (R version 4.2.2). Semi-structured qualitative interviews were conducted in person for 30-90 minutes and were recorded, transcribed and double coded in NVIVO with consensus coding for any unmatched codes. Thematic analysis was conducted to identify themes related to medical transitions for non-speaking autistic youth.

Results: Overall network size varied greatly among youth (Figure 1). Family (35%) and community (30%) made up approx. two thirds of the overall network. School (18%) and hospital providers (11%) and hospital community providers (7%) combined to make up the rest. Non-speaking youth had positive interactions with most of the people in their ecosystem network (mean 79%). Caregivers were able to access support and resources from their support network for their autistic youth. On average, 39% of people provided good ideas, 23% provided healthcare coordination. However, only 5% of network members provide support for the transition to adult healthcare providers, indicating a need for improved collaboration around healthcare services and support for transitions within the support networks. (See Table 1). Two themes were identified: (1) purposeful delayed transition to adult services (subthemes: parents reliant on providers to initiate and manage transition to adult care, preparation delays encouraged by providers, no transition manual or playbook, bureaucratic milestones navigation creates delays); (2) individualized pathways to adult services (subthemes: caregiver as expert about youth needs, hospital provides individualized comprehensive services, individualized multisystem connections required).

Conclusions: By systematically measuring the interactions of the ecosystem supporters of non-speaking autistic youth and how they coordinate to support the healthcare transition, we can provide an interactional baseline from which healthcare supporters and caregivers can work together to identify existing social network supports and gaps in services. This pilot study contributes innovative methods for including the transition support needs of non-speaking autistic youth.



433.270 Mental Health Challenges, Including PTSD, in Medicaid-Enrolled Autistic Adults: Insights from National Claims Data. K. J. McLean¹, J. Ventimiglia², J. Wright², C. B. Klein³, S. Voltaire⁴, G. L. Wallace⁴, T. W. Benevides⁵, L. G. Klinger⁶ and L. Shea², (1)A.J. Drexel Autism Institute, Philadelphia, PA, (2)A.J. Drexel Autism Institute, Drexel University, Philadelphia, PA, (3)TEACCH Autism Program; Psychology & Neuroscience, TEACCH Autism Program, UNC Chapel Hill, Chapel Hill, NC, (4)The George Washington University, Washington D.C, DC, (5)Institute of Public and Preventive Health, Augusta University, Augusta, GA, (6)TEACCH Autism Program; Psychiatry, UNC TEACCH Autism Program, Chapel Hill, NC

Background: Research frequently overlooks the full spectrum of mental health conditions experienced by autistic adults, often failing to adequately investigate and address the unique challenges and complexities associated with mental health issues within this population. This gap in understanding may contribute to underdiagnosis and inadequate treatment options. Understanding the prevalence of mental health conditions and service utilization patterns is essential for developing effective interventions. This study investigates the experiences of adults with autism (ASD), those with autism and intellectual disabilities (ID), individuals with only ID, and those without either condition, using 2019 National Medicaid claims data.

Objectives: The primary aim of this research is to analyze the prevalence of various mental health diagnoses—including anxiety, depression, PTSD, schizophrenia, suicidal ideation, suicidal attempts, bipolar disorder, and personality disorders—among distinct disability groups aged 30-64. Additionally, we seek to explore service utilization patterns for mental health services across these groups, with particular emphasis on PTSD claims to address the calls for increased focus in this area.

Methods: Using a national sample of 2019 Medicaid claims data, we stratified adults aged 30-64 into four groups: those with ASD, those with ASD and ID, individuals with only ID, and a control group with neither diagnosis. We calculated the proportions of individuals with claims for specific mental health conditions and stratified the data by sex and age groups (30-39, 40-49, and 50-64). Service utilization for psychiatric claims was examined to identify care settings, including inpatient, long-term care, emergency department, and outpatient services. Special attention was given to PTSD claims, analyzing both primary and secondary claims, and identifying the primary diagnosis associated with secondary PTSD claims.

Results: Among 18,190 autistic adults, 58.61% of men and 64.55% of women had Medicaid claims for anxiety in 2019. 32.47% of men and 39.9% of women had claims for depression. For the 6,193 adults with ASD+ID, anxiety was reported in 59.5% (men) and 57.54% (women), depression in 20.46% (men) and 28.05% (women). Women in the ASD and ASD+ID groups exhibited higher rates of depression compared to men, particularly within the 30-39 age group. Compared to autistic adults with ID, or adults with ID only, autistic adults without ID had the highest percentage of PTSD Medicaid claims (7.57%). Of those with PTSD claims, autistic adults accessed care primarily through outpatient services. For those with secondary PTSD claims, the primary diagnosis was often depression, schizophrenia, or bipolar disorder.

Conclusions: The findings highlight the need for targeted interventions addressing anxiety, depression, and PTSD among autistic adults, particularly women. Additionally, service utilization data underscores the importance of improving outpatient and community-based care to reduce reliance on emergency services. Future research should investigate the role of trauma in autistic individuals' mental health and develop tailored strategies to improve access and continuity of care in these population.

433.271 A Pilot Feasibility Randomized Controlled Trial of Remote-Delivered Parent Training Compared to Parent Education for Parenting Stress and Challenging Behaviors in Autistic Youth in Pakistan

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Background:

Behavioral challenges in children with autism can significantly impede their adaptive functioning and educational progress, placing substantial emotional strain on parents. In Pakistan, parents encounter considerable obstacles in accessing resources due to insufficient awareness of autism and a limited availability of specialized services. Consequently, telehealth coaching for parents has emerged as an evidence-based intervention that is more accessible for vulnerable families, minimizing the need for intensive and potentially costly professional involvement (Bearss et al., 2018). Given the growing use of technology and the limited healthcare resources in Pakistan, there is an urgent need for affordable, accessible parent-training programs to support children with autism and their families.

Objectives:

This study aimed to assess the feasibility and acceptability of a remotely delivered Parent-Led Training for Disruptive Behavior (PTDB) intervention designed to reduce parental distress and manage disruptive behaviors in children with autism spectrum disorder (ASD). A nested qualitative study design was employed to explore the feasibility and acceptability of the intervention, providing insights to inform a future clinical and cost-effectiveness trial.

Methods:

Twenty mothers of children with autism spectrum disorder (ASD), aged 3 to 12 years ($M = 5.70$, $SD = 2.46$), were randomized into either the PTDB group ($n = 10$) or the Parent Education (PE) group ($n = 10$). The PTDB intervention included 11 core sessions, one telephone booster, and one virtual session over 24 weeks, facilitated by experienced therapists via Zoom, Skype, and MS Teams. Outcome measures, such as the Irritability subscale of the Aberrant Behavior Checklist (ABC), Vineland Adaptive Behavior Scales, Parenting Stress Index, and Clinical Global Impressions-Improvement Scale, were administered at baseline, week 12, and week 24. In-depth qualitative interviews ($n = 8$) were also conducted to explore participants' lived experiences of parenting a child with ASD and their experiences with the PTDB program.

Results:

Preliminary analysis demonstrated acceptability for the remotely delivered PTDB intervention, with reductions observed in the Irritability subscale scores for both the PTDB and Parent Education (PE) groups. Notably, the PTDB intervention showed preliminary efficacy over to the PE group in managing challenging behaviors and enhancing adaptive skills among children with autism spectrum disorder (ASD). However, no significant reduction in the scores of parental stress indexes were found. Qualitative interviews revealed that mothers experienced considerable stress, particularly due to their children's challenging behaviors, which often led to social isolation. Many mothers reported resorting to alternative treatments due to the lack of available resources and formal parent training programs. Despite technological challenges in remote areas of Pakistan, the findings highlight the potential use of the PTDB intervention and its acceptability among parents.

Conclusions:

These findings will guide the design of future adequately powered multi-site clinical trials and cost-effectiveness randomized controlled trials (RCTs) in Pakistan.

433.272 Mixed Method Assessment of Proximal Implementation Outcomes across Service Settings for Caregiver Implemented Reciprocal Imitation Training (CI-RIT)

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Background:

IDEA Part C requires early interventionists (EIs) to use evidence-based interventions (EBIs) with families of birth-to-3-year-olds with developmental delays, including autistic children, in the “natural” environment (i.e., home or daycare). Whether an EBI is perceived as feasible, acceptable, and appropriate may affect its system-wide implementation and ultimately, child outcomes (Proctor et al., 2011).

South Carolina EIs received training in an EBI called Caregiver-Implemented Reciprocal Imitation Training (CI-RIT) that targets social communication. Because CI-RIT is parent-mediated, it is possible that delivery in community-based settings (e.g. daycares) could introduce unexpected barriers.

Despite seeing about one third of their caseload in daycares or out-of-home settings ($M=27.240\%$, $SD=19.591$), providers’ perceptions of CI-RIT’s feasibility, acceptability, and appropriateness (FAA) did not vary by the proportion of their caseloads they served in daycares vs. homes (Wedderburn et al., 2024). It is unclear whether these perceptions remained stable after further use of the intervention with their caseloads.

Objectives:

This study builds on prior quantitative findings and qualitatively examines providers’ perspectives on CI-RIT FAA depending on caseload characteristics and provider experiences after time spent using CI-RIT.

Methods:

We employed a convergent mixed methods analytic approach (QUAL – quant) by combining quantitative pre- and post-survey data ($n=44$) from CI-RIT training with qualitative interviews ($n=5$) collected 4 to 7 months later to explore the relationships between FAA and service settings. A rapid coding analysis process was used to create a data matrix of quotes about FAA and intervention setting. Thematic analysis of overall and subthemes were extracted deductively. Themes were compared with quantitative ratings of FAA to assess how overarching opinions on FAA may have changed, both over time and with increased use of CI-RIT.

Results:

Thematic analyses of interviews revealed that CI-RIT successfully helped both new and experienced EIs teach imitation skills to young children. EIs found CI-RIT easy to learn and adaptable to existing imitation-related goals. However, the EIs had feasibility concerns regarding fidelity, balancing priorities in settings with multiple children, and with children with multiple developmental concerns. CI-RIT uses a coaching model that relies on caregiver involvement, yet EIs found that many caregivers were hesitant or unwilling to participate actively in sessions or practice at home, particularly in daycare settings where caregivers were confused about their role and how to integrate CI-RIT into home routines. EIs continued to perceive CI-RIT as acceptable, feasible, and appropriate, but noticed potential implementation challenges tied to receiving coaching indirectly or in overstimulating real-world environments.

Conclusions:

This study examined EIs’ perspectives on the feasibility, acceptability, and appropriateness of CI-RIT. While initial perceptions of CI-RIT were positive across settings, our findings several months later revealed emerging challenges in non-home environments. Despite this, CI-RIT continued to be perceived as an effective intervention for teaching imitation skills. Future implementation of CI-RIT should provide enhanced support, clarified caregiver roles, options for adapting to diverse environments and involving other children, and an evaluation process for caregiver engagement. Addressing these barriers may further enhance the effectiveness of CI-RIT to benefit all children, regardless of environment or family circumstances.

433.273 Multidisciplinary Perspective: Autism Assessment Clinic for Children Aged 5 and Under

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Background: Multidisciplinary assessment of autism offers several benefits, including increasing access for families, who can receive an autism diagnosis as well as comprehensive medical, speech, and occupational therapy assessments in the same visit. Previous research has supported that there are similar diagnostic rates in interdisciplinary assessment approaches compared to psychology-led evaluations, with benefits including reduced appointment time and increased reimbursement rates (Gerdtz et al., 2018).

Objectives: The current study presents information regarding assessment procedures and outcomes for a multidisciplinary assessment for young children (under age 5) in a hospital setting, with a focus on families from underserved communities.

Methods: Data presented was collected from June 2022 to March 2023. Sample size was 237 patients who were seen through clinic. The multidisciplinary team consisted of a psychologist, medical provider (nurse practitioner or pediatrician), speech language pathologist, and occupational therapist. These providers provide a family-centered evaluation for children with suspected autism spectrum disorder. Psychology assessment procedures including completion of a developmental background from parent rating scales (ASRS, BASC-3, Vineland-3), autism assessment (ADOS-2 or CARS-2), and assessment of developmental functioning (Mullen Visual Reception domain).

Results: Of the 237 patients seen, 183 patients (77.22%) were male and 54 (22.78%) were female. Regarding race and ethnicity, 117 (49.4%) of patients identified as White, 87 (36.7%) identified as Black, 21 (8.9%) identified as Hispanic, 2 (0.9%) identified as Asian American and Pacific Islander, 7 (2.96%) identified as multiracial or not otherwise specified, and 3 (1.3%) chose not to say. Patients with Medicaid as their primary insurance comprised the majority of the sample (163 or 68.79%), followed by private insurance (66 or 27.85%), and 9 patients (3.8%) did not have insurance at the time of their appointment. An interpreter was used for 16 of the 237 families (6.75%). Regarding diagnostic outcomes, 198 patients (83.4%) received an autism diagnosis, while only 39 (16.5%) did not receive a diagnosis. Average age at diagnosis was 40.82 months ($SD=9.36$), with a range of 24 to 59 months of age. Wait times ranged from less than one month to 34 months, with an average of 9 months ($SD=6$).

Conclusions: Results indicate very high rates of diagnosis for patients referred to this clinic, which speaks to the accuracy of pediatrician referrals and the need for increase access to assessment. A significant barrier to access includes the long wait times identified, as well as the large amount of variability in wait time, which indicates operational challenges and barriers. The results also indicates potential barriers to access for children of different racial and ethnicity backgrounds, as the majority of children seen were identified by their parents as being either White or Black, and significantly fewer Hispanic and AAPI patients were seen through clinic. Although the demographics were generally consistent with the population of the greater New Orleans areas, qualitative information gathered through operational discussions indicate that Spanish-speaking families have more challenges navigating the scheduling and measure completion components of the evaluation. Potential solutions and future directions are discussed.

433.274 Multiple Pathways to Excellent Health Status in Autism: A Secondary Analysis of the 2022 National Survey of Children's Health

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Background: Although health disparities in autistic people are well-documented, less is known about how multi-level health determinants combine with one another to contribute to inequitable outcomes. Owing to the limited resources available to address complex health determinants, researchers must identify what factors make a difference, for whom, and under what conditions, particularly for minoritized and marginalized groups like children with autism. Coincidence analysis (CNA) is a cross-case, mathematical approach that can pinpoint the minimally sufficient and necessary conditions for an outcome, and identify multiple pathways to the same outcome, making it a suitable method to examine intersecting determinants of health.

Objectives: Guided by the National Institute on Minority Health and Health Disparities Research Framework, the objective of this study was to identify key bundles of difference-makers that account for “excellent/very good” overall health status among a large sample of autistic children using CNA.

Methods: The 2022 National Survey of Children’s Health contains publicly available data on multi-level determinants of health for 1,726 children whose parents reported a current diagnosis of autism at the time of the survey, perceived overall health status of the child on a five-point Likert scale, and various other health and well-being factors. A literature review informed the selection of 62 potentially relevant factors for modeling the outcome of interest. CNA was applied to develop a model for explaining “excellent/very good” health among the sample.

Results: The initial exploratory analysis identified five of the highest scoring factors: intellectual disability severity, difficulty obtaining specialist care, family resilience level, chronic pain, and history of being overweight (as told by a healthcare provider). The final model explained “excellent/very good” health status via two combinations of factors: 1) no intellectual disability, no experience with chronic pain, and high family resilience, and 2) no need for specialist care and no history of being overweight. This two-pathway solution accounted for 86% of the cases reporting excellent/very good overall health with 80% consistency.

Conclusions: Given the complexity of autism health, research priorities include drawing upon innovative methods to better understand and address health disparities and their intersecting factors. CNA revealed combinations of multilevel health determinants that make a difference in the overall health status of autistic children. This new, nuanced understanding of specific phenotypes can guide future interventions and practices aimed at modifiable individual and family-level determinants of health.

433.275 Navigating Suicide Screening for Youth with IDD: Insights from Dbpnet

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Background: Depression and suicide frequently co-occur in individuals with autism and intellectual and developmental disabilities (IDD), although there are limited evidence-based strategies to respond to positive suicide screens in clinical settings for patients with autism or IDD. As developmental-behavioral pediatrics (DBP), psychology, and psychiatry practices that serve these populations are frequently housed in pediatric hospitals, they are subject to the Joint Commission’s National Patient Safety Goal requiring universal screening for suicide risk in patients 12 years and older. Due to the lack of guidance for screening youth with IDD for suicide risk, there is a pressing need for the development of comprehensive strategies and guidelines tailored to support the needs of this population. Improved understanding of current practices as well as the barriers and facilitators to risk identification is critical.

Objectives: Identify variations in practices, facilitators, and barriers to universal suicide screening of children with IDs in pediatric developmental and behavioral health settings.

Methods: Clinicians from hospitals within the Developmental Behavioral Pediatrics Research Network (DBPNet) were invited to describe their suicide screening practices in their developmental-behavioral pediatrics, psychology, and/or psychiatry clinics. One representative per site was asked to complete surveys (summarized with descriptive statistics) and semi-structured interviews (summarized using thematic analysis) to further explore their site’s processes for suicide screening, actions taken in response to a positive screen, and procedures specific to patients with autism or IDD.

Results: Participants included 34 survey respondents and 21 interviewees (Table 1). Surveys revealed variation in suicide screening practices across sites; 44.1% of respondents reported that their practice conducts universal screening, but the processes in place to screen varied widely. All but 2 sites reported some monitoring efforts to ensure screening occurs, but only 4 sites (11.1%) specifically monitor for compliance for youth with IDD.

Interviews (Table 2) identified some facilitators for screening youth with IDD, such as standardizing procedures, training, and having additional staff and facilities available to respond to positive screens. Barriers to universal screening include factors at the patient, family, provider, and system levels. Insufficient mental health care systems in general, as well as a lack of IDD-specific supports, were identified as significant challenges for managing patients with positive suicide screening results.

Conclusions: Despite Joint Commission requirements and specific expertise in behavioral health, we observed wide variation in how suicide screening is implemented and the processes in place for responding to positive screens. Findings offer opportunities to standardize procedures to increase suicide risk identification and response.



433.276 Navigating the Adult Autism Diagnostic Process in Canada: Complex, Costly, and Inaccessible

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Background: Many autistic individuals face lifelong challenges, often feeling different, but do not receive an autism diagnosis until adulthood. **Objectives:** This study explored the experiences of autistic adults in Canada as they navigated the diagnostic process, aiming to highlight its strengths and weaknesses.

Methods: Seventy-four formally diagnosed ($n = 52$), and self-identifying ($n = 22$) autistic adults (ages 20-78, $M = 38.34$), in Canada, were surveyed using an online questionnaire. The survey examined the factors that led them to pursue a diagnosis, the time it took to get their diagnosis, and the positive and negative aspects of the experience.

Results: The sample contained 44 females, 13 males, and 17 other identified genders (i.e. non-binary, demi-female, autigender, agender, and gender queer). The sample was highly educated with 56 respondents (74.7%) having some form of post-secondary education or higher, 51 (68.0%) employed, with 34 respondents (48.6%) reporting above average income ($\geq \$75,000$ CDN annually). All formal diagnoses occurred in 2011 or more recently. Three prevalent co-occurring conditions were sensory challenges ($n = 68$, 80.9%), anxiety ($n = 58$, 81.7%), and depression ($n = 55$, 82.1%). Among these adults, ongoing social difficulties ($n = 64$; 86.5%), difficulties with friendships or intimate relationships ($n = 60$; 81.08%), and mental health concerns ($n = 56$; 75.7%) most often motivated them to seek a diagnosis. Shockingly, 27 respondents (39.7%) reported needing to see four or more professionals to obtain their autism diagnosis. The median cost for obtaining a diagnosis was \$1,500 CDN, although respondents reported spending anywhere from \$0 - \$25,000 CDN. The median amount of time to obtain a diagnosis was 11 months; however, the range was large, with respondents reporting anywhere from 0 - 460 months (nearly 40 years). Interestingly, 33 respondents (49.3%) received a Level 1 diagnosis (i.e., "requiring support"; 19 female, 5 male, 9 other), while 31 respondents (46.3%) did not receive an autism level with their diagnosis (19 female, 4 male, 8 other). This may suggest that many adults with lower support needs go undiagnosed in childhood. The most helpful resources during the diagnostic process were resources created by other autistic individuals and autistic professionals online (e.g., blogs, videos, websites, therapists; $n = 14$, 21.9%), and some individuals also reported not finding any resources helpful ($n = 14$, 21.9%). Conversely, the least helpful were "uneducated professionals" (e.g., family doctors, psychologists, etc.; $n = 26$, 40.6%), and the lack of age-appropriate resources or lack of resources designed for adults with lower support needs ($n = 16$, 25.0%). A deeply concerning finding was that 41.4% of respondents reported engaging in self-harm, highlighting the urgent need for improved support.

Conclusions: The findings demonstrate that the adult autism diagnostic process in Canada is often prohibitively expensive and complex, with long delays, multiple consultations, and significant barriers related to professional knowledge gaps. These challenges make it inaccessible to many adults, especially those with fewer financial resources or lower educational backgrounds. Urgent improvements are needed to better support autistic adults seeking diagnosis and care in Canada.

433.277 Neurodiversity-Affirming Terminology: Speech-Language Pathology Graduate Students' Patterns of Usage across School Years

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Background: Speech Language Pathologists (SLPs) are obligated to provide services that align with neurodiversity-affirming values when working with autistic clients and their families (American Speech-Language-Hearing Association, 2024; Davies et al., 2024). Despite the critical impact neurodiversity affirming practices have on psychosocial emotional outcomes for autistic individuals, not all SLPs understand the faults in ableist practices and fail to embrace the change away from the medical model of disability. This is especially true regarding the alarming rise in SLPs who are willing, yet have not successfully adopted neurodiversity-affirming terminology and practices (Gaddy et Crow, 2023). In order to ensure that future SLPs have the intrinsic motivation to understand the autistic community and are educated on the importance of neurodiversity affirming practices, it is important to evaluate current trends of SLP graduate students' knowledge and utilization of neurodiversity-affirming terminology. **Objectives:** To gain a better understanding of SLP graduate students' knowledge of neurodiversity-affirming practices through differences in utilization of neurodiversity-affirming terms across school years.

Methods: Self-reported data were collected from 33 SLP graduate students enrolled at San Jose State University. Qualtrics surveys were completed anonymously and voluntarily by leveling year students ($n=14$), first year students ($n=9$), and second year students ($n=10$). Participants completed a set of questions with a 3-point Likert scale (rarely, sometimes, often) to disclose their utilization for each of the 8 pairs of pathologizing and neurodiverse-affirming terminology counterparts. Proportion analyses were employed to observe the different patterns of pathologizing versus neurodiversity-affirming terminology usage across school years.

Results: As expected, we observed a decreasing trend in the usage of pathologizing terms across the school years. Further, an increasing trend of "Rarely used" confirmed that students appear to appropriately not use pathologizing terms across the school years (i.e., 32.14% for leveling year students, 44.44% for first year students, and 54.50% for second year students). However, similar patterns were not observed in the neurodiversity-affirming terms. In fact, students across education year were indicating usage of affirming terms at chance level (e.g., approximately 30% across all 3 answer options). Upon closer evaluation of the 8 terminology pairs, only three specific pairs (i.e., individual with autism vs autistic individual, restricted interest vs area of interest, and non-verbal vs non-speaking) had increasing trends in usage of neurodiversity-affirming term and decreasing trends in usage of pathologizing term as the students gained educational experiences. Nevertheless, the other 5 terminology pairs did not follow the expected trends and were shown to have unpredictable patterns of usage.

Conclusions:

These findings suggest that while students may demonstrate decreased usage of pathologizing terminology, they may not be confident in their knowledge and utilization of neurodiversity-affirming terminology. The mixed patterns of usage observed between pairs may be an indicator of insufficient training on neurodiversity affirming terminology and practices. Further research is needed to better understand the clinical implications in using neurodiversity affirming terminology and practices of SLPs working with the neurodiverse population.

433.278 One-Year-Old Autism Diagnosis Among Medicaid-Enrolled Children from 2017 to 2019

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Background: Autism diagnosis before children turn three is increasingly feasible and can facilitate access to needed services and supports during the critical early childhood period of development. Yet, limited research has investigated how the frequency of very early diagnoses (at ages 12-24 months, hereafter one-year-old diagnosis) versus early diagnosis (at age 2 or 24-47 months, hereafter age 2-3 diagnosis), are occurring in the U.S., particularly among Medicaid-enrolled children. Furthermore, little is known about geographic and racial and ethnic disparities in one-year-old diagnoses among this population.

Objectives: We examined (1) trends in very early autism diagnosis (at age 1) versus early diagnosis (ages 2-3) from 2017 to 2019; and (2) disparities in one-year-old diagnosis by race and ethnicity, adjusted for biological sex, and geography (state and rurality) among Medicaid enrolled children diagnosed between ages 12-47 months.

Methods: This was a retrospective cohort study in which data from 14 states in the Transformed Medicaid Statistical Information System Analytic Files (TAF) were analyzed. To be considered diagnosed with autism, each child needed to have had a diagnostic visit with a primary or specialty care provider, with a diagnosis code for autism between 2017 and 2019. Children in the cohort needed to have been enrolled in Medicaid for 11 of 12 months with no history of an autism diagnosis code before the diagnostic visit. Our main dependent variable was whether children were diagnosed with autism at age 1 (12-23 months) versus at age 2-3 years (24-47 months). Unadjusted and adjusted (by biological sex; further, by rurality and state) Ordinary Least Squares (OLS) regression models were fit to assess disparities in one-year-old diagnosis.

Results: The sample included 11,447 children including 9.3% diagnosed at age 1 and the rest diagnosed at 2 or 3 years old. The number of children diagnosed at age 1 increased from 2017 to 2019. There was statistically significant variability in one-year-old diagnosis by sex, race and ethnicity, and rurality (Table 1). Substantial variation in one-year-old diagnosis by state was also found (North Dakota = 1.1% to Georgia = 12.5%). OLS unadjusted and adjusted model results are shown in Figure 1. After adjusting for biological sex, rurality, and state, Black children were significantly less likely than white children to be diagnosed with autism at one year of age ($p = -1.24$; 95% confidence interval = $-2.18, -0.30$; $p = .009$). A similar association was found for American Indian and Alaska Native children ($p = -3.04$; 95% confidence interval = $-5.37, -0.72$; $p = .01$).

Conclusions: This study's results suggest that very early autism diagnosis (at age 1) is increasing among Medicaid-enrolled children. Nevertheless, disparities among children receiving a very early diagnosis exist – particularly in terms of children who are Black or American Indian and Alaska Native. Continued work is needed to reach children who have been historically underserved by autism services in the United States.



433.279 Optimizing Recruitment and Retention: The Role of Referral Networks in Parent-Child Interaction Therapy for Children with ASD

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Background:

Approximately one in four children with autism spectrum disorder (ASD) also have a disruptive behavior disorder (Kaat & Lecavalier, 2013; Ros-DeMarize, Klein & Carpenter, 2023), which often results in referrals to community mental health clinics (Mandell et al., 2005). However, for a variety of reasons sometimes these families get lost between referral and intake, or intake and graduation, thus not receiving the services they need.

Objectives:

This study examined the recruitment and referral network of a parenting program providing Parent-Child Interaction Therapy (PCIT) to children with ASD in a large urban academic medical center and affiliated community-embedded clinics, to determine whether specific recruitment/referral sources could impact the likelihood of families completing screening paperwork, attending intake and completing treatment.

Methods:

Data from 291 families of children with diagnoses of ASD referred between 2018 and 2022 were analyzed. Referral sources included but were not limited to community agencies, social media, and healthcare providers. Logistic regression analyses determined the likelihood of completing the screening paperwork, attending intake, and completing treatment based on recruitment/referral sources.

Results:

Likelihood of families completing their screening packets was greater for those referred by pediatricians ($OR = 3.387$, 95% $CI[1.591, 7.212]$, $p = .002$). Likelihood was also greater during COVID ($OR = 1.818$, 95% $CI[1.060, 3.119]$, $p = .030$). Likelihood of attendance at intake was greater for those referred by medical specialists (e.g., neurologists; $OR = 10.787$, 95% $CI[2.265, 51.370]$, $p = .003$), pediatricians ($OR = 2.870$, 95% $CI[1.144, 7.203]$, $p = .025$), community disability organizations ($OR = 4.731$, 95% $CI[1.669, 13.412]$, $p = .003$), and word-of-mouth ($OR = 15.559$, 95% $CI[1.893, 127.874]$, $p = .011$). None of the referral sources significantly predicted treatment completion.

Conclusions:

Effective recruitment and retention strategies are crucial for engaging families in mental health services. Findings emphasize the role of community and healthcare providers and word-of-mouth in improving treatment access and enrollment, highlighting the need for referral pipelines between pediatricians and mental health providers, and the importance of these for continuity of care, particularly in children with ASD. Additionally, the lack of significant findings for treatment graduation highlight previous findings that have emphasized treatment-specific factors (rather than referral factors) in determining which families complete treatment.

433.280 Overview of the Rural Access to Intervention and Support Evaluation (RAISE) Trial

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Background: Telemedicine holds the potential to address barriers of access to assessment of children at risk for autism. Recent research on tele-assessment has examined its use in controlled research settings or in response to the COVID-19 shutdown. Given the broad range of family concerns and systems-level factors that may affect tele-assessments in clinical practice, there is a need to understand their impact when deployed in traditionally underserved communities. This project evaluates implementation and potential benefits of autism-focused tele-assessments for families with young children in rural districts of Tennessee to understand the mechanisms that support meaningful, sustained, and equitable real-world use of this model.

Objectives: In the current work, we present trial design and initial referral data capture from launch of this DOD-funded trial. Through a partnership with our state Part C system (TEIS: Tennessee Early Intervention System), this study investigates the clinical, familial, and service-system level impact of the introduction of tele-assessment across entire rural catchment areas. The work aims to identify and address barriers to successful implementation of this novel tele-assessment model in underserved areas with existing healthcare disparities.

Methods: Utilizing a stepped-wedge randomized cluster design, we are evaluating pre-post child, family, provider, and system-level impact of deployment across four rural Part C districts. Following baseline capture, implementation is rolled-out in 6-month intervals offering tele-assessment to families traditionally seen in-person (District A: April 2024, District B: October 2024; District C: April 2025, District D: October 2025). Data from referral and electronic records will assess how implementation: (1) affects the number and characteristics of children referred/identified, family engagement, and efficiency and cost-effectiveness of care; (2) examines potential moderating roles of family (e.g. race and socio-economic status) and systems-level (provider perceptions) factors on engagement and impact; and (3) evaluates the impact of family characteristics on diagnosis and family satisfaction with tele-assessment.

Results: 319 children from District A have been referred (195 baseline, 124 intervention). See Table 1 for demographic information of district referrals. A total of 154 appointments were scheduled during baseline (83 in-person, 24 tele-assessment) and intervention (36 in-person, 11 tele-assessment). Table 2 presents responses from TEIS providers about their perceptions of telemedicine pre-visit and feedback from Vanderbilt clinicians about their experiences with telemedicine post-visit. TEIS Providers ($n = 20$) believed that tele-assessment would improve access to services ($M = 4.42$) but were less confident that families would have the necessary resources ($M = 3.68$). Clinicians frequently noted that families completing tele-assessments had access to toys and equipment necessary for the evaluation ($n = 34$).

Conclusions: This ongoing project will provide a critical test of the model's impact on care of toddlers with ASD in rural settings. By embedding site-specific models of ASD tele-assessment within existing early intervention programs and evaluating performance with targeted groups of families, we will gather information necessary for deployment across systems responsible for identifying and facilitating treatment for young children from these areas. Preliminary data from launch suggest that TEIS providers in underserved areas see benefits to tele-assessment and clinicians are satisfied with caregiver involvement.



433.281 Parental Employment Changes in Families with Autistic Children

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Background: Labor force participation is important among parents of autistic children in the U.S. to maintain employer-sponsored health insurance and to earn money for common out-of-pocket expenses. Autistic children often have many health and mental health medical needs that require time to attend and to coordinate, which can reduce the time a parent may be able to spend on employment. Research of non-autistic populations addresses this issue and shows that care coordination reduces parental employment changes by as much as half. Autistic children often have complex needs and more barriers to accessible care than other children with special health care needs (CSHCN), making it important to understand the role of care coordination in employment for families with autistic children.

Objectives: The objective was to examine changes in employment of parents with autistic children compared to parents with CSHCN. We examined the following questions: (1) What are the differences in changes of employment between parents of autistic children compared to parents of CSHCN? (2) How does receipt of care coordination impact changes to employment?

Methods: This study used the National Survey of Children's Health (2021-2022) to examine employment changes in two ways: 1) reduced hours or stopped working, and 2) avoided changing jobs to keep insurance. We estimated the prevalence of employment changes for parents with autistic children compared to parents of CSHCN and used multivariable logistic regression to examine associations with employment changes (including child characteristics, household characteristics, and care coordination status). Finally, we examined differences by age and insurance type stratified by care coordination status, to examine potential interaction of these variables in parents with autistic children and CSHCN.

Results: Parents of autistic children were more likely to experience changes in their employment relative to CSHCN (Figure 1). Care coordination was strongly associated with employment changes for parents of autistic children and CSHCN. More than half (59%) of parents of autistic children and one-third (36%) of parents of CSHCN ages 3-5 years who did not receive needed care coordination reduced hours or stopped working. For autistic children, this was nearly triple the rate of parents who received needed care coordination (21%). Further, within each type of insurance coverage, families who did not receive needed care coordination had the greatest rates of reducing or stopping work hours: 60% of parents of autistic children with both public and private insurance who did not receive needed care coordination reduced hours or stopped working.

Conclusions: Parents may need to reduce hours or stop working to support their child in receiving the services they need, but receipt of adequate care coordination may ameliorate some of this need. The findings from this study demonstrate the need for further research to examine the provision of care coordination and the reimbursement changes to support care coordination, ultimately improving parental employment outcomes and creating more support for families with autistic children.



433.282 Pathway to Change: A Comprehensive Evaluation of the Extensive Needs Service Pilot Program in Ontario

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Background: Existing services often fail to meet the needs of children/youth with intersecting mental health, physical, and neurodevelopmental complexities. Without adequate care, many complex children/youth require acute care services, which are often not suited to their needs. Three Ontario children's hospitals are piloting a program (the Extensive Needs Service, ENS) to provide wrap-around care for individuals with intersecting complexities and unmet needs, including implementing measurement-based care within a rapid learning health system.

Objectives: To describe baseline characteristics of research participants in the Extensive Needs Service across three Ontario children's hospitals.

Methods: We identified key clinical outcome areas based on the funder goals for the program: family distress level measured via the Brief Family Distress Scale (BFDS); mental health/behaviour symptoms measured via the Behavior Assessment System for Children 3rd Edition (BASC-3); and resource-use measured via the Resource Use Questionnaire (RUQ). Participants are research consented children/youth and families receiving care through the ENS at three Ontario children's hospitals (Holland Bloorview Kids Rehabilitation Hospital (HB), McMaster Children's Hospital (MCH) and Children's Hospital of Eastern Ontario (CHEO)). Baseline patient-and-family reported outcome measures (PROMs) are distributed to families at the start of service and longitudinally to inform clinical care and program evaluation. Only participants who consented to research participation were included from HB and CHEO. MCH data were collected as a chart review with waiver of consent. We calculated descriptive statistics to describe the baseline characteristics of ENS clients.

Results: To date, 112 participants have been recruited (HB n=35; MCH n=56; and CHEO n=21). Participants (59% male; n=66) had a mean age of 11.4 years (SD 3.7; range 4-17); and came from varied racial/ethnic backgrounds and income levels. The three most common diagnoses (available for two out of the three sites (HB and CHEO)) included: autism spectrum disorder (n=36), anxiety (n=16), and attention-deficit/hyperactivity disorder (ADHD) (n=15). At baseline, median family distress level was reported at 5/10 ("things are very stressful, but we are getting by with a lot of effort")¹. Fifty-two percent of participants had visited the emergency department over the past two years for behaviour/mental health issues. Across participants, the mean BASC-3 T-scores were 75 (clinically significant), 65 (at-risk), and 77 (clinically significant) for the Externalizing subscale, Internalizing subscale, and Behavioral Symptoms Index, respectively.

Conclusions: Children/youth with a wide range of ages, backgrounds, diagnoses, and social situations are entering ENS with substantial family distress, unmet behavioral needs, and resulting acute care usage. Services for similarly complex children should be determined based on needs and not solely on diagnosis.

References

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433.283 Perinatal and Postpartum Health Disparities Among Black Autistic Birthing People in the US Medicaid System

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Background: Amid a national Black maternal health crisis, the use of data from the largest public health insurer (Medicaid, which funds almost half of births in the US), presents an opportunity to generate findings that are relevant for policy and programmatic reform. Medicaid is also the largest funder of behavioral health care and insures high rates of autistic people. Little is known about perinatal health outcomes among Black autistic birthing people. Previous research centered on the experiences of Black birthing people indicates that minoritized identities, including race, ethnicity, and disability status, may contribute to additive risk for adverse perinatal outcomes.

Objectives: Identify perinatal outcomes among a national longitudinal sample of Black autistic birthing people enrolled in public health insurance and compare them to outcomes among Black birthing people with intellectual disability (ID) and without either autism or ID diagnoses

Methods: National Medicaid claims from January 1, 2008, to December 31, 2019 included Black autistic birthing people, Black birthing people with ID, and a random sample of Black birthing people without autism or ID. Comparison cohorts for each group for white individuals and individuals with other or multiple race/ethnicity were also constructed. Black birthing people and comparison cohorts included individuals with a documented birth during the study period. Perinatal outcomes utilized in previous research among individuals with I/DD were compared using univariate and multivariate logistic regression models. The probability of postpartum anxiety and depression was estimated using Kaplan-Meier and Cox proportional hazards regression models.

Results: More than 3,350 Black autistic birthing people were identified and were younger (mean age 23, SD = 5.9) than their peers with ID (25.5, SD = 6.8) and no autism or ID (26.4, SD = 6.3). Across all groups, most Black birthing people lived in urban areas (79%). Compared to their Black peers with ID or no autism or ID, a higher proportion of Black autistic birthing people had a known miscarriage, stillbirth, or termination (18.8%, vs. 18.5% and 17.7%) and postpartum anxiety (7.1%, vs. 6.5% and 1.9%). In adjusted analyses, Black autistic birthing people had elevated odds for known miscarriage, stillbirth, or termination (1.3; 95%CI 1.13–1.43) and preeclampsia (1.4; 95%CI 1.1–1.7) when compared to their white autistic peers.

Conclusions: In the US Medicaid system, identified Black autistic birthing people are younger than and experience adverse perinatal outcomes at higher rates compared to their peers. Findings underscore the urgent need for awareness about reproductive healthcare broadly and in adolescence and young adulthood. Individualized strategies for effective prenatal, childbirth, and postpartum care to ensure equitable access to maternal healthcare for Black autistic people are needed and should be generated from community-driven processes. Focusing policy and programmatic change in the Medicaid system could support improvements for thousands of Black autistic birthing people.

433.284 Predictors of Depressive Symptoms in Direct Support Workers and Professionals Working in Residential Settings

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Background: In Quebec, autistic adults or adults with an intellectual disability (ID) can live in different types of residential settings depending on their support needs (MSSS, 2014). Direct support workers (DSW) and direct support professionals (DSP) may be exposed to occupational risks that can affect their physical and psychological health, such as the presence of depression symptoms (Bottini et al., 2020). Several factors can lead to depressive symptoms including multiple job demands, work stress and inadequate organizational resources (Gray-Stanley et al., 2010). However, social support is a protective factor for workers' mental health (Ryan et al., 2021). The working conditions of DSWs and DSPs working with autistic adults or adults with ID in Quebec is an issue that has been little explored, although advocates have highlighted several problems in the residential system, including staff turnover.

Objectives: To explore the predictive factors of depressive symptoms in DSW and DSP in the Quebec housing system for autistic adults or adults with ID.

Methods: Quantitative analyses were performed on data collected from 56 participants during the first week of the longitudinal project "Taking Care of Those Who Take Care." A multiple linear regression model was run using a depression severity score obtained from the Patient Health Questionnaire (9 items; Kroenke et al., 2001) as the dependent variable. Independent variables were organizational factors measured by the COPSOQ-III questionnaire (Berthelsen et al., 2020), and the total score of the Social Support Scale (10 items; SPS; Caron, 2013). Variables were introduced simultaneously to build the regression model.

Results: Participants were 43 women and 13 men, with an average age of 37 years old. Most worked between 33 and 40 hours per week, 15.8% had a PHQ-9 score in the moderate range and 5.3% in the moderately severe and severe ranges. The variables included in our regression model were the perception of social support score (SPS), the average number of hours worked per week, and the perception of the negative impact on their personal life caused by the amount of energy their job demands (COPSOQ). This resulted in a statistically significant model, $F(3.52) = 14.311, p < .001, R^2 = .452$. Individual predictors were further examined and indicated that social support ($t = 3.381, p = .001$), number of hours worked ($t = -3.378, p = .001$) and perceived negative impact of work on personal life ($t = 4.309, p < .001$) were significant predictors of depressive symptoms.

Conclusions: Our analysis shows the more negative their perceptions of the impact of work on their personal lives and the less social support they perceive they have, the more severe their symptoms of depression appear to be. These conclusions are like other studies on DSWs and DSPs working in other contexts (Ryan et al., 2021). Surprisingly, in our model, those who worked fewer hours per week had lower depression scores.

Further analyses will explore this relationship. Finding long-term solutions to support DSW and DSP is essential for them to support autistic adults and adults with intellectual disabilities.

433.285 Predictors of Intent to Use Caregiver-Implemented Reciprocal Imitation Teaching within the Part C Early Intervention System

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Background: Caregiver-Implemented Reciprocal Imitation Teaching (CI-RIT) is an evidence-based naturalistic developmental behavioral intervention (NDBI) for social communication (Ingersoll, 2012). CI-RIT and other NDBIs have been implemented within IDEA Part C publicly funded early intervention (EI) systems (e.g., CI-RIT: Wainer et al., under review; ESDM: Rogers et al., 2022; Rooks-Ellis et al., 2024; Project ImPACT: Pellecchia et al., 2023; Pickard et al., 2024). However, while Pellecchia and colleagues (2024) conducted a mixed methods study of predictors of EI providers' use of individual caregiver coaching strategies, there are few studies on factors that might predict EI providers' use of the NDBI as a whole in their ongoing practice.

Not only do attitudes about an evidence-based practice (EBP) contribute to intent to use it (e.g., Theory of Planned Behavior, Armitage et al., 2001), they may also interact with organizational characteristics, client characteristics, and other implementation determinants (Becker-Haimes et al., 2021).

Objectives: We employed a causal model of EBP use (Becker-Haimes et al., 2021) to understand how providers' training background, attitudes (i.e., social validity) and self-efficacy in CI-RIT predicted EI providers' initial intent to use CI-RIT after an initial, in-person training.

Methods: EI providers ($n=123$) in South Carolina were trained in CI-RIT across four trainings offered throughout the state in partnership with Part C. 108 providers (88%) elected to participate in research and completed surveys on their demographic and caseload characteristics, caregiver coaching practices (pre-training), and attitudes about (i.e., social validity of), self-efficacy, and intent to use CI-RIT on a 7-point Likert scale from "Strongly Disagree" to "Strongly Agree" (post-training). Given Becker-Haimes' model (Figure 1), we would expect providers' CI-RIT social validity and self-efficacy, but not provider characteristics, to predict intent to use CI-RIT.

Results: Providers had varied amounts of experience ($M=8.472$ years, $SD=7.718$), and with autism ($M=10.476$, $SD=8.216$). They somewhat agreed that CI-RIT was socially valid ($M=5.099$; $SD=0.322$) and agreed that they felt confident/efficacious in using CI-RIT ($M=5.944$, $SD=0.869$). When entered together into a multiple regression predicting EI providers' ratings of intent to use CI-RIT, neither years of experience with autism nor the percentage of their caseload with social communication concerns predicted their intent to use CI-RIT (Table 1). However, the degree to which they rated CI-RIT as socially valid and their self-efficacy to do CI-RIT both uniquely and significantly predicted their intent to use CI-RIT. CI-RIT social validity and self-efficacy were not significantly correlated, $r=.122, p=.209$.

Conclusions: Our results supported our hypothesis; in line with the causal model of EBP use, providers' CI-RIT social validity and self-efficacy ratings both uniquely predicted increased intent to use CI-RIT in their practice, but provider characteristics that were not in the original theory did not significantly predict intent to use. Of note, EI providers' ratings of CI-RIT social validity were unrelated to how confident they felt about using CI-RIT. These findings, combined with future work understanding how organizational and client characteristics predict CI-RIT use, may help us target implementation strategies to support CI-RIT in early intervention to improve social communication in young autistic children.

**433.286 A Community-Based, Qualitative Approach to Queer and Transgender Autistic Healthcare Experiences**

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Background: Recent research suggests that autistic people are more likely to identify as transgender or queer compared to non-autistic people. These populations face significant challenges accessing healthcare, especially for individuals with multiple marginalized identities. Queer and transgender patients and autistic patients are at higher risk for worse health outcomes and lower access to healthcare. Emerging research suggests that queer and transgender patients face greater difficulty accessing affirming providers and adequate care, which contributes to prolonged and increased health issues over time.

Objectives: This study used qualitative interviews to 1. understand barriers to healthcare access for queer and transgender autistic adults, 2. contextualize these barriers as they relate to accessibility and quality of therapeutic services and gender-affirming care, and 3. explore how these barriers contribute to how these individuals feel about their health.

Methods: This study is part of a larger community-based study with 65 queer and transgender autistic adults. We used a community-based approach when recruiting and interviewing participants. We reached out to 19 community organizations in the Philadelphia area. Sixty-eight percent of the sample identified as nonbinary, 23% identified as cisgender, 6% identified as binary transgender, and 3% of participants were unsure or did not disclose their gender identity. Semi-structured, open-ended interviews were used conducted. The interview guide spanned a range of questions and topics, including queer and gender identity, autistic identity, childhood, family life, education, health, and social relationships. The first author read through a few of the interviews and conducted thematic and line-by-line coding on material that was relevant to answering the research question. A preliminary coding scheme was developed with primary and sub-categories. The research team embodied a diversity of demographic characteristics and queer and autistic identities.

Results: We found that queer and transgender autistic adults felt positively about the integration of these identities, and they felt affirmed when healthcare practitioners approached these identities with respect and sensitivity. Healthcare was described as inaccessible and very stressful for many. Negative experiences with practitioners, such as misgendering, inadequate and insensitive communication around gender-affirming care, and dismissive responses to disclosure of self-identified autistic identity, constituted additional challenges specific to this population. Limited insurance coverage was cited as a barrier to seeking out culturally competent providers. Interviewees reported a variety of chronic and complex issues that negatively impacted their health and well-being, particularly when they struggled to access appropriate services to address them.

Conclusions: Queer and transgender autistic patients benefit from accessing healthcare in contexts where their identities are validated and understood. We argue that health care systems must address the significant barriers to care described and work to be more sensitive and responsive to the needs of this population. Research and advocacy on this topic are needed to promote healthcare reform that will better support the health of neurodivergent and queer and transgender individuals.

433.287 Provider Perspectives on EarliPoint Adoption and Implementation

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Background:

Challenges of long waitlists in accessing an autism evaluation continue to persist in the system. EarliPoint has the potential to greatly improve the efficiency of autism evaluations, thereby alleviating waitlists and creating earlier access to care.^{1,2} Clinicians across medical and psychology fields are currently using, considering, or are unfamiliar with the device. The technology represents a significant shift in clinical practices. As a result, we anticipate that some clinicians will welcome the change; while others may be more resistant to modify their practices. This study uses a mixed methods design to understand clinician perspectives across factors that are theorized to influence the spread of new technology according to the *Diffusion of Innovations Framework*.^{3,4}

Objectives:

- To understand clinician perspectives on factors theorized to influence the spread of EarliPoint into standard autism diagnostic evaluation care
- To identify implementation barriers, facilitators, and strategies to support the implementation of EarliPoint that is most beneficial to families, clinicians, and systems

Methods:

We used snowball sampling to recruit clinicians from across the U.S. (Table 1) and from disciplines who either already provide autism diagnostic services or who are well-positioned to do so with additional training. Participants engaged in a 90-minute virtual session that consisted of: i) a demographic and professional background survey, ii) an overview of the EarliPoint device and evidence behind it, iii) the Perceived Characteristics of Intervention Scale (PCIS),⁵ and iv) a semi-structured qualitative interview. The interview guide was structured in alignment with subdomains of the PCIS and additional domains from prior applications of the *Diffusion of Innovations Framework* to health service organizations. Audio recordings were transcribed and de-identified by the study team. An initial a priori coding structure was developed in alignment with the interview guide, and modified during group coding to reflect nuances that arose from the data and inter-coder agreement. We used NVIVO 14 software for coding, and its framework matrix feature for analysis.

Results:

Preliminary data from 16 providers suggest that pediatricians generally expressed openness and excitement about EarliPoint, with a primary implementation barrier of requiring additional training and resources to expand their scope of practice. Psychologists described a primary barrier of misalignment of processes and output of EarliPoint with their current practices. Many psychologists expressed concerns that clinicians could become over-reliant on EarliPoint and a preference to use it as an add-on to current assessment batteries as opposed to a replacement that would promote efficiency. The PCIS survey findings (Table 2) display a trend of more positive perceptions of EarliPoint among pediatricians ($M=4$, $SD=0.99$) than psychologists ($M=3.09$, $SD=0.91$), with nuances across the PCIS subdomains and qualitative findings.

Conclusions:

Clinician perspectives are vital when studying the implementation of innovations that can bring significant implications to changes in workflow and clinical care. While pediatricians reported on average a higher level of compatibility for adopting the technology into their practice, psychologists were less motivated. These findings highlight the need for tailored training and resources to address the specific concerns of different provider groups to optimize impact at the population level.



433.288 Re-Imagining the Autism Diagnostic System for Young Children through the Echo Autism: STAT Early Diagnostic Program

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Background:

In recent decades we have seen a global rise in the prevalence of autism spectrum disorders (ASD), with an insufficient number of professionals trained to meet this demand and increased wait times for families. The ECHO Autism: STAT Early Diagnostic Model (EDx) was developed in 2017 as part of the ECHO Autism: Primary Care model (Mazurek et al., 2017) to increase access to early identification and diagnosis of young children between the ages of 14-and 48-months with unambiguous characteristics of autism. This program professionally develops community primary care physicians and practitioners (PCPs) to screen, identify, evaluate, differentiate and diagnosis and provide longitudinal primary care for children on the autism spectrum. The current study analyzed the data from the case presentation forms completed by participating clinicians.

Objectives:

Increase local capacity of clinicians in underserved areas who can provide high-quality, best-practice autism evaluations for a subset of young children presenting with clear autism characteristics to decrease wait times and increase access to diagnostic assessments by equipped community clinicians.

Methods:

ECHO Autism: EDx includes explicit training and guided practices on the core elements of autism diagnostic best practices: structured behavioral observation, comprehensive history, and synthesis through clinical expertise. First, community PCPs receive training on the Screening Tool for Autism in Young Toddlers (STAT) and achieve reliability on this measure. Then PCPs participate in twice-monthly, 90-minute ECHO Autism: EDx virtual guided learning sessions, where a de-identified case is presented by one of the community PCPs, followed by an interactive, interdisciplinary discussion to help guide the learning and develop next steps for the case example. The presenting PCP fills out a deidentified case presentation form through a secure data capture, REDCap, with information regarding age, gender, developmental history, family history, evaluation measures/results, behavioral observations, and final diagnostic determination using DSM-5 diagnostic criteria. Data were analyzed from case presentation forms between 2017 and September 2024.

Results:

595 cases were presented (72% male) with a median age of 2.67 years (median age range 1.17 (male) and 1.25 (female) to 6.83 (male) and 6.41 (female). 85% of the cases travelled 30 or less miles to the PCPs office. 70% of cases waited three months or less to see their STAT PCP, with a median value of 1.5 months.

Conclusions:

The ECHO Autism: STAT EDx program has improved primary care providers' (PCPs) self-efficacy in diagnosing and managing autism, leading to reliable and accurate diagnoses in young children with unambiguous autism characteristics (Mazurek et al., 2020; Sohl et al., 2023). This study demonstrates that children are now receiving timely, high-quality diagnostic evaluations, with average wait times reduced to 1-3 months, compared to the state median of 7.6 months (Missouri DMH data, 2023). By training and supporting PCPs, we are creating a system that adapts to the complexities of each child's presentation, enabling PCPs to diagnose and monitor young children at high risk for autism, while also freeing up specialty centers to focus on cases with more subtle or complex presentations.

433.289 Reflexive Thematic Analysis of Pediatric Residents' Perspectives of Best Practices in Autism Care

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Background: Autism is a complex, heterogeneous condition that requires personalized interdisciplinary care. Previous studies have shown that pediatricians feel they are expected to be proficient with the skills necessary to diagnose and care for autistic children, but often feel that their education surrounding autism care has been lacking. Currently, there is no literature on the perspectives of pediatric residents to providing best practice care for autistic children, and there has been no evaluation of autism in the medical education system in both medical school and in pediatric residency.

Objectives: The overarching objective of this study was to explore the experiences of pediatric residents in providing care for autistic children in Canada and identify any gaps in training to inform strategies to enhance autism education and better prepare the next generation of pediatricians for real-world practice.

Design/Methods: Twelve pediatric residents from medical schools across Alberta and British Columbia, Canada were interviewed. An interpretive description methodology was used to conduct semi-structured interviews, and a reflexive thematic analysis approach was used to analyze interview data. Interviews were transcribed, coded, and analyzed iteratively to generate insights about the current state of autism care education.

Results: Seven key themes emerged from the analysis, divided into two categories. Category 1 themes focused on the factors of best practice care for autistic patients, which include the flexibility and optimization of care of the child, family understanding and kindness towards the family throughout the diagnostic process and long-term care, and multidisciplinary care. Category 2 themes focused on barriers to providing best practice care in education, which include residents' perception that training regarding autism care is inadequate, a sense of role confusion when working with autistic children, applicability of what is learned in residency compared to what is seen in real-world practice, and wanting to play a role in long-term care for autistic children, despite it not being taught well in training.

Conclusions: This study highlights critical gaps in providing best practice care for autistic children, and underscores the need for better training in areas such as diagnosis, long-term care, education, and collaboration. The findings support recommendations for expanding autism education within pediatric residency programs, emphasizing practical, hands-on learning opportunities with a clearer definition of residents' roles in autism care. Addressing the gaps in providing best practice care can ultimately improve the capacity of pediatricians to provide comprehensive, patient-centered care, ultimately enhancing the health and quality of life of autistic individuals.

433.290 School Administration Decision-Making and Perspectives on Autism-Specific Classrooms

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Background: Although IDEA mandates the inclusion of students with disabilities in the least restrictive environment, the placement of students with autism in self-contained classrooms remains controversial. This study addresses a critical gap by examining how administrators navigate this complex decision-making process, and perceive the efficacy of their program.

Objectives: This study investigates the placement decision-making process and perceptions of program efficacy amongst administrators in one district as a case study, with potential implications for other districts exploring centralized autism-specific classrooms. A teacher-trainer, principal, and district special education director were interviewed within this school district where all elementary-level self-contained classrooms for students with ASD were established in one school.

Methods: The Southwest (pseudonym) Elementary School District was targeted for this study, as their district educated the majority of their students with ASD who were significantly impacted by autism within one school in multiple self-contained autism-specific classrooms. The school adopted the TEACCH (Treatment and Education of Autistic and related Communication- handicapped Children) model to support their students, and the teacher-trainer, principal of the school, and school district special education director were all interviewed using a semi-structured interview protocol to examine their decision-making process, and perceptions of the efficacy of their program model. Interviews were analyzed using thematic coding, allowing for key themes related to decision-making and program efficacy. To ensure reliability, data were triangulated across interviews.

Results: The decision to maintain all autism-specific classrooms within one school in the district was made prior to the employment of the three administrators interviewed. However, they maintained this model because they felt the benefits outweighed the challenges for the students in this program. There was strong agreement amongst the administrators that the self-contained model was beneficial for their students for several reasons: 1) students were amongst peers that accepted their diversity of behaviors and learning styles, 2) they were able to provide efficient, cost-effective, centralized training and support to teachers who were all working with students with autism within the one school, 3) they believed teachers felt more supported because they had peers to turn to who could help support each other's' students, 4) students had consistency in the teaching model and procedures over time, reducing anxiety and increasing emotion regulation, and 5) parents appeared to support and gravitate to the program (only 88/303 students were from the local district area). Key challenges included limited peer interaction, space constraints, transportation, and recruitment difficulties.

Conclusions: Administrators were overwhelmingly positive about the self-contained autism classrooms within the one school in their district. Even though there were limitations identified, they were concerned that if students were moved to different campuses, they would lose the sense of community identity around autism that had been developed within their school, as well as the consistency in curriculum programming. The findings suggest that centralized autism-specific classrooms may offer logistical benefits but come with trade-offs, particularly around student inclusion, and grade-level academic expectations. These insights could inform policy discussions on balancing specialized support with inclusive opportunities.

433.291 School-Based Writing Support for Autistic Youth: IEP Goals, Professional Involvement, and Caregiver Perceptions

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Background: While research indicates that writing is often a particularly challenging skill for many autistic students, less is known about how professionals support the development of specific writing skills both in general and as part of special education goals. Gaining deeper insights into the writing needs of autistic youth and how professionals support learning in these areas could inform the design of more effective instructional approaches to foster both writing and related literacy skills.

Objectives: This study examines school-based writing practices that support autistic students. Specifically, it investigates the inclusion of writing-related goals in Individualized Education Programs (IEPs), the professionals involved in supporting students' writing skills, and caregivers' perceptions of school-based writing support services.

Methods: Participating caregivers were recruited through SPARK and had an autistic child with a professional autism diagnosis. They completed an online survey about their child's access to educational resources during 2019-2020, prior to the COVID-19 pandemic. The caregivers (n=785) were predominantly mothers, most with a college (63%) or advanced (28%) degree, living in the U.S. Children were mostly White (68%), male (78%), and in elementary school during 2019-2020 (64%). About half of the children qualified for free or reduced-price lunch (45%), and 18% had a co-occurring intellectual disability. Most children attended public or charter schools (87%), with others in private schools (8%) or home-schooled (5%). Children's Vineland-3 Written subdomain scores varied (M=11.47, SD=4.30).

Results: Most children (80%) had an IEP, with 62% having a writing-related goal. The goals focused on handwriting (64%), keyboarding (25%), spelling (41%), grammar (41%), punctuation (41%), sentence composition (53%), and paragraph composition (47%). Various professionals—general educators (GE), special educators (SE), reading specialists (RS), speech-language pathologists (SLP), occupational therapists (OT), and paraeducators (PE)—supported autistic students' writing development. Daily support was most frequently provided by SE (36%), followed by PE (22%) and GE (13%). The lowest levels of daily support came from RS (4%), SLP (4%), and OT (3%). Frequent support was most often provided by SE (25%), followed by PE (14%), GE (13%), SLP (10%), and RS (7%). Infrequent support was primarily delivered by OT (33%) and SLP (29%), with lower levels from SE (13%), GE (12%), RS (10%), and PE (9%). Most caregivers of children with writing-related IEP goals agreed (80%) that their child was making formal progress, while 20% disagreed. Among all caregivers, 76% agreed that their child was making general progress in writing, with 24% disagreeing. A similar proportion (78%) felt their child's writing needs were being met, while 22% disagreed.

Conclusions: Our findings provide new insights into the frequency of school-based writing supports for autistic students. While many students had writing-related IEP goals, these goals varied widely across different skills. Importantly, a range of educational professionals were involved in supporting these goals, underscoring the need for multidisciplinary collaboration to enhance the literacy skills of autistic youth. Although most caregivers agreed that their children were making progress in writing, further research is needed to explore why some felt that their child was not receiving adequate school-based writing support.

433.292 Service Navigation Use Among Urban, Suburban & Rural Black Families with Autistic Children

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Background: Black families with autistic toddlers experience significant disparities in accessing early diagnosis and intervention services, including delays in the age of diagnosis and limited access to intervention services (Bilaver, et.al., 2021, Constantino, et. al., 2020, Wiggins, et. al., 2020). Rural families experience significant barriers to accessing services, including a lack of available providers with the training and experience necessary to deliver high quality services (Mello et al., 2016). To address barriers to care, service navigators have been incorporated into the care system to help families with autistic children identify services needed to support their child (Feinberg et al., 2021). While there is clearly a need, there is limited information regarding service navigation use and preferences across rural and urban Black families.

Objectives: The purpose of this study is to understand service navigation usage and preferences of rural and urban Black families with autistic children. Specifically, this study aims to 1) identify the primary reasons Black families of autistic children reach out to a service navigator 2) determine if those reasons differ based on urbanicity and 3) determine whether race and/or lived experience as a parent are preferred in a service navigator by Black families.

Methods: Families requested service navigation through a web-based resource designed specifically for Black families in North Carolina through a Qualtrics survey. Information obtained through the survey was de-identified, demographics data and service requests were extracted, and a qualitative analysis was performed to identify themes of requests for Black families across NC.

Results: A total of 43 service navigation requests were received between February-October 2024. One request was excluded from the sample as it was from a community service provider. Of the remaining 42 requests, ages ranged from 2 to 49 years, with an average of 8.76 years (SD= 9.09). When the two outliers (over 40 years) were removed, the average was 7.09 (SD=4.50). The majority of requests were from urban areas (47.61%), followed by suburban areas (30.95%) and the fewest from rural areas (16.66%). Two requests were from outside of NC. In terms of preferred qualities of a service navigator, 54.77% preferred to connect with a parent of a child with autism while 71.43% preferred to connect with a Black service navigator.

Several themes emerged from the requests, including service navigation requests for 1) diagnostic evaluations, 2) general services and information, 3) financial support, 4) specific therapeutic and recreational support, and 5) educational support. Themes were more comparable amongst suburban and urban groups, as rural participants did not request financial or school-related service navigation.

Conclusions: Black families of autistic children requested support navigating and connecting with a variety of services. Findings provide initial support for the need for service navigation to aid Black families as they navigate complex systems to support their children. Additionally, variations determined during the thematic analysis indicate that the requests of Black families with autistic children in rural counties in North Carolina may vary in comparison to suburban and urban counties. Implications will be discussed.

433.294 Sustainment of an Autism and Developmental Screening and Referral Intervention in US Primary Care Practices Serving Latinos: A Real-START Follow-up Study

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Background: Provider training interventions positively impact Autism Spectrum Disorder (ASD) and developmental screening rates. While these interventions increase screening and billing rates, it is important to determine whether these interventions are sustainable in the long term.

Objectives: To determine the long-term sustainability of an autism and developmental screening intervention.

Methods: This project was a follow-up of the REAL-START study conducted from 2016-2018, in which 6 Oregon primary care clinics serving >50% Medicaid and >25% Latino patients were trained on developmental and autism screening. The training consisted of one initial and three follow-up sessions on site at each clinic. In the original study, we used Electronic Health Record data to measure autism screening rates (using the Modified Checklist for Autism in Toddlers-R (M-CHAT-R) and general developmental screening rates (using the Ages and Stages Questionnaire - 3 [ASQ]), billing for screenings performed, and Early Intervention (EI) referral after a positive screen. Outcomes were measured at baseline (Period 0) and in 4 post-intervention periods (Periods 1-4) spaced 3, 6, 9, and 12 months after the initial intervention. To measure sustainment, we conducted a follow-up chart review 4 years after the initial intervention (Period 5; using 2020-2021 data). We conducted a mixed logistic regression with a random intercept for the provider for each outcome, exponentiated coefficients to compute odds ratios (likelihood, or odds, relative to baseline), and calculated predicted probabilities with bootstrap 95% confidence intervals for all time periods so we can compare Period 5 to each of the 4 prior study periods. Each model was adjusted for site, visit type, family preferred language, and ethnicity.

Results: The predicted probability of completing the M-CHAT-R increased in the follow-period, showing values of 0.69, 0.80, 0.89, 0.94, and 0.93 for baseline and the initial 4 periods, versus 0.96 in Period 5 (95% CI: 0.94, 0.98). A similar trend was observed for completing the ASQ with predicted probabilities rising during the follow-up chart reviews: 0.63, 0.79, 0.90, 0.95, and 0.94, versus 0.95 in Period 5 (95% CI: 0.91, 0.98). When analyzing both screenings together, the predicted probabilities show an upward trend across the chart periods: 0.46, 0.65, 0.82, 0.90, 0.88, and 0.93 (Figure 1). In contrast, the predicted probability of billing at least once during the first four chart periods (0.85, 0.90, 0.93, 0.95, and 0.96) decreased to 0.93 in the follow-up Period 5 (95% CI: 0.90, 0.96). EI referrals after positive screens did not show significant changes throughout the original study periods or the follow-up periods.

Conclusions: To our knowledge this is the first study of long-term sustainment of ASD screening training in primary care. Primary care providers in community clinics continued to screen at higher rates 3 years after the intervention had ended, but did not sustain billing practices. EI referral rates were not altered in either the initial intervention or in the follow-up.



433.295 Teacher Perceptions and Support for Autistic Students in General Education

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Background: An increasing number of autistic students are educated in inclusive settings, yet many general educators have limited knowledge about autism and feel unprepared to effectively support these students (de Boer et al., 2011). Teachers in low-income and under-resourced settings face additional barriers, including limited time for collaboration and a lack of school-wide support towards inclusion (Iadarola et al., 2015).

Objectives: This research examines general education teachers' perceptions of a) the social challenges of autistic students, b) the social supports general education teachers provide to support autistic students in general education settings, and b) teacher perceptions of the experiences of female autistic students.

Methods:

The study included 173 general education teachers across different grade levels (preschool=3, TK/K= 20, 1st-5th grade= 67, 6th-8th grade= 38, 9th-12th grade= 45). Approximately 80% (n=139) of the teachers were female and the teachers' average age was 47.65 years (SD=24.23 years). Teachers were from 28 different school districts in the Southwestern region of the United States, and 76% worked in Title I schools. Teachers completed The Autism Awareness Survey (Heidgerken et al., 2005; Tipton & Blacher, 2013), and three open-ended question prompts: 1) Identify challenges for their students with autism specifically related to social functioning in the classroom and during free time, 2) List the strategies you use to support students with autism in the general education setting, and 3) Are you currently, or have you in the past taught a female student with autism? Please describe the girl's behavior and social relationships.

Results:

The total correct score for the 14 items ranges from 28 to 56, with a mean of 41.28 (SD=6.81). The highest correct responses were: 1) There is one intervention that works for all children with autism (94.71%), 2) Children with autism can grow up to live independently (97.67%), and 3) There is a cure for autism (88.24%). The highest incorrect responses were: 1) Changing a child's diet will lessen the severity of autism symptoms (32.35%), 2) Autism is a developmental disorder (30.18%), and 3) Autism is an emotional disorder (30.23%).

Teachers identified 15 different social challenges experienced by autistic students. The top three reported social challenges were: 1) Joining/initiating social interactions, 2) Reading social cues, and 3) Reciprocity. Teachers reported 37 different strategies to support autistic students in their classes. The top three strategies were: 1) extra time, 2) visuals, and 3) sensory accommodations.

Only 43% of teachers had taught a female autistic student. When teachers described the experiences of autistic girls compared to autistic boys, girls were described as being more isolated/socially disconnected (40%), socially motivated (33%), and having more difficulty reading social cues (31%).

Conclusions:

The findings corroborate previous research that identified similar patterns of correct and incorrect knowledge of autism among university faculty (Tipton & Blacher, 2013). Qualitative findings highlight general educators' professional development needs to increase their knowledge of autism, including autism in females, and their implementation of evidence-based interventions in inclusive settings.

433.296 Telemedicine in Pediatric Dermatology for Children with Autism: Addressing Nutritional Deficiency, Allergy, and Skin Infections in Resource-Limited Settings of Nepal

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Background:

In Nepal, the incidence of autism is increasing, and many children on the autism spectrum experience significant nutritional deficiencies, resulting in higher susceptibility to skin infections, allergies, and impaired growth. The situation is further complicated by the limited number of pediatric dermatologists, particularly in remote and difficult-to-reach areas like the Himalayan region. This study aims to compare the prevalence of skin infections, allergic conditions, and growth outcomes between children with autism and their neurotypical peers, highlighting the impact of telemedicine in these areas.

Objectives:

To evaluate the relationship between autism, nutrition, allergy prevalence, and skin infections among children in Nepal, and assess the effectiveness of telemedicine in early diagnosis and management of these conditions.

Methods:

A cross-sectional study was conducted between June 2022 and March 2023, involving 60 children aged 3 to 12 years, 30 of whom were diagnosed with autism spectrum disorder (ASD) and 30 neurotypical children. Nutritional assessments included weight-for-age, height-for-age, and BMI measurements. The prevalence of skin infections and allergies was documented through clinical evaluations and telemedicine consultations. Statistical analysis was performed using chi-square tests and logistic regression to identify significant associations between autism, nutrition, allergy, and skin infection rates.

Results:

Among children with autism, 57% had moderate-to-severe malnutrition, compared to 34% of neurotypical children ($p<0.01$). Children with autism showed a significant delay in growth, with a mean height-for-age z-score of -2.7, compared to -1.8 in neurotypical children ($p<0.05$). The prevalence of skin infections in children with autism was 42%, significantly higher than the 24% observed in neurotypical children ($p<0.05$). Allergic conditions such as eczema and allergic rhinitis were more prevalent in the autism group (37%), compared to neurotypical children (22%), with $p<0.05$. Telemedicine consultations allowed early diagnosis and timely intervention, leading to a 28% reduction in the recurrence of skin infections in children with autism over the study period. Parents of children with autism reported high satisfaction (82%) with telemedicine services, particularly regarding timely access to nutritional counseling and allergy management.

Conclusions:

This study highlights the higher burden of malnutrition, allergies, and skin infections in children with autism compared to neurotypical children in Nepal. The integration of dermatology-focused telemedicine has facilitated early diagnosis and improved health outcomes for children with autism, reducing the incidence of skin infections and improving growth trajectories. Statistical analysis showed significant associations between autism, malnutrition, and the prevalence of skin infections and allergies ($p<0.05$), reinforcing the need for targeted interventions in these areas.

Telemedicine is a vital tool for managing pediatric dermatology and allergy cases among children with autism in resource-limited regions like Nepal. Children with autism are at a significantly higher risk of malnutrition, skin infections, and allergies, making early intervention critical. Expanding telemedicine services in remote areas is essential for improving health outcomes, particularly for vulnerable populations such as children with autism. Telemedicine offers a scalable solution to the challenges of delivering dermatological care in underserved regions, particularly for children with autism who face additional health risks. Policymakers and healthcare providers should prioritize telemedicine infrastructure to bridge the gap in care and improve long-term health outcomes.

433.297 The Autism Occupational Therapy Coaching Program: Building Capacity through the Use of a Neurodiversity-Affirming Lens

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Background:

Occupational therapists (OTs) play a vital role in supporting the pediatric autism community. Providing service and care delivery that aligns with evolving best practices is essential. Until recently, promoting neurotypical behaviours and norms have been the dominant healthcare approach utilized by OTs. However, emerging evidence from the neurodevelopmental field has prompted a shift towards providing care that reflects a neurodiversity-affirming (NDA) approach. Occupational therapy regulatory bodies are updating standards and expected competencies, necessitating changes to care practices. To change approaches to care however, OTs need knowledge and skills on how to implement an NDA approach. Yet, current professional development opportunities related to autism are inadequate, leaving many OTs lacking confidence in supporting autistic clients.

Objectives:

To address this knowledge and practice gap, the Autism Occupational Therapy Coaching (AOTC) Program was developed. This poster presentation will describe the development of the AOTC Program, and implementation and evaluation efforts.

Methods:

Kern's Six-Step Approach for Curriculum Development for Medical Education and Bloom's Taxonomy were used to create the AOTC professional development program. Autism research and best practices, and a needs assessment informed program development. A synchronous, virtual-based format combined with a multi-modal approach to education was used. An evaluation strategy consisting of pre and post-program surveys was conducted to assess program satisfaction and opportunities for optimization, and self-reported shifts in knowledge, attitudes, and intended behaviour change. The Most Significant Change technique was also used as an evaluative method post-program delivery to monitor perceived changes the AOTC program brought to participants.

Results:

The AOTC Program was delivered to 117 OTs over eight months to seasoned practitioners (5 years or more of clinical experience), recent graduates (less than 5 years of clinical experience) and students. Positive shifts were reported in problem-solving, application of an NDA approach, and use of reflective techniques in clinical decision making. Participants identified that the program format and structure fostered a psychologically safe environment, allowing OTs to learn, exchange knowledge, and build connections with their peers. They valued the case-based, small group format and the collaborative atmosphere. Participants reported increased confidence in applying an NDA approach and developed skills that changed their mindset, such as approaching client behaviors with a sense of curiosity and reflecting on assumptions made about the needs of clients and families. In terms of program optimization, suggestions for improvement included providing a platform for continuous engagement and resource sharing.

Conclusions:

This professional development program provided OTs with the knowledge, skills, and training needed to implement an NDA approach when supporting the pediatric autism community. The real-time, virtual format of the AOTC program proved to be a successful approach for delivering autism-specific capacity building opportunities. Future opportunities for program enhancement include fostering ongoing learning and engagement among the AOTC OT participants through networking and information sharing.

433.298 The Availability and Accessibility of Medicaid-Funded Peer Support Services for Autistic Adults in the United States

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Background: Autistic adults in the U.S. face a higher risk of mental health conditions, yet there are few mental health services specifically tailored to their needs. Peer support, which provides shared knowledge, emotional support, and guidance from those with lived experience, has been shown to be effective in promoting recovery, reducing depression, improving emotional well-being, and increasing needed engagement with physical and mental health services. Many peer support programs are funded through Medicaid, providing a crucial and affordable source of support for eligible individuals. To ensure these services meet the unique needs of autistic adults, it is important to evaluate their availability, scope, and how effectively they address access barriers and service gaps.

Objectives: The purpose of this project is to assess the current availability and accessibility of Medicaid-funded peer support services for autistic adults in the United States.

Methods: States that were contacted based on the order in which Medicaid-funded peer support services were established in that state according to KFF. A brief, ten-question survey was administered to state behavioral health leaders involved with peer support services that queried about specific funding mechanisms associated with Medicaid-funded peer support services, scope of services, billing codes, changes to funding structure over time, target populations, and plans for peer support services in the future. Surveys were completed either over Zoom or electronically via Qualtrics. Data collection remains in process.

Results: Leaders from twelve states completed the survey. Ten states reported that peer support services fall under the provision of services offered through their Medicaid state plans. In the two states where peer support services were not part of the Medicaid state plan, services were covered by Medicaid waivers. Peer support services funding was not reported to have changed over time in the majority of states. For states that provided billing code information, codes differed by state but remained consistent over time. Most states did not consider autistic adults or adults with developmental/intellectual disabilities as a target population for Medicaid-funded peer support services receipt. Two states explicitly mentioned discussions of expanding service eligibility to autistic adults and adults with intellectual and developmental disabilities. Data analyses are ongoing.

Conclusions: Understanding the current landscape of peer support services in the United States is crucial to developing effective strategies to ensure that autistic people, a population with high occurrence of mental health conditions, gain access to and fully benefit from such services. Thousands of autistic adults in the U.S. qualify for Medicaid-funded peer support services due to comorbid mental health diagnoses, but many cannot access these services. However, peer support services have the potential to benefit more individuals on the spectrum if scope of services and billing procedures model those of states that have successfully implemented Medicaid-funded peer support services for autistic people.

433.299 The Effects of a “Sensory Toolkit” Education on Comfort Level and Self-Efficacy Among Medical Teams Working with Pediatric Autistic Patients in Outpatient Settings

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Background: Autistic persons experience disparities in healthcare access and delivery (Nicolaidis et al., 2013) and encounter unmet healthcare needs four times greater than their neurotypical peers (Karpur et al., 2019). Autistic youth are more likely to have frequent medical visits and experience challenges during healthcare interactions (Bultas et al., 2016; Vohra et al., 2014). These difficulties are often related to sensory aspects of care (Hand et al., 2021), such as touch, sounds, and difficulties processing sensations from the body and environment (Syu et al., 2020). Medical providers report low levels of comfort working with autistic patients (Fingert et al., 2014) and only a minority of medical providers report high confidence in communicating, completing physical exams, and identifying accommodations for autistic youth (Nicolaidis et al., 2020).

Objectives: The study team examined the effects of a “sensory toolkit” intervention on outpatient medical staff’s comfort and self-efficacy in working with autistic youth. Data were also collected on the acceptability, appropriateness, and feasibility of integrating the sensory toolkit into the medical practice.

Methods: A multidisciplinary healthcare team of Psychologists, Physicians, Board Certified Behavior Analysts, and Certified Child Life Specialists developed a sensory toolkit: a portable kit filled with various sensory items (e.g., noise canceling headphones, chewy tubes, fidgets, etc.), and corresponding education on accommodations and environmental and behavioral adaptations in healthcare settings to support the sensory needs of autistic youth. Seven outpatient clinics completed anonymous surveys immediately pre- (n=63) and post- (n=31) education. Surveys included questions on demographics, Likert scale ratings of comfort level working with autistic patients (Broder-Fingert et al., 2014) and self-efficacy in treating autistic patients (Nicolaidis et al, 2021), levels of challenge/reward in providing care to autistic youth, and (post only) the acceptability, appropriateness, and feasibility of the sensory toolkit (Weiner et al., 2017).

Results: Comparative analyses examined changes in comfort and self-efficacy pre- v. post-education. Significant increases were found in the following: comfort using non-vocal communication (e.g., pictures to communicate, assisted and augmentative communication, etc.), comfort inquiring about communication needs, overall comfort in conducting visits, self-efficacy in identifying accommodations to facilitate care, self-efficacy in completing necessary exams/procedures, self-efficacy in helping patients stay calm/comfortable, self-efficacy in making necessary accommodations, and overall self-efficacy in working with autistic patients (Table 1). The sensory toolkit was found to be acceptable, appropriate, and feasible, with most respondents expressing agreement or strong agreement to these questions (Table 2). Exploratory analyses found that having previous autism-specific training led to significantly higher comfort levels pre-education (p=0.033). Demographic variables including age, sex, and tenure did not correlate with any significant differences in comfort or self-efficacy.

Conclusions: The sensory toolkit was found to be a valid and accepted intervention in outpatient clinics. Results indicated significant changes in medical staff’s comfort and self-efficacy in working with autistic youth. The lower return rate for post-surveys suggests that continued evaluation will be needed. Nevertheless, these findings support the preliminary efficacy of training for outpatient medical staff on the implementation of autism-specific, sensory-based interventions to promote inclusive healthcare experiences for autistic patients.



433.300 The Influence of Session Modality on Parent Participation Engagement and Family-Centered Care in Part C Early Intervention

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Background: Telehealth use has rapidly increased in community service settings, including the Part C Early Intervention (EI) system, particularly in response to the COVID-19 pandemic. Telehealth intervention may mitigate barriers to service access and previous studies suggest it promotes parent knowledge, fidelity, and satisfaction. However, little is known about how telehealth impacts other important parent experiences, including engagement and family-centered care (FCC), in community service settings. While research suggests parent engagement in child psychotherapy promotes child outcomes, few studies examine parent participation engagement (PPE)—active and independent contribution to child treatment—in community-based autism intervention. Furthermore, though the Part C EI system emphasizes the provision of FCC (i.e., practices that value and incorporate family perspectives and priorities), little research explores whether service modality impacts parent experiences of FCC. As telehealth EI continues to be offered post-pandemic, it is vital to understand how service modality impacts these core tenets of Part C and valuable parent experiences more broadly.

Objectives: Examine whether intervention session modality—telehealth versus in-person—impacts PPE and parent-reported FCC in Part C.

Methods: Parents ($n=147$) and EI providers ($n=83$) were recruited from an ongoing RCT examining the effectiveness of a parent-mediated social communication intervention. Parents participated in weekly EI sessions with their provider for four months. Session modality was chosen by each parent-provider dyad. Up to three session recordings were collected for each dyad ($n_{\text{total}}=333$, $n_{\text{telehealth}}=51$, $n_{\text{in-person}}=282$) and were behaviorally coded for PPE using a standardized observational coding scheme. A subset of parents ($n_{\text{total}}=49$, $n_{\text{telehealth}}=4$, $n_{\text{in-person}}=45$) completed the Family Centered Practices Scale regarding the extent to which their provider utilized practices consistent with FCC. For FCC analyses, session modality was determined by the modality used in at least 75% of sessions.

Results: Given the repeated/nested nature of the PPE data, a 3-level multilevel model examined the influence of session modality on PPE, controlling for intervention condition. Since previous research suggests single parents exhibit reduced PPE, the model also controlled for marital status. Preliminary results indicate higher PPE in telehealth versus in-person sessions ($t(185)=-2.65$, $b=-.36$, $p=.009$). Since FCC was measured only once, a multiple linear regression examined the impact of session modality on parents' FCC perceptions. The regression controlled for intervention condition and minoritized status, as prior studies suggest minoritized families experience reduced FCC. Service modality did not significantly predict parent-reported FCC ($t(48)=-1.39$, $b=-2.92$, $p=.17$).

Conclusions: Preliminary findings suggest parents exhibit higher active engagement during telehealth EI sessions compared to in-person. This is likely because telehealth restricts direct work with the child, potentially promoting parent engagement by necessity. FCC results suggest similar parent experiences of FCC across service modalities but are currently underpowered. Data collection is ongoing to increase sample size, particularly for FCC analyses. Though current findings may be confounded by pandemic enrollment time, they support growing literature that telehealth may preserve and even promote valuable parent outcomes, including engagement and FCC. Thus, telehealth may remain a reasonable alternative to in-person sessions in Part C. Further analyses will examine potential parent-level moderators to inform individualization of service delivery.

433.301 The Lived Experience of Students with Autism in Higher Education: Challenges, Supports, and Strategies for Success
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Background:

The number of students with an autism spectrum disorder (ASD) entering higher education has increased significantly in recent years (Tan et al. 2024). However, these students often face unique challenges in navigating academic, social, and institutional aspects of college life. Understanding their lived experiences is crucial for developing effective support systems and promoting inclusive educational environments.

Objectives:

This study aimed to:

- Explore the lived experiences of students with ASD in higher education settings.
- Identify key challenges and barriers faced by these students.
- Investigate effective support strategies and coping mechanisms employed by students with ASD.
- Develop recommendations for institutions to enhance the educational experience and outcomes for students with ASD.

Methods:

A qualitative phenomenological approach was adopted, involving in-depth, semi-structured interviews with 30 Autistic students (aged 18-40) from a major University in Australia. This methodology aligns with recent studies emphasising the importance of first-hand accounts in understanding the autistic experience in higher education (Green & Shaughnessy, 2023). Participants were recruited through disability support services offices. Interviews focused on their academic experiences, social interactions, institutional support, and personal strategies for success. Thematic analysis, following the guidelines outlined by Braun and Clarke (2023), was used to identify recurring patterns and themes in the data.

Results:

Four major themes emerged from the analysis

Academic Challenges: Participants reported difficulties with executive functioning, sensory sensitivities in classroom environments, and anxiety related to group work and presentations

Social Navigation: Many students experienced challenges in forming friendships, interpreting social cues, and participating in extracurricular activities

Institutional Support: While most participants acknowledged the availability of support services, many found them insufficient or not tailored to their specific needs as students with ASD

Personal Strategies: Students developed various coping mechanisms, including time management techniques, self-advocacy skills, and seeking out quiet spaces on campus.

Conclusions:

This study provides valuable insights into the lived experiences of students with ASD in higher education, building upon recent research in this field. Findings highlight the need for more comprehensive and individualised support services, increased awareness among faculty and peers, and the importance of fostering inclusive campus environments. Future research should focus on long-term outcomes and the effectiveness of targeted interventions for supporting students with ASD in higher education settings.



433.303 A Community Based Housing Model to Support Independent Living for Young Adults with Autism

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Background:

Adults with autism face many challenges in living independently, including high housing costs and finding support services.. (Scheeren et al., 2021). People in many cities struggle with high housing costs. Seattle area apartment rents are among the highest in the nation and continue to increase (Balk, 2024, Apartments.com). New approaches to affordable housing and support service delivery are needed for the ever-increasing number of young autistic adults as they seek stable independent living opportunities.

Objectives:

This research describes an innovative community program which combines affordable in-city apartment living with supportive services for autistic young adults and the outcomes of the initial cohort of participants.

Methods:

A total of 32 self-identifying autistic young adults without intellectual disability enrolled and moved into their apartments between August 2021 and August 2024. Age ranged from 19 to 49 with an average age of 24.6 and the majority of participants were male (81.3%). Data was collected from enrollment assessments and ongoing progress reports.

Results:

The program was based in a newly constructed apartment building open to the general public. The building's rents are considered affordable for those with only 50% of the Adjusted Median Income (AMI) so that no more than 30% of income would be spent on housing including rent, basic utilities and fees. Service costs were in addition to housing and included 1:1 coaching, small group instruction around basic living skills such as cooking, and social groups and community building. On average, young adults spent 15.6 months (range from 2-35 months) in the program. Ten were still enrolled in the program at the time of this research, nine had returned to home or live with family, and 13 moved on to independent living with minimal or no support. Participants who had higher community engagement (work, school or volunteering) and lower support needs during their time in the program were more likely to live independently after leaving the program.

Conclusions:

The results of this initial analysis demonstrate that programs geared toward helping autistic young adults with independent living could be adopted in many high housing cost cities. Challenges that remain include addressing stable and fulfilling employment and social opportunities. Funding for the increasing costs of housing and services, particularly sourcing public funds, may enable expansion of the program to many more individuals. Next steps for additional research may include a deeper exploration of the variables impacting outcome after leaving the program, particularly around employment.

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433.304 Transformation of Preschool Autism Services in Nova Scotia – the First 2 Years

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Background: Over the past 10-15 years, Nova Scotia has witnessed a continually growing demand for diagnostic assessments and interventions, and a consistent upward trend in the number of children receiving an autism diagnosis. Families have reported challenges in navigating the system and available interventions have not met the needs of all families. In April 2022, the province announced new and enhanced preschool autism services to be developed in NS to include a greater number and range of interventions and supports, that are well coordinated and tailored to the needs of children and their families. Ongoing evaluations of these changes are important, to understand and refine processes and ensure effective and equitable service delivery across the whole province.

Objectives:

1. Compare data collected for the calendar years 2018 to 2022 to the calendar years of 2023 and 2024 concerning number of referrals for diagnostic assessments, number of professionals qualified to perform assessments, number of diagnostic assessments undertaken, and their distribution across the province.
2. Document the new educational resources and interventions available, or soon to be available, developed through work with families that respect the diversity of strengths and needs of autistic individuals, their families and communities.

Methods: Data have been collected for more than 20 years on autism diagnosis rates in different areas of the province and the uptake of a naturalistic developmental behavioural intervention (NDBI), the main autism specific intervention offered to preschool children prior to the transformation of services. The data from 2018 to 2022 will be compared to data collected during 2023 and 2024. The creation of a centralized diagnostic waitlist, a centralized clinical intake and care coordination team, with service delivery throughout the province along with a new outcomes-based measurement digital platform will facilitate robust data collection and tracking of clinical outcomes at a child/family level, clinician level, and system/ program level going forward.

Results: Preliminary results indicate that on average 35 children/month were referred for a diagnostic assessment in 2018 and 65/month in 2023, with 25 assessments/month completed in 2018 and 38 assessments/ month in 2023. In 2018, 13 children/month commenced NDBI intervention with 21/month in 2022. In 2024, additional interventions became available. In addition, 8 information handouts and 19 videos have been uploaded to a dedicated webpage since the Fall of 2023 as part of an accessible Autism Education Series for families and practitioners. Full results will be available to be presented.

Conclusions: Nova Scotia is undertaking a rapid and ambitious transformation of services for preschool children suspected of having, or with an autism diagnosis, and their families. Interrogating data on referral rates, numbers of diagnostic assessments, numbers and variety of interventions, and new information resources, indicate that in the context of increasing demand, a greater variety and volume of assessments and provision are being offered.

433.305 “My Best Teachers Understood That Our Mental Health Was a Lot More Important:” Characterizing the Student-Teacher Relationships of Autistic Students and Their Impact on School Experiences

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Background: Autistic students often describe their school experiences as marginalizing, isolating, and marked by ableism and neuronormative expectations (Goodall, 2018; Parekh, 2023). The quality of autistic students’ relationships with teachers—be they positive and warm or conflictual and strained—may shape autistic students’ overall school experiences (McGrath & Van Bergen, 2015; Losh et al., 2022); however, existing research on the nature and impact of student-teacher relationship quality has focused almost solely on teacher reports of these relationships.

Objectives: To examine the nature of student-teacher relationships experienced by autistic students and the role of these relationships in shaping autistic students’ K-12 school experience and in furthering affirming or ableist experiences in school.

Methods: We conducted interviews with 19 autistic individuals (ages 15-43; 40% current high-schoolers; 47% people of color; 32%/32% women/non-binary) and gathered open-ended written responses from 52 teachers of autistic elementary-age students (90% with Master’s; 52% white; 94% women) in the U.S. Current findings reflect 19 autistic interviewees and 31 teachers; analyses is ongoing for the remaining 21 teachers. Using a critical constructivist qualitative approach informed by grounded theory, we coded interviews inductively. Written responses were coded deductively to determine whether teachers evidenced themes similar to students.

Results: Our results highlighted two dimensions of student-teacher relationships as central in shaping school experiences: *trust* and *humanization*. Further, positive student-teacher relationships were observed to be a foundation for resistance and affirmation, while strained student-teacher interactions served to perpetuate ableism and autism stigma. Within these two dimensions, key themes are italicized below.

First, beneficial student-teacher relationships were those in which teachers trust that students know themselves and their needs. This trust was marked by *attunement to students’ mental health and sensory needs* and *flexibility in responding to mental health and sensory needs*. When teachers demonstrated this trust in students’ self-knowledge and withstand dominant views of neurodivergent students, the resulting positive student-teacher relationship empowered both teachers and students to *resist ableist systems and structures*. On the other hand, when trust was absent, *teachers disbelieved autistic students* and *misperceived autism characteristics as misbehavior*.

Regarding humanization, strong student-teacher relationships were marked by teachers who viewed their students as whole people, for whom autism was a central but contextualized piece of who the student was. These teachers showed a *holistic interest* in students beyond their academic performance, and also brought their own *authentic selves*, such as by sharing aspects of their personal lives with students. These relationships in turn drove teachers to *reject dominant, negative views* of neurodivergent students. Alternatively, in strained student-teacher relationships, teachers often *endorsed dominant, dehumanizing views* around autism and neuronormativity. In turn, enforcing these neuronormative expectations and demands often triggered an *escalating cycle of harsh and exclusionary discipline*.

Conclusions: Findings suggest that student-teacher relationships may serve to foster affirmation and self-determination or, alternatively, perpetuate ableism, carcerality, and stigma, for autistic students. We will highlight recommendations for schools and teachers to develop student-teacher relationships that empower autistic students, encourage teachers to dismantle ableist school structures, and facilitate autistic students’ sense of belonging in school.

433.306 Trends and Variations in Prescriptions of Psychotropic Medications Among Autistic People Under Medicaid Coverage

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Background: Psychotropic medications are frequently prescribed for autistic people. Our recent work showed increased psychotropic medication use among privately insured autistic people. However, little is known about psychotropic use among autistic people covered by Medicaid.

Objectives: This study examined CMS's Medicaid claims databases on the trends and variation in prescriptions of psychotropic medications.

Methods: Using the 2008-2021 CMS MAXX/TAF® databases, Autistic people (aged 5 or older) based on diagnosis codes, ICD-9: 299.xx and ICD-10: F84.xx were identified. Annual trends and variations among sub-populations and polypharmacy, defined as prescriptions across multiple medication classes within 90 days, were examined. Psychotropic medications were categorized as: 1) antidepressants; 2) mood stabilizers/anticonvulsants; 3) antipsychotics; 4) anxiolytics; 5) stimulants; 6) non-stimulant ADHD medications. Descriptive analyses and multivariable regressions were performed to examine trends and variations among subpopulations, adjusting risk factors and confounders.

Results: Our study cohort consisted of 1,479,326 unique individuals, of which with 75.0% were males and 25.0% females, together contribute to 5,981,277 annual observations. The majority of the cohort (52.6%) are white, following by Hispanic, all races (18.6%) and Black, non-Hispanic (14.8%). Over half (52.8%) were of 5-12 years old, following those aged 13-15 (32.4%). Older adults (aged 50+) accounts for only 3.5% of the cohort. Most lived in the South US census region (34.1%), following by Northeast (22.9%), Midwest (21.7%), and the West (21.4%). Prescriptions of Antipsychotics had been in steady decline from 52.0% in 2008 down to 44.0% in 2019, then had a sudden drop in 2020 to 25.4%, perhaps due to the Covid-19 lockout, but rebounded in 2021 back to the prepandemic level at 44.4%. In contrast, prescriptions of antidepressants had been steadily increasing, from 31.6% in 2008 all the way to 51.0% in 2021. Patterns in prescriptions the other four classes of psychotropics have changed much less through the same years of observed in this study. (Figure 1A). Concurrent prescriptions of psychotropic medication from 3+ different classes had slightly increased from 29.5% in 2008 to 36.5% in 2021. The multivariable regression shows (Table 1) that autistic whites were at the highest risk of concurrent prescriptions of 3+ different classes of psychotropics, while in comparison, the Blacks were at relatively less risk: adjusted Odds Ratio (aOR) 0.59; 95% Confidence Interval (CI) [0.59-0.60]. So were the Hispanic, all races (0.59; [0.59-0.60]). Adolescent and young adults (age 13-25) had the highest risk (1.74; [1.73-1.76], reference age bracket: 5-12). Those who lived in the Midwest census region had the highest risk (1.03; [1.02-1.04]; reference: South) while those in the West had the lowest risk (0.61; [0.60-0.62]).

Conclusions: Our results show that while prescriptions of antipsychotics had been declining, prescriptions of antidepressants were on its way up instead. The white had the highest risk of concurrent prescriptions of 3+ different psychotropic classes. So were the adolescents and young adults. Future studies are warranted to examine the multi-level factors attributed for the prevalence of psychotropic polypharmacy and identify potential points of intervention.



433.307 Trends in Primary Care Provider Autism Diagnosis Among U.S. Children from 2013 to 2023: Effects of Child Age, Race and Ethnicity, and Poverty Level

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Background: Timely autism diagnosis by a trained specialist is typically a difficult and lengthy process, disproportionately affecting under-resourced families in the U.S. Primary care providers (PCPs) are often the first healthcare professionals to interact with children regularly, giving them the unique position to impact autism diagnostic delays. PCPs historically have not received training on how to diagnose autism and frequently refer children to specialty care providers for diagnosis. Given workforce shortages and high demand for autism diagnostic services, wait times are often long and can perpetuate inequities. To address these issues, PCP autism diagnostic training initiatives such as ECHO Autism-STAT are becoming more widespread. Little research has examined the effects of these initiatives across the U.S. and over time.

Objectives: Identify interactions of age, race and ethnicity, and income over time with the likelihood of PCP autism diagnosis among U.S. children ages 3-17 years from 2013-2023. We hypothesized significant trend changes in these interactions due to recent PCP autism diagnosis training initiatives and the potential effects of the COVID-19 pandemic.

Methods: This was a secondary analysis of census.gov yearly National Survey of Children's Health data from 2016 to 2023. Diagnosis year was constructed from the child age difference between time of survey completion and autism diagnosis. We only considered diagnosis after 2012 (2013 - 2023) to account for small cell sizes and changes in policy and practice (e.g., DSM-V criteria), and to reduce recall bias. Diagnosing provider types were collapsed into a binary response variable of PCP versus other providers. Diagnosis year, age at diagnosis, biological sex, race and ethnicity, language, income, confounding/differential diagnosis conditions, and functional impairment status were included as covariates. General Estimating Equations (GEE) were used to account for any covariance between observations due to survey structure. The model considers interaction terms between the diagnosis year and the other explanatory variables. A linear spline (knot = 2018, Figure 1) was used to better fit the interaction terms. Non-significant explanatory variables were removed until the most parsimonious model remained.

Results: The final GEE model results (Table 1) show several sign reversals for interaction term estimates around the 2018 knot. Lower household income was associated with a higher probability of autism diagnosis by a PCP vs non-PCP. The interaction term for lowest household income shows the likelihood of PCP diagnosis decreased pre-2018 but then increased post-2018. Similarly, the interaction term for Hispanic children vs. white non-Hispanic showed a decreasing likelihood of PCP diagnosis pre-2018 but then an increased likelihood post-2018. The probability of PCP diagnosis decreased for older children, and the interaction term showed a small but significant increase in this over time.

Conclusions: Results suggest PCP autism diagnosis has increased among U.S. children in the past decade. Children with lower household incomes, who are younger, or who are Hispanic were most likely to receive a PCP autism diagnosis, with the greatest increases in PCP diagnosis occurring after 2018. PCP autism diagnosis training initiatives may help to reduce persistent inequities in autism diagnosis.



433.308 Understanding Barriers to Inclusion in Elementary Education for Autistic Students

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Background: Autistic children in the School District of Philadelphia are primarily educated in segregated classrooms: Since 2008, the district experienced >500% increase in self-contained kindergarten-through-5th-grade autism support (AS) classrooms. Previous research indicates that most AS teachers favor increased inclusion but have concerns about general education teachers' preparation to educate these children (Rosen et al., 2018). The Philly Autism Instructional Methods Support (AIMS) program has attempted to increase inclusion in the district with limited success. Although district leaders recognize that segregation is neither best for students nor financially sustainable, they continue to rely heavily on self-contained AS classrooms.

Objectives: To elucidate barriers to inclusive education for autistic elementary school students in a large, urban school district.

Methods: We surveyed 33 AS teachers in 27 schools where Philly AIMS provides classroom consultation and 17 general education teachers at 1 school where Philly AIMS provides school-wide inclusion consultation. Teachers completed surveys on inclusive practices, inclusion barriers, and perceptions of inclusion success. Inclusive practices were defined by the number of AS students attending general education during the day and the percentage of the day they were included. Barriers were presented and ordered by frequency of endorsement. Perceptions of inclusion success were rated on a 5-point scale, where 5 represented the highest self-confidence in successfully preparing (AS) or including (general education) autistic students in general education. Survey data from AS teachers were collected at the beginning of the year and from general education teachers mid-year. Thus, AS teacher data represent a priori barriers and anticipated inclusion success, while general education data reflect barriers and success in practice. Descriptive analyses examined variation in inclusion across classrooms and alignment between a priori and in practice barriers. Ordinal regression and t-tests assessed whether teacher type predicted perceived inclusion success and whether average success ratings differed by teacher type.

Results: Data collection and analyses are ongoing. To date, both AS and general education teachers endorsed staffing, time for activities like joint planning and IEP meetings, and training as prominent barriers to inclusion. AS teachers were more likely to rate inclusion success higher than general education teachers ($p=.014$). AS teachers' mean success rating was 3.5, compared with general education teachers' average of 2.6 ($p=.007$).

Conclusions: Despite knowledge that children with autism should be placed in the least restrictive environment, the number of segregated elementary AS classrooms in this district is growing at an alarming rate. AS and general education teachers identify the same barriers to inclusion, emphasizing the need for more staff, time to plan for student movement from AS to general education classrooms (e.g., joint planning), and training. AS teachers' greater confidence in inclusion success highlights a misalignment in expectations between AS and general education teachers regarding inclusion. Given general education teachers' responsibility for inclusion, their confidence and buy-in are crucial for increasing inclusive practices. By the time of presentation, we will have increased sample size and will explore trends in inclusion practices over time and effects of district-level factors (e.g., school climate, leadership) on inclusive education.



433.309 Understanding Client Complexity: A Model for Clinical Case Management

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Background:

Over the last 20 years, ASD prevalence has substantially increased from 1 in 150 to 1 in 36 (Maenner et al., 2023). Behavioral health organizations and insurance companies are tasked with the responsibility of ensuring these individuals receive behavioral health care appropriate for their specific needs (Bottema-Beutel et al., 2020). Catalight is a large behavioral health organization serving over 20,000 people with I/DD, predominantly ASD (~95%). Catalight developed a comprehensive case management program to holistically serve their patient population, including a diverse multidisciplinary team. Clinical case notes are taken for every patient any time a clinical discussion occurs with their treatment team, family, the patient themselves, between the multidisciplinary team, and other clinical collaborators.

Objectives:

In this analysis we wanted to understand if the average number of clinical case notes over the course of their length of stay in their respective intervention predicted the client's complexity based on known factors of more difficulty to treat (e.g., parental stress, number of dangerous behaviors, older age, adaptive skills, etc.).

Methods:

To analyze this, we randomly sampled 2,000 patients' medical record and analyzed ~50 variables on each client utilizing a multiple linear regression. Upon identifying variables that significantly predicted the average number of clinical case notes, this model was then adapted into a simple algorithm which would predict based on client intake factors how much clinical case management each respective client would likely need over the course of their treatment.

Results:

The random sample included 2,000 patients, 1,000 who have discharged from treatment and 1,000 who were still receiving treatment. In the sample, 99% had a confirmed diagnosis of autism spectrum disorder based on the DSM-5 or DSM-IV criteria. The mean age of individual's included in the analysis was 5.5 ($SD = 4$) with a range of 1 year to 32 years. The average length of stay was 33 months ($SD = 19$) with a range of clinical case notes from 1 – 277 with an average of 21 clinical case notes ($SD = 18$).

Of the numerous variables included in the model, three variables significantly predicted the average number of clinical case notes: the number of dangerous behaviors the client exhibited ($\beta = .056$), age ($\beta = .08$), and a score of their daily living skills ($\beta = .02$) adaptive score from the Vineland-3.

Conclusions:

Upon identifying key variables that predicted case complexity, the authors developed an algorithm depicting relative complexity of the patient population which would then support both clinical case management and treatment planning. The original model of 2,000 patients found ~12% of the patient population would have relatively low complexity, ~80% of patients would have average clinical complexity, and ~10 would have relatively high case complexity. When applied to the total population of 20,000 patients 15% of the population was low complexity, 70% were average complexity, and 15% were high complexity. Upon reviewing with the multidisciplinary teams, this was reflective of their respective caseloads. This model will continue to be monitored and adapted over the next six months.

433.310 Understanding Patterns of Service Use for Autistic Adults: A Pilot of Life History Calendars

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Background: Life history calendars (LHC) are a tool for collecting retrospective data on a range of life events, including details on start date, duration, and overlap of life events. Included life events can cover a range of topics, including living arrangements, health status, and education. The visual of the calendar matrix assists participants with recalling timing of events. LHC can be used to understand patterns of service use, but this method has not been used with an autistic population, to the best of our knowledge.

Objectives: We sought to pilot the use of LHC for the autistic adult population as well as to describe patterns of service use.

Methods: The parents of 28 autistic adults participating in a study on aging completed LHC including events related to service receipt (e.g., applied behavioral analysis and occupational therapy), service dosage, and certain major life activities (e.g., employment and college attendance) from birth to time of data collection. Ages of autistic participants ranged from 18 to 49 (mean: 29.8; s.d.: 7.5). We used simple logistic regression to assess the association between service receipt and adult vocational outcomes (employment, college attendance).

Results: Overall, 64.3% received early intervention, 78.6% were ever in special education, 28.6% received Applied Behavior Analysis therapy, and 64.3% attended any preschool. 46.4% had ever seen a mental health therapist, while 64.3% were ever on psych meds. While 53.6% received Supplemental Security Income at some point, 60.7% were ever enrolled in Medicaid and only 18.5% received disability services. Additionally, 78.6% had ever been employed, 50% attended any college, and 57.1% received services from vocational rehab. Most participants received services in childhood. While 78.6% ever received speech therapy, only 21.4% received it as adults. Similarly, 60.7% received occupational therapy, but only 2 (7.1%) received it in adulthood. 17.9% received physical therapy in childhood, but none did as adults. Social skills trainings were received by 75% overall, but only 35.7% in adulthood. Preliminary findings suggest that ABA receipt in childhood was associated with 70.6% lower odds of ever being employed ($p=0.2$). Participation in vocational rehabilitation was associated with 44% greater odds of employment ($p=0.7$). Receipt of early intervention services was associated with being 72.8% less likely to ever attend college ($p=0.12$). Ever participating in social skills trainings was associated 89.8% lower odds of attending college ($p=0.05$).

Conclusions: LHC present a feasible and low-cost method for collecting retrospective data on service use and other life events for autistic adults. This can improve understanding of patterns of service use and major life events like educational attainment and important interpersonal relationships. Future work should aim to better understand how timing, dosage, and lifespan patterning of service utilization and significant life events affect outcomes that are meaningful to autistic.

433.311 A Qualitative Lens on the Role of Implementation Leadership in Supporting the Use of Ebps with Autistic Children in Inclusive Settings

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Background: In the United States, the Individuals with Disabilities Education Act (IDEA) requires autistic students to be educated in their least restrictive environment, which has increased their inclusion in general education settings. This has escalated the need for educators to effectively use evidence-based practices (EBPs) in schools. Numerous organizational factors, including implementation leadership, defined as behaviors that principals or other administrators do to support educators' use of EBPs with autistic students, play a crucial role in promoting and sustaining the use of EBPs among educators (Locke et al., 2019). Understanding how school leadership supports educators and paraeducators can lead to creating strategies that promote the successful implementation of EBPs and ultimately improve child outcomes (Cook & Odom, 2013).

Objectives: This project examines what implementation leadership looks like in public elementary schools within the context of EBP implementation with autistic students in general education settings.

Methods: In this mixed methods study, participants included 154 general education teachers, 137 special education teachers, and 62 paraeducators ($N=353$). Participants completed the School Implementation Leadership Scale (SILS), which is a 21-item rating scale with 7 subscales that assess the degree to which their school leader is knowledgeable (understands EBP and implementation), supportive (supports EBP adoption/use), proactive (anticipates and addresses implementation challenges), perseverant in implementing EBPs (responsive to challenges), communicative (bidirectional communication surrounding EBP implementation), centered on the school's vision/mission (integration of EBP implementation with core objectives), and available (accessible to staff needs/problems). Eighty-two participants were randomly selected for a semi-structured interview to discuss their high or low EBP implementation. These interviews lasted around 30-45 minutes, and participants were offered \$40.

Results: Aggregated mean scores on the SILS (Total $M=2.34$) subscales show how educators rate their school's leadership qualities (Table 1). These results illustrate that leadership provides moderate levels of support and availability, but demonstrates lower levels of being knowledgeable, perseverant, and proactive, with particularly weak communication around autism-focused EBP use.

Three independent coders developed a codebook for coding transcripts and reached interrater reliability (97%). Preliminary analyses show that educators desire leadership support through recognition, appreciation, and validation for their EBP implementation efforts. They also expressed the need for professional development for both educators and leadership, emphasizing the importance of knowledgeable leaders. Educators want leadership to provide time for collaboration and communication to discuss implementation strategies and EBPs during staff meetings, highlighting the need for communicative, proactive, and perseverant leadership. They also want the school's vision and culture to focus on collaboration and inclusivity, as it impacts their ability to properly implement EBPs.

Conclusions: The results suggest that implementation leadership within schools play an important role in fostering an inclusive environment for educators to implement EBPs for autistic youth. Leadership should continue to show support, availability, and knowledge. However, educators express a strong desire for more opportunities for collaboration and open, bi-directional communication with leadership. The results highlight the importance of having a strong leadership and an inclusive school culture to improve the implementation of EBPs and enhance outcomes for autistic students in general education settings.

433.312 Understanding the Barriers to Hiring Autistic People As Perceived By Employers in the UK

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Background: According to recent figures from the UK Labour Force Survey, only around 3 in 10 of autistic adults are in employment. The equivalent figure for disabled people overall is 5 in 10, versus 8 in 10 for non-disabled people. Further, employed autistic people are less likely to hold senior roles and they face the largest pay gap of all disability groups, suggesting that many in work are underemployed (ONS, 2023). Supporting more autistic people into employment is a major priority of the UK's National Autism Strategy (2021-2026). However, little is known about the barriers employers perceive to hiring autistic people.

Objectives: 1) To establish how much employers know about Autism; 2) To identify the barriers employers perceive to employing more autistic people; 3) To establish whether demographic factors influence intentions to employ autistic people.

Methods: A pre-registered mixed-methods survey was conducted on a nationally representative sample of 1212 individuals with recent hiring experience. The largest industry groups were in the educational, health/social work, manufacturing, information/ communication, financial/insurance, and science/technology sectors. Knowledge of Autism was assessed using the Autism Symptomatology Knowledge Assessment (ASKA) and the Autism Stigma and Knowledge Questionnaire (ASK-Q). Perceived knowledge of autism was assessed using the total score from McMahon's (2020) 6-item questionnaire. The Capability, Opportunity, Motivation – Behaviour framework (COM-B) and the Theoretical Domains Framework (TDF), were used to identify perceived barriers to hiring autistic people.

Results: Levels of Autism knowledge in this population were similar to those reported in other general population samples (ASKA mean = 18.6; ASK-Q mean = 41.4). It was noteworthy that perceived knowledge was not associated with actual knowledge on either scale. Encouragingly, intentions to hire autistic people and to make adjustments to the hiring process were high. However, there were key barriers around knowledge (e.g., of autism and adjustments), organisational processes (e.g., for making and monitoring adjustments) and strategies (e.g., personal hiring and working practices). Intentions to hire autistic people were higher for younger participants, men, people with higher levels of autism knowledge and those with more experience of previously hiring autistic people. Qualitative insights demonstrated that stereotyped beliefs about autistic people (e.g., lower productivity) and the consequences of hiring autistic people (e.g., higher costs) were present in the sample, as was the belief that some roles were unsuitable for autistic people (e.g., customer-facing roles).

Conclusions: This study demonstrated that important targets for intervention are improving employer knowledge of autism and building more inclusive hiring practices. These findings are significant for development of policies aimed at improving employment outcomes for autistic people.

433.313 Understanding the Substance Use and Mental Health Service Needs of Autistic Adults: Experiences, Insights, and Recommendations

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Background: Previously presumed to be rare, recently, there has been increasing recognition of the overlap between autism and substance use (Sinclair et al., 2023). Although research into the substance use of autistic people remains limited by sample size, scope, and inconsistent findings (Ressel et al., 2020), an emerging body of literature suggests that autistic individuals may be more likely to misuse substances and experience worse substance-related consequences than non-autistic individuals (Butwicka et al., 2017; Solberg et al., 2019; Weir et al., 2021), particularly when there is co-occurring attention deficit hyperactivity disorder (ADHD). Furthermore, traditional interventions for substance misuse may be poorly aligned with the unique needs of autistic individuals (Helverschou et al., 2019; Walhout et al., 2022) and autistic people may face numerous barriers to accessing substance use services (Brosnan & Adams, 2022). More information on the experiences of autistic people who have struggled with substance use is needed so that clinicians, service providers, and policymakers can create safe, effective, and accessible substance prevention and mental health support services for this population.

Objectives: This study aims to explore the experiences of autistic substance users.

Methods: Semi-structured interviews were conducted with diagnosed autistic adults who reported prior or current problematic substance use. Data collection began in May 2020 and is ongoing. Reflexive content analysis (Nicomis, 2024) will be used to identify themes and subthemes across autistic narratives of substance use in the following broad categories: patterns of substance use, perceptions of the relationship between substance use and autism, benefits and risks of substance use, and experiences with substance use and other mental health services including treatment effectiveness, barriers to engagement, and suggestions for improvement.

Results: 21 participants (10 male, 8 female, and 3 nonbinary) aged 20-55 ($M = 33.29$, $SD = 9.60$) have completed the interview to date. Thus far, our sample is predominately composed of White Canadian residents without intellectual disability. All participants have co-occurring psychiatric diagnoses, of which anxiety and ADHD are the most frequently reported. Cannabis was the most frequently reported substance used. Although participants' experiences of substance use and substance use services vary, common themes were identified, including substance use to manage autism-related difficulties and co-occurring mental and physical health problems, inaccessibility and limited provider knowledge of autism in mainstream mental health services, and the importance of harm reduction practices. Participants also provided recommendations to improve existing substance use and mental health services for autistic individuals, including autistic-led training, a neurodivergent affirming approach, and a focus on personalized support.

Conclusions: Many autistic adults reported engaging in substance use to self-medicate, particularly during stressful life events. Others perceived substance use as repetitive behaviour/restricted interest or as a compensatory strategy. The findings highlight the need for service providers to be aware of vulnerability to substance use among autistic individuals and to work collaboratively with autistic clients to effectively manage autistic and co-occurring mental health symptoms and substance use. Further research is required to understand the mechanisms underlying the coping and compensatory functions of substance use identified in this study.

433.314 Unintended Consequences: Declines in Vocational Rehabilitation Services and Outcomes Among Autistic Individuals Following Implementation of the Workforce Innovation and Opportunity Act

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Background: The federal Vocational Rehabilitation (VR) program is a critical public funder of employment services for autistic people. Yet, in response to stubbornly poor employment outcomes, despite decades of research showing pathways to career success, the Workforce Innovation and Opportunity Act (WIOA) became law in 2014 and implementation began in 2016. WIOA required states to shift 15% of their VR funding to Pre-Employment Transition Services (Pre-ETS) for students with disabilities without increasing overall VR state funding. WIOA also directed half of state supported employment funds to assist students with “most significant disabilities.” No studies have analyzed the effects of WIOA implementation on access to employment services and subsequent outcomes.

Objectives: To characterize changes in VR services and employment outcomes following WIOA implementation.

Methods: We analyzed VR service utilization and employment outcomes for 44,522 autistic individuals in FFY 2014-2016 (pre-WIOA) and 74,480 individuals in PY 2017-2019 (post-WIOA) using data from the Rehabilitation Services Administration 911 (RSA-911) database. We examined changes in demographics, VR services use, and outcomes using bivariate analyses and sequential multilevel regression models.

Results: Across years, autistic people who received VR services were on average younger at application (18 and under = 44% to 41%), more likely to be in high school (29% to 41%), and more often deemed “most significant disability” (70% to 81%) post-WIOA implementation. Receipt of all categories of VR services declined from pre- to post-WIOA including administrative (85% to 71%), job-related (68% to 52%), education/training (30% to 11%), and other (37% to 22%). Of 15 individual services evaluated, only one did not change: benefits counseling (5.7% vs 6.1%). Notably, post-secondary education and training fell from 8% to 3%, and supported employment fell from 24% to 18%. Finally, the percentage of autistic VR service users who were employed at VR exit fell from 60% to 49%. Services rates consistently declined across age groups (<18, 18-29, >29) and for all major service categories, and post-WIOA employment rates fell significantly across age groups. Education/Training services declined the most across age groups. Despite declines in delivery of traditional VR services, those who received job-related services were five times as likely to attain employment than those who did not receive job-related services. Odds of employment among those who were ages 30+ at VR application fell from 50% more likely to only 10% more likely after WIOA implementation, compared to those who were 18 and under.

Conclusions: The concept of “earlier is better” was the foundation of WIOA-driven shifts to deliver Pre-ETS to students with disabilities. However, the shifting of state VR funds toward Pre-ETS without an accompanying increase in VR dollars resulted in an overwhelming decline in receipt of almost every individual VR service type, and a significant decrease in rate of successful employment at VR exit. Deficient performance post-WIOA extended to middle and older age groups, indicating that declining VR performance was pervasive following WIOA implementation, generating significant concerns about implementation of WIOA’s mandated budget shifts. Examining post-COVID outcomes to evaluate trends is imperative as data become available.



433.315 Building Self-Compassion to Strengthen Well-Being: The Effectiveness of a Virtual Acceptance and Commitment Training for Family Caregivers of Autistic People

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Background:

Family caregivers of autistic people report higher stress, anxiety, and depression than other caregivers, yet few mental health services are available to them. Even fewer involve caregivers in their design and delivery. Our prior research demonstrated that our co-led and partnered, in-person, Acceptance and Commitment Training (ACT) program improved the wellbeing and psychological flexibility of family caregivers of people with neurodevelopmental conditions. With the onset of the pandemic, we adapted our intervention to be delivered virtually and studied its real world implementation in teams across Canada.

Objectives:

To evaluate the acceptability and effectiveness of a group-based, virtual ACT intervention, co-led by family caregivers and clinicians for caregivers of autistic people.

Methods:

A total of 85 family caregivers of autistic people participating in virtual ACT workshops across Canada consented to the research evaluation. We examined wellbeing measures (i.e., parental stress, low mood, mental well-being and resilience) and ACT process measures (fusion, flexibility, self-compassion and values) at pre-, post- and at 8-week follow-up using online surveys. We used repeated measures ANOVAs to examine changes across time. We used a multiple linear regression to examine the contribution of fusion, psychological flexibility, self-compassion and values after the program to the well-being outcomes found post-program.

Results:

Family caregivers' mean age was 47 ($SD = 10$, range: 19-69), cisgender women (81%), biological and adoptive parents (86%) of an autistic person, married (86%), attended college, university or postgraduate education (82.3%) and white (64%). Pre-to-post and pre-to-follow-up improvements in parental stress, mood, mental well-being and resilience were found ($ps < 0.01$) (see Table 1). Caregivers also reported being less fused (i.e., less glued to societal narratives) and, more psychologically flexible, self-compassionate and engaged in values-oriented living ($ps < 0.01$) (see Table 2). Finally, post-program self-compassion levels predicted changes to post-program measures of well-being, post-program values predicted lower post-program parental stress and higher post-program resilience, and post-program psychological flexibility predicted improved post-program mood.

Conclusions:

Our virtual ACT workshops hold potential to meaningfully improve skills like self-compassion and aspects of mental well-being among caregivers of autistic people. Findings represent an important step toward understanding the benefits of virtual ACT for this population when implemented in the community.



433.316 Unpacking the Implementation Climate in General Education Settings in Public Schools: A Sequential-Explanatory Mixed-Methods Study

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Background: The increasing prevalence of Autism Spectrum Disorder - impacting 1 in 36 children in the U.S. – significantly impacts public schools, where many autistic youth are either partially or fully included in general education settings. Several evidence-based practices (EBPs) are effective for autistic youth; however, EBP implementation across settings is impacted by various organizational-level factors. Implementation climate – the perception about whether use of the EBP is expected, supported, and rewarded by those intended to use the practice- is one of the strongest predictors of EBP use (Locke et al., 2021; 2022; Williams et al., 2022). Yet, little is understood about the implementation climate within general education in public schools; understanding this context is imperative to increase EBP implementation within these settings.

Objectives: We used a sequential explanatory design to explore the constructs comprising implementation climate in general education settings in public schools.

Methods: 154 general education teachers, 137 special education teachers, and 62 paraeducators (N= 353) completed the School Implementation Climate Scale (SICS), a 21-item rating scale made of up seven sub-scales: Focus on EBP, Educational Support for EBP, Recognition for EBP, Rewards for EBP, Use of Data to Support EBP, Existing Supports for EBP, and EBP Integration. A subset of 82 participants were randomly selected to complete semi-structured interviews, which further explored EBP use to support the inclusion of autistic children. Interviews lasted between 30-40 minutes. Participants were provided \$60 for completing surveys and \$40 for interviews.

Results: Aggregate mean scores on the SICS (Total $M = 1.77$) subscales illustrate educators' perceptions regarding implementation climate at their schools (Table 1). Results indicated a moderate focus and integration of EBPs in schools, some existing and educational supports, and recognition but limited use of rewards for EBP use.

Qualitative analysis began with developing a coding scheme. Three independent coders reached interrater reliability (97% average) on a subset of interviews. Qualitative analysis is expected to be completed by January, 2024. A consensus process is used to resolve discrepancies. Preliminary qualitative analyses revealed that EBPs such as reinforcement are well integrated into some schools. However, findings indicated that general education teachers in particular may benefit from additional education supports (e.g. access to education, training, professional development) in order to increase buy-in and "ownership" of using EBPs with autistic youth. Educators also reported that with a greater push for inclusion of autistic youth in general education settings, there is a need for increased recognition of efforts to use EBPs in these contexts.

Conclusions: Results illustrate educators' current perception of implementation climate within general education settings. Educators report an increased emphasis on inclusion of autistic youth in general education classrooms. However, both quantitative and qualitative results indicate limited access to supports, data, rewards, and recognition for using EBPs with autistic youth in these settings, particularly for general education teachers. Findings highlight that implementation of EBPs does not occur in isolation, and that it is imperative to consider organizational constructs such as implementation climate when implementing EBPs to support autistic youth in general education settings.

433.317 Using Practitioner-Implemented Video Models to Teach Vocational Social Skills in a Rural Public School

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Background:

Young autistic adults and adults with intellectual disability (ID) regularly experience lower employment rates compared to peers with and without disabilities. These individuals often require additional support to learn social skills commonly used to solve problems and interact with coworkers on the job. In rural U.S. communities, students may lack access to job experiences or related service providers to support them in acquiring these skills resulting in the need for high-quality, classroom-based interventions. Video modeling (VM) is an effective intervention for teaching a variety of skills to autistic individuals and individuals with ID, including social skills. However, fewer studies examine the effects of VM to teach vocational social skills (VSS) and most studies occurred in non-classroom settings.

Objectives:

This study was designed to test the effects of VM plus feedback to teach VSS to young adults on the autism spectrum or with ID in a rural public school classroom, and to assess for generalization to a community-based work setting. We interviewed each participant, their teacher, and their caregiver to assess vocational needs and used this information to inform our procedures to increase the relevance of the intervention to students in a rural community.

Methods:

This study used a multiple probe across behaviors design and occurred in rural public school post-high transition program. Two male autistic students (ages 17 and 20) and one female with ID (age 21) participated, and an instructional assistant served as the intervention agent. We used interviews to align our procedures with participant goals then conducted a VSS assessment (Lerman et al., 2017) to identify three behavioral targets per participant. Targeted skills included common VSS and problem-solving skills requiring social interaction such as responding to missing materials or notifying the supervisor when you complete a task. We implemented the intervention in the classroom using a simulated workplace setting. Following intervention we conducted probes to assess generalization of skills to a new supervisor then conducted probes in a community-based work setting to assess generalization. Each participant rewatched the video models then had an opportunity to engage in each learned skill. Finally, we used a brief interview to assess for social validity and assessed for maintenance during a two-month follow up.

Results:

The intervention was effective at increasing the use of VSS in a simulated work setting within the classroom when implemented by a practitioner (see Figures). Additionally, participants successfully utilized learned skills in a community-based work experience and maintained most of the skills two months following intervention. Generalization to a new implementer was mixed. Participants indicated the intervention was enjoyable, effective, and useful.

Conclusions:

Students with autism or ID often require additional instruction to learn common VSS, and resources can be lacking in rural schools. Conducting these interventions in the classroom can be an accessible way for teachers in rural public schools to teach critical transition-related skills without requiring access to community work experiences. These results suggest that VM plus feedback can successfully teach VSS in the public school and generalize these skills to a work setting.



433.318 What It Takes to Recruit Underrepresented Populations: Recruitment and Retention of Low-Resourced Families with an Autistic Child

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Background: Lack of representation from minority and low-income families in autism research has impacted the field for years and lends itself to systemically erasing narratives from populations that need support. This can be especially detrimental for racial minority and low-resourced families with an autistic child, who are often not sufficiently represented in research to identify health disparities¹. Previous literature has described inaccessibility of research materials among the barriers to participate in research for Black families with an autistic child². Similarly, socially disadvantaged individuals demonstrate poor retention in medical research due to factors such as an inability to remain in contact with researchers, practical barriers, and forgetting to participate in follow-up visits³. To eradicate these barriers, the current study describes the efforts needed to recruit and retain low-resourced families with autistic children in two urban healthcare networks.

Objectives: Compare the recruitment and retention of a predominately low-resourced sample of families with an autistic child for follow-up versus cross-sectional recruitment and reflect on methods utilized to increase research accessibility.

Methods: Families of autistic children aged 6-11 years who had previously participated in a randomized controlled trial of Family Navigation^{4,6} as a facilitator for early autism diagnosis at either Boston Medical Center or Children's Hospital of Philadelphia (EARLY; $N = 60$) and a comparison group of age-matched autistic children receiving care in either setting (Community; $N = 48$), were contacted to participate in a study examining the impact of early autism diagnosis upon child behavior and treatment service receipt. Research staff documented the number of texts, emails, phone calls, and mailings they sent participants for both recruitment and retention purposes (i.e., completion of parent questionnaires and child diagnostic evaluation) to examine whether these strategies differed between study cohorts.

Results: There were no statistically significant differences in age, gender, Hispanic ethnicity, and receipt of government assistance between the two cohorts. There was a trend toward a difference in participant race ($p=0.08$), with more Black families in the EARLY cohort. (Table 2). In order to recruit and retain a high number of EARLY Cohort families ($n=60$ of 137 eligible families; 44EARLY Cohort families required an average of 9.4 contacts, while the Community Cohort families required an average of 4.7; $p < 0.01$, calculated by a Welch two-sample t-test).

Conclusions: There is an essential need to include families of low-resourced backgrounds in research to create representative samples and identify barriers or disparities in healthcare. This is supported by the increased recruitment and retention efforts required for the EARLY Cohort.

Recruitment of low-resourced longitudinal samples requires different effort than low-resourced cross-sectional samples. Breaking down resource barriers like transportation, food, and cost for the research study allowed more families to participate that can play a critical role in autism research to better understand the systemic barriers and disparities that exist in this population.

433.319 Trauma and Autism: The Use of the Echo Autism: Advanced Diagnosis Program to Support a Population in Need

V. Nanclares-Nogues¹, A. Brewer Curran², M. Odum³, J. N. Constantino⁴, K. Sohl⁵, M. Mahurin⁶, K. Boles⁷ and L. Nebeker⁸, (1)Pediatrics, University of Missouri - Columbia School of Medicine, Columbia, MO, (2)Department of Pediatrics, University of Missouri, Columbia, MO, (3)ECHO Autism Communities, University of Missouri, School of Medicine, Columbia, MO, (4)Children's Hospital of Atlanta, Atlanta, GA, (5)ECHO Autism Communities, University of Missouri School of Medicine, Columbia, MO, (6)Department of Child Health, University of Missouri, School of Medicine, Columbia, MO, (7)Child Health, University of Missouri, Columbia, MO, (8)Autism Society of America, Alexandria, VA

Background: In recent years, research has shown a greater risk of adverse events and trauma in people on the autism spectrum, particularly those assigned female at birth (AFAB). The presence of trauma can complicate the overall clinical presentation, requiring clinicians to be appropriately trained to understand and address this need. ECHO Autism: Advanced Diagnosis (ADx) equips community diagnosticians with the skillset needed to provide comprehensive autism evaluations for people of all genders across the lifespan who have complex or nuanced presentations. Through case-based learning, the ECHO Autism: ADx program guides and supports community-based diagnostic clinicians in providing best-practice autism diagnostic evaluations throughout the lifespan. The current study analyzed data from case presentation forms completed by the presenting clinicians.

Objectives: To increase the capacity of local clinicians in underserved areas who can provide high-quality, best-practice autism evaluations for patients of all ages and genders. The analysis seeks to identify how many people out of the ECHO Autism ADx dataset are at a greater risk for adverse events and trauma and to explore the impact of underrepresented groups (AFAB) being diagnosed by community-based diagnosticians. **Methods:** Community diagnosing clinicians (i.e., psychologists and select physicians) participated in a year-long program of virtual case-based learning sessions. In these sessions, clinicians presented de-identified cases from their practice to a multidisciplinary team of experts, as well as colleagues in the community, for clarification and guidance. Prior to presenting, a community clinician filled out a deidentified case presentation form through a secure data capture system (REDCap) about an existing patient. The case form included demographic information, developmental, medical, and behavioral findings, including trauma related experiences, and DSM-5 diagnostic criteria. Data from the case presentation forms, collected between 2019 and September 2024, were analyzed to understand age, gender, and trauma-related experiences documented in the case forms.

Results: Out of 121 cases presented, 57% were assigned male at birth (AMAB) with an average age of 9.6 years (range: 2.5-33 years), while the average age for AFAB individuals was 14.72 years (range: 3-44 years). 119 had information about trauma-related experiences. AFAB cases were found to be older at diagnosis and more likely to have experienced trauma. AFAB cases were reported to be 1.27 times more likely to have experienced abuse, 7.44 times more likely to have experienced sexual trauma, and 1.93 times more likely to have experienced physical trauma compared to AMAB cases. Additionally, adults (19 and over) were significantly more likely to have experienced abuse, sexual trauma, or physical trauma than non-adult (18 and younger) cases (69%, 50%, and 40% respectively).

Conclusions: ECHO Autism: Advanced Diagnosis has demonstrated the ability to increase the self-efficacy of clinicians to diagnose and care for patients with autism (Nanclares et al., 2023). The current data analysis supports recent findings that people with autism are at greater risk for adverse events and trauma, in particular AFAB individuals. In addition, the data shows that the program is supporting clinicians who are caring for an often underrepresented and underdiagnosed population.

433.320 Unlocking the Spectrum: The Use of the Echo Autism: Advanced Diagnosis Program to Enhance Access to Diagnosis across the Lifespan for All Genders.

V. Nanclares-Nogues¹, M. Odum², A. Brewer Curran³, J. N. Constantino⁴, L. Nebeker⁵, M. Mahurin⁶, K. Boles⁷ and K. Sohl⁸, (1)Pediatrics, University of Missouri - Columbia School of Medicine, Columbia, MO, (2)ECHO Autism Communities, University of Missouri, School of Medicine, Columbia, MO, (3)Department of Pediatrics, University of Missouri, Columbia, MO, (4)Children's Hospital of Atlanta, Atlanta, GA, (5)Autism Society of America, Alexandria, VA, (6)Department of Child Health, University of Missouri, School of Medicine, Columbia, MO, (7)Child Health, University of Missouri, Columbia, MO, (8)ECHO Autism Communities, University of Missouri School of Medicine, Columbia, MO

Background:

The rise in autism prevalence has outpaced the number of professionals needed to meet the demand (Smith et al., 2020). More recently, there has been an increase in referrals for women and individuals throughout the lifespan. The ECHO Autism: Advanced Diagnosis (ADx) program was developed to address the diagnostic gap for individuals of all ages whose presentation may be more complex or nuanced. Through case-based learning, the ECHO Autism: ADx program guides and supports community-based diagnostic clinicians to provide best-practice autism diagnostic evaluations across the lifespan. The current study analyzed the data from the case presentation forms completed by presenting clinicians within the ECHO Autism: ADx program.

Objectives:

Increase local capacity of clinicians in underserved areas who can provide high-quality, best-practice autism evaluations for individuals of all ages and genders to decrease wait times and improve access to diagnostic assessments by well-equipped community clinicians.

Methods:

Community diagnosing clinicians (i.e., psychologists and select physicians) participated in a year-long program starting with an ADOS-2 introductory training, followed by participation in twice-monthly, 90-minute ECHO Autism virtual case-based learning sessions, where clinicians present de-identified cases from their practice for clarification and guidance to a multidisciplinary team of experts, as well as to community colleagues. Participating clinicians complete pre- and post-surveys regarding self-efficacy, knowledge, and satisfaction with the program. Additionally, data are collected on the types of individuals being evaluated by the ECHO Autism clinicians through case presentation forms. Each community clinician completes a deidentified case presentation form through a secure data capture, REDCap, with information regarding age, gender, developmental history, family history, evaluation measures/results, behavioral observations, and final diagnostic determination according to DSM-5 criteria. Data were analyzed from the case presentation forms between 2019 and September 2024.

Results:

121 cases were presented (57% male) with an average age 9.6 years for male (range 2.5-33 years) and 14.72 for female individuals (range 3-44 years). Notably, a near equal proportion of male and female cases were presented for discussion, an interesting finding given the nuances often associated with the evaluation of female cases. 106 cases had documented wait time to see an ECHO Autism clinician: 77 (73%) were seen in less than three months, 95 (90%) were seen within 6 months. The median wait time was 1-3 months, in contrast to the state median wait time of 7.6 months (2023 DMH report).

Conclusions:

ECHO Autism: ADx has demonstrated the ability to increase clinician self-efficacy to diagnose and care for individuals with autism (Nanclares et al., 2023). The current study shows that wait times have been reduced by more than half, and females are being evaluated at nearly the same rate as males. The program is also supporting clinicians who are caring for individuals of all ages and genders with complex and nuanced presentations, an often underrepresented and underdiagnosed population. Notably, there is extremely limited access for adult autism evaluations at Missouri's Autism Centers of Excellence. This program has expanded access to adults, highlighting the impact of this program on autistic individuals across the lifespan.

433.321 Understanding Service Barriers to Improve Autism Supports for Indigenous Families in Canada

V. C. Fong¹, M. Schneider² and J. McLaughlin², (1)The University of British Columbia, Burnaby, BC, Canada, (2)Wilfrid Laurier University, Waterloo, ON, Canada

Background: Canada's Constitution recognizes three distinct Indigenous groups—First Nations, Métis, and Inuit—which together comprise approximately 1.8 million individuals, or about 5% of the nation's total population (Statistics Canada, 2022). Previous research has demonstrated that Indigenous parents in Canada face compounded challenges when trying to access autism services for their children. To address these inequities, it is crucial to consider the role of service providers, who are instrumental in supporting families and helping them navigate complex systems of care. Their perspectives can provide valuable insights into systemic and institutional barriers that Indigenous families encounter when accessing services. By examining the experiences of both Indigenous caregivers and service providers we may improve our understanding of the challenges families face and better guide the development of more equitable support systems.

Objectives: The objectives of the current study were to understand the main barriers that Indigenous families face when accessing autism services for their children and to explore potential solutions for improving both access to and quality of those services.

Methods: Twelve service providers with a minimum of one year of experience working with Indigenous families of autistic children in Ontario were recruited for participation in interviews. Interviews were transcribed and coded. Data analysis involves using a thematic approach. In addition, Indigenous parents are also being recruited and their perspectives will be incorporated into the findings.

Results: Indigenous families face significant barriers when accessing services for their children, including geographic isolation, historical trauma, and administrative delays. Geographic isolation often limits the availability of nearby services and can create transportation challenges, making it difficult for families in remote areas to attend appointments. Historical trauma can fuel mistrust in service providers, resulting in families being reluctant to seek assistance. Additionally, burdensome paperwork and slow processing times create bureaucratic barriers that delay access to essential services. Solutions for addressing these barriers included capacity building through training local professionals and leveraging existing expertise within Indigenous communities to enhance cultural competence and foster trust. Additionally, increasing awareness and implementing outreach initiatives can help families navigate available services more effectively.

Conclusions: Overall, these findings provide insight into the various challenges that Indigenous families experience and highlight possible strategies for improving equity in service provision.

433.322 Promoting Equity in Autism Services for Newcomer Families: Insights from Parents and Service Providers

V. C. Fong¹, J. McLaughlin² and M. Schneider², (1)The University of British Columbia, Burnaby, BC, Canada, (2)Wilfrid Laurier University, Waterloo, ON, Canada

Background: Newcomers represent a growing population in Canada, with recent data indicating that 437,180 immigrants arrived in 2022, over 40% of whom settled in Ontario. Although many newcomers move to Canada seeking better support for their families, previous research has shown that they continue to face significant barriers to accessing services. Recognizing the role of service providers in bridging these gaps and helping families navigate these challenges, it is crucial to explore their perspectives. Their insights can help shed light on systemic and organizational barriers that newcomer families encounter when seeking supports. By examining the views of both newcomer parents and service providers we can enhance our understanding of these challenges and inform the development of more equitable support systems.

Objectives: The objectives of the current study were to understand the main barriers that newcomer families face when accessing autism services for their children and to explore potential solutions for improving both access to and quality of those services.

Methods: Fifteen service providers with a minimum of one year of experience working with newcomer families of autistic children in Ontario were recruited for participation in interviews. Interviews were transcribed and coded. Data analysis involves using a thematic approach. In addition, newcomer parents are also being recruited and their perspectives will be incorporated into the findings.

Results: Newcomer families experience barriers related to having unmet basic needs, fragmented care, and a lack of culturally responsive services. Newcomer families often experience challenges related to housing and employment, impacting their ability to focus on their child's service needs. Additionally, fragmented care and service silos can lead to inconsistent support, making it difficult for families to navigate the system. The lack of culturally responsive services can further alienate families, as they may feel that their needs and values are not understood or respected. Solutions included creating more access points in the community, such as local service hubs that offer families opportunities to access tailored information and support. Training and education for professionals on current policies and services can improve their ability to assist families effectively. Lastly, enhancing cultural responsiveness among service providers can help create a more welcoming environment for families from diverse backgrounds.

Conclusions: Together these findings provide insights into systemic challenges, gaps in service provision, and suggest potential strategies for improving access to and the quality of autism services for this underserved population.

Virtual Poster Session

104 - Dissertation Awards, Early Career Investigator Awards, and Keynote - Karen Adolph

May 3rd, 2025, 8:30 AM - 10:00 AM - 6ABC

Award Presentations</p> Dissertation Awards Early Career Investigator Awards <p>Day 3 Welcome Remarks</p>
<p>Keynote Address - Karen Adolph - "How Behavior Develops"

Keating

C. T. Keating, School of Psychology, University of Birmingham, Birmingham, United Kingdom

Keynote

K. Adolph, New York University, New York, NY

Panel Session

219 - Executive Function Development in Autism: Multimodal Insights into Early Indicators, Neural Mechanisms, and Outcomes

May 3rd, 2025, 10:30 AM - 12:30 PM - 6B

Panel Chair: Erin Kang, *Department of Psychology, Montclair State University, Montclair, NJ*

Discussant: So Hyun Kim, *School of Psychology, Korea University, Seoul, Seoul, Korea, Republic of (South)*

This panel provides critical insights into key aspects of executive function (EF) development in both autistic and non-autistic children. Presenting findings from robust, well-characterized samples, the session highlights the distinct behavioral and neural mechanisms underlying EF, as well as its impact on academic, social, and developmental outcomes. The panel will explore attention mechanisms, such as focused attention and vigilance, in early development in infants with elevated likelihood for autism, ADHD, or NF1. One presentation will examine differences in early EF development between autistic toddlers and preschoolers compared to non-autistic peers, exploring neural correlates of EF. Additionally, the role of EF in predicting academic and social outcomes in autistic kindergarteners will be discussed using a multimodal measurement approach. Moreover, distinct neural markers of cognitive flexibility, assessed through event-related potentials (ERPs), and their relationship to both performance-based and real-world behaviors, will be compared between autistic and non-autistic youth. Overall, by examining EF across multiple levels of analysis and from various disciplines, these presentations contribute to a deeper understanding of early EF indicators, neural markers, and their potential to inform targeted interventions that promote cognitive development and improve school and social outcomes.

Introduction

E. Kang, Department of Psychology, Montclair State University, Stony Brook, NY

219.001 Focused Attention and Vigilance in 10- and 14-Month-Olds at Elevated Likelihood for Autism/ADHD or with NF1

F. Penza¹, T. Bazelmans^{1,2}, J. Begum Ali³, T. Charman¹, M. H. Johnson^{1,5} and E. Jones^{6,7}, (1)Centre for Brain and Cognitive Development, Birkbeck, University of London, London, United Kingdom, (2)Department of Psychology, Institute of Psychiatry, Psychology & Neuroscience, King's College London, London, United Kingdom, (3)Centre for Brain and Cognitive Development, Birbeck, University of London, London, United Kingdom, (4)Department of Psychology, Institute of Psychiatry, Psychology & Neuroscience, King's College London, London, United Kingdom, (5)Department of Psychology, University of Cambridge, Cambridge, United Kingdom, (6)Centre for Brain and Cognitive Development, Birkbeck University of London, London, United Kingdom, (7)Department of Child and Adolescent Psychiatry and MRC Centre for Neurodevelopmental Disorders, Institute of Psychiatry, Psychology & Neuroscience, King's College London, London, United Kingdom

Background:

Attention is one of the early mechanisms that has been found to be associated to different neurodevelopmental conditions including autism and ADHD and is thought to be a critical component to the emergence of executive functions. In infancy, attention control is often measured by measuring the time an infant is engaged with a stimulus (ie. focussed attention [FA]), however the ability to maintain attention after stimulus presentation, which is a form of sustained attention, or vigilance, has been less studied.

Objectives:

Here we compare FA, vigilance and movement during a puppet paradigm in a group of infants enriched for diverse developmental outcomes, including autism and ADHD traits.

Methods:

171 infants were seen at 10 and/or 14 months as part of a prospective, longitudinal infant sibling study: 29 Typical likelihood (TL), 80 Elevated likelihood (EL)-autism, 32 EL-ADHD, 20 EL-autism+ADHD & 35 diagnosed with NF1. Infants took part in a live puppet performance where the puppet would appear in the same spot from behind a curtain five times for 4-8 seconds. After each appearance there was a break period during which nothing was presented. The breaks were 25, 15, 15, 5 and 25 seconds long. We coded the videos offline for looking behaviour to measure proportion of looking at the puppet (FA) and proportion of time looking where the puppet was during breaks (vigilance). Movement was measured using an accelerometer (Biopac) attached to the child's foot and average amount of movement during FA, vigilance and looking elsewhere were calculated. We used mixed models to look at the effect of group, condition and their interaction. We included time (10 vs 14 months) and its interaction effect with group and condition, but this was not significant. Parents reported on ADHD and autism traits at 36 months using the Child Behaviour Checklist and Social Responsiveness Scale.

Results:

For looking, there was a significant condition ($p < .001$), group ($p < .001$) and interaction ($p = .004$) effect. As expected, infants showed more FA (.79-.90) compared to vigilance (.16-.25). To parse out the results of the interaction effect, we ran two separate mixed models. The NF1 group showed less FA compared to the TL, EL-autism and EL-ADHD groups. The NF1 group also showed less vigilance compared to the EL-autism, but not the other groups. As expected, movement was lowest during FA, higher during vigilance and highest when looking elsewhere ($p < .001$). No group or group x condition interaction effects for movement were found. Less FA at 10 months was associated with more ADHD traits at 3 years (Kendall tau: -.19, $p = .008$), but not at 14 months (-.13, $p = .065$) or with autism traits ($p > .408$).

Conclusions:

Children diagnosed with NF1, but not EL-autism and EL-ADHD, show difficulties with FA from 10 months and FA at 10 months associates with later ADHD traits. The ability to maintain attention to a stimulus might be more critical at this age and the skills to control attention over sustained periods of time may still be emerging, although vigilance should be studied at later timepoints to confirm this.



219.002 Measuring Early Executive Function Differences in Autistic Toddlers and Preschoolers

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Background: Executive function underlies a variety of important developmental outcomes, suggesting that better understanding of its developmental course could provide key information about developmental trajectories and intervention outcomes in autism. Yet, there is little work examining the early development of executive function in autistic toddlers and preschoolers.

Objectives: To determine whether executive function is unitary or multidimensional among toddlers and younger preschoolers. To determine whether autistic toddlers and preschoolers exhibit differences in executive function relative to non-autistic peers. To explore neural correlates of executive function.

Methods: The sample included 132 two-year-olds (65.6% autistic) and 101 four-year-olds (61.4% autistic). Children completed an executive function battery that included working memory, set-shifting, inhibition, and delay tasks. Each domain was measured using at least two tasks – one was developmentally appropriate for the chronological age of the sample and the other was sensitive to executive functioning as early as 12 months of age. One-, two-, and four-factor confirmatory models were tested to evaluate the factor structure of executive function in both age cohorts. Then ANCOVAs were computed using factor scores between diagnostic groups controlling for nonverbal developmental level. Electroencephalography was collected during a non-social resting task, the Child Attention Network Task, and the Dimensional Change Card Sort Task.

Results: The one-factor solution best fit for both the two-year-old ($rs = .337-.794$) and four-year-old ($rs = .494-.813$) cohorts. Within the two-year cohort, controlling for nonverbal developmental level, executive function differed between the diagnostic groups, $F(1,128) = 25.46, p < .001$. We further examined group differences among two-year-olds with nonverbal developmental quotients of 80 or above ($n = 31$ autistic, $n = 34$ non-autistic) and found executive function also differed by diagnosis, $F(1,62) = 21.35, p < .001$. Within the four-year cohort, controlling for nonverbal developmental level, executive function differed between the diagnostic groups, $F(1,97) = 7.50, p = .007$. We further examined group differences among four-year-olds with nonverbal developmental quotients of 80 or above ($n = 27$ autistic, $n = 35$ non-autistic) and found executive function also differed by diagnosis, $F(1,59) = 12.01, p < .001$. Autistic children had lower executive function scores than non-autistic children across all four comparisons. Analyses are ongoing for resting EEG and event-related tasks related to executive function.

Conclusions: Results provide support for unitary executive function during toddlerhood in a transdiagnostic sample that included autistic, developmentally delayed, and neurotypical children. Using a robust measure of executive function that addresses potential limitations related to task impurity and sensitivity to executive function performance at a range of developmental levels, we detected group differences between autistic and non-autistic toddlers and preschoolers above and beyond nonverbal developmental level. This suggests that autistic children experience delays in this key cognitive domain as early as age two that continue throughout preschool. We will also examine neural correlates of early cognitive differences.

219.003 Executive Function Predicts Academic and Social Skills in Autistic Kindergartners Based on a Multimodal Approach
A. B. Choi¹, **H. Lee¹**, **L. Kuhn²**, **J. Kim³**, **S. J. Hong⁴**, **A. Di Martino⁵**, **F. J. Morrison⁶**, **C. Lord⁷** and **S. H. Kim⁸**, (1)Korea University, Seoul, Korea, Republic of (South), (2)Frank Porter Graham Child Development Institute, University of North Carolina, Chapel Hill, NC, (3)Korea Institute of Science and Technology, Seoul, Seoul, Korea, Republic of (South), (4)Center for Neuroscience Imaging Research, Institute for Basic Science, Suwon, Gyeonggi-do, Korea, Republic of (South), (5)Child Mind Institute, New York, NY, (6)Department of Psychology, University of Michigan, Ann Arbor, MI, (7)UCLA Semel Institute for Neuroscience and Human Behavior, Los Angeles, CA, (8)School of Psychology, Korea University, Seoul, Seoul, Korea, Republic of (South)

Background: Many autistic individuals experience challenges with executive function (EF), which is a set of higher-order cognitive processes that underlie goal-directed behaviors (Lezak et al., 2012). These difficulties persist across the lifespan (Demetriou et al., 2018; Dijkhuis et al., 2020), emphasizing the need to explore EF in early childhood, particularly during the transition to formal schooling, before academic and social demands increase. While EF is a well-established predictor of academic and social success in neurotypical children (Blair & Raver, 2015; Kuijper et al., 2017), its role in the development of autistic children remains less clear. Further, previous research often lacks a comprehensive, multi-measurement approach to studying EF, highlighting the need for better understanding of how EF influences academic and social outcomes in autistic children, as they transition to school.

Objectives: Using a multimodal approach to EF measurement, we aimed to address the following research questions: (1) Do EF skills relate to current and future reading and math achievement in cognitively able, verbal autistic kindergartners? (2) Are EF skills associated with current and later social skills in autistic kindergartners?

Methods: Participants included 67 autistic kindergartners (18 females, 26.9%) aged 4 to 6 years. All children had an ASD diagnosis confirmed by the ADOS-2 (Lord et al., 2012) and no intellectual disability and used complex sentences. EF was measured through a computerized battery (EF Touch), behavioral observation (Head-Toes-Knees-Shoulders), and parent report (Behavior Rating Inventory of Executive Function). Academic achievement and social skills were assessed using standardized assessments (Woodcock-Johnson III – Tests of Achievement and Penn Interactive Peer Play Scale). All measures were administered at kindergarten-entry and -exit. Multiple regression models were conducted to explore the concurrent and predictive associations of EF with academic/social outcomes, controlling for covariates (e.g., age, sex).

Results: (1) EF, assessed through the computerized battery, was significantly positively associated with concurrent reading and math performance at both kindergarten- and -exit, even when controlling for age, sex, and cognitive ability. Additionally, longitudinal analysis revealed that children with better EF skills at kindergarten-entry had significantly higher math scores by kindergarten-exit (Figure 1). (2) Parent-reported EF difficulties were significantly positively linked to both current and future peer play challenges, suggesting that children with greater daily EF impairments exhibited more aggressive behaviors and reduced social engagement during peer interactions (Figure 2). Together, these findings indicate that different EF measurement approaches provide complementary insights, capturing the diverse range of EF abilities of autistic kindergartners and their role in academic performance and social functioning.

Conclusions: These findings indicate that EF may be critical foundational skills for academic and social development in young autistic children during school transition. Therefore, targeted EF interventions could be a powerful way to maximize school readiness and social skills for autistic children, providing them with the necessary tools to succeed in various domains of their lives. The results also highlight the importance of a multidimensional approach to EF assessment, as it provides a more comprehensive understanding of the broader impact of EF on key developmental outcomes of autistic children.



219.004 Neural Correlates of Cognitive Flexibility Differences in Autistic and Allistic Youth

E. Kang¹, **R. G. McDonald¹**, **R. Ahmad²** and **D. Wallace³**, (1)Department of Psychology, Montclair State University, Montclair, NJ, (2)Montclair State University, Montclair, NJ, (3)Library Administration, Montclair State University, Montclair, NJ

Background: Cognitive flexibility (CF) is a facet of executive function reflecting the ability to shift thoughts and attention according to changing situational demands. Growing body of literature highlights CF differences in autistic individuals and its association with autistic traits (Lage et al., 2023), including patterns of restricted and repetitive behaviors (RRBs; Miller et al., 2015). However, CF is a multifaceted, complex construct, and ecologically-valid measures of everyday CF and performance-based measures likely target distinct CF aspects (Uddin, 2021). Yet, virtually no study has examined CF in autistic youth incorporating across multiple levels of analysis and there is limited understanding of the underlying brain mechanisms. Event-related potentials (ERPs) indexed by electroencephalography (EEG) provide an ideal method for such investigations, as they are closely linked to individual differences in CF and may clarify similarities and distinctions between cognitive processes reflected by these markers.

Objectives: 1) To validate a novel, developmentally-appropriate, computerized CF task in a well-characterized sample of autistic and allistic youth, and demonstrate that the task elicits dissociable ERP indices of CF, and 2) to examine how ERP indices relate to lab-based EF task and everyday EF measures and RRBs.

Methods: Participants included 72 school-aged youth (41 autistic via ADOS-2; 55% male, $M_{age}=10.48$, $SD_{age}=3.07$; $Range_{IQ}=60-140$; 55.4% white; 7.7% Black/African American; 6.1% Asian; 1.5% Native American; 6.2% MENA; 20% multiracial) and their parents. Youth completed a modified version of the Wisconsin Card Sorting Task, while EEG data were recorded. Switch positivity (SwP), indexing set-shifting, and reward positivity (RewP), indexing reinforcement learning, were extracted. Youth were also administered performance-based CF task (D-KEFS Color-Word Interference [CWI], Trails, Design Fluency [DF]; Delis et al., 2001). Parents and youth completed ecologically-valid measures of CF (Flexibility Scale [FS]; Strang et al., 2017; BRIEF-2; Gioia et al., 2015). Parents also completed Repetitive Behavior Scale-Revised (RBS-R; Bodfish et al., 2000).

Results: SwP correlated with CWI_Inhibition/Switching ($r=-.32$, $p=.03$), self-reported FS Special Interests ($r=.39$, $p<.02$), parent-reported FS Transition/Change, FS Generativity, and BRIEF-2 Shift (all $r>.32$, $p<.05$), only in autistic youth. SwP also correlated with RBS-R across several RRB domains, but in opposite directions in autistic ($r>.31$, $p<.05$) and allistic ($r<-.43$, $p<.03$) youth.

RewP correlated with CWI_Inhibition/Switching and DF_Switching ($r<-.55$, $p<.04$), only in the allistic sample.

Conclusions: Our findings demonstrate that a novel CF task elicits distinct ERP indices of CF, such as SwP and RewP in both autistic and allistic youth. Interestingly, SwP and RewP were differentially associated with both lab-based EF tasks and everyday CF measures. In the autistic group, neural marker of set-shifting was related to everyday flexibility around transitions and special interests. Moreover, the differential correlations between SwP and RRBs in autistic versus allistic youth highlight unique brain-behavior relationship, affirming neurodiversity rather than deficit. In contrast, RewP related more strongly to CF task performance only in the allistic group, reflecting possible differences in the neural underpinnings of CF across groups. Overall, this study underscores the importance of multi-level analyses in understanding CF and its neural mechanisms, offering valuable insights into ways to support cognitive flexibility in neurodivergent individuals.

Panel Session

220 - Neural Mechanisms of Bottom-up and Top-Down Influences on Sensory Processing in Autism

May 3rd, 2025, 10:30 AM - 12:30 PM - 6C

Panel Chair: Shulamite Green, *Dept of Psychiatry and Biobehavioral Sciences, UCLA, Los Angeles, CA*

Discussant: Nicolaas Puts, *Forensic and Neurodevelopmental Sciences, Institute of Psychiatry, Psychology & Neuroscience, King's College London, London, United Kingdom*

Sensory differences in autism are increasingly recognized as a core feature of the condition, with profound impacts on everyday functioning. While the prevalence and impact of sensory differences in autism are well-established, the underlying mechanisms remain poorly understood. Many studies have focused on individual sensory domains in isolation (e.g., perception, reactivity, subjective measures), without considering how different aspects of sensory processing interact or relate to the complex, context-dependent, lived experiences of autistic individuals. Our panel integrates complex, multi-level, multi-modal approaches to explore how bottom-up differences in sensory encoding and perception interact with top-down differences in executive control to produce the sensory challenges seen in autism. We will also link these multi-level processes to real-world experiences to inform research approaches and potential interventions and support strategies. Dr. Levin will discuss how multi-level extrinsic factors interact with intrinsic brain states to affect sensory processing. Dr. Sapey-Triomphe will integrate behavioral and neural measures to examine associations between basic sensory detection and higher-level affective responsivity. Dr. Green will discuss how top-down processes play a key role in sensory regulation, and can inform varied interventions. Finally, Mrs. Douglas will explore community-relevant approaches to research that integrates understanding of lived experience.

Introduction

N. A. Puts, *Forensic and Neurodevelopmental Sciences, Institute of Psychiatry, Psychology & Neuroscience, King's College London, London, United Kingdom*

220.001 A Neurobiological Framework for Understanding Context Dependence in Sensory Processing

A. R. Levin¹, **Y. Braverman²**, **K. Dunham-Carr³**, **L. Jones⁴**, **D. Kranz⁵**, **R. Law⁶**, **C. MacKay²**, **R. M. Mankaryous⁶**, **K. A. McNair⁶**, **G. Parra⁶**, **S. R. Rogers⁶**, **C. Serianni⁶**, **M. Shao⁶**, **K. Szilagyi²** and **K. E. Takach⁷**, *(1)Neurology, Boston Children's Hospital / Harvard Medical School, Brookline, MA, (2)Neurology, Boston Children's Hospital, Brookline, MA, (3)Boston Children's Hospital / Harvard Medical, Boston, MA, (4)Boston Children's Hospital/Harvard University, Boston, MA, (5)Boston Children's Hospital/Harvard Medical School, Boston, MA, (6)Boston Children's Hospital, Boston, MA, (7)Laboratories of Cognitive Neuroscience, Boston Children's Hospital, Boston, MA*

Background: Cortical responses to sensory stimuli depend on the context in which these stimuli occur. Neurodevelopmental conditions such as autism provide a model for considering the neurobiology that supports translation of sensory stimuli into cortical responses and ultimately individual experiences. Electroencephalography (EEG) is a valuable tool for measuring these cortical responses.

Objectives: We propose a model for considering how top-down and bottom-up activity converge to influence context dependence of sensory responsivity. This context includes intrinsic “resting” brain activity, as well as extrinsic factors such as stimulus characteristics (e.g., salience), temporal context (e.g., habituation or facilitation), and spatial context (e.g., simultaneous background noise or distractors). We are developing and testing a series of EEG measures that allow objective assessment of how these factors impact sensory processing in young children with autism spectrum disorder (ASD), their typically developing (TD) counterparts, and a group of children who have sensory processing concerns (SPC) but do not meet criteria for ASD.

Methods: In an ongoing study, thus far we have collected data from children aged 3-4 years with ASD (n=51), SPC (n= 24) and TD (n=42). EEG data are collected at rest (i.e., when no time-locked stimuli are presented), and across multiple context-modulated sensory paradigms. For example, auditory stimuli include a loudness paradigm (tones presented across a range of loudness levels), habituation paradigm (repeated tones), and background noise paradigm (tones presented on top of background white noise). Resting data presented here reflect how often transient beta events occur over electrodes C3 and C4, measured using the Spectral Events Toolbox. Loudness response is measured by interpolated slope of the amplitude of the frontal N2 ERP response between 50 and 80dB. Habituation is measured using the amplitude of the P1 event-related potential. Background noise response is measured by the auditory middle latency response. Clinician observation of behavioral responses to sensory stimuli is measured by the Sensory Assessment of Neurodevelopmental Disorders (SAND), and parent observation is measured by the Sensory Profile 2 (SP2) and SAND.

Results: At rest, transient beta events occur more often in ASD than TD ($p = .02$). Children with ASD have a flattened input-output response curve to the loudness paradigm compared to TD ($p = .005$), but a steeper response curve at high levels of background noise. Habituation is reduced in ASD compared to TD ($p = .014$). Group comparisons with SPC are ongoing. On both the SP2 and SAND, across all diagnostic groups, sensory hyper- and hypo-reactivity are positively correlated (SP2 $r=0.83$, $p < 0.01$).

Conclusions: Our results objectively demonstrate atypical sensory processing in ASD compared to TD on EEG. The intrinsic and extrinsic context in which a sensory stimulus occurs can amplify sensory processing differences in autistic individuals. The proposed framework and associated EEG paradigms provide opportunities for back-translation into animal models (e.g., considering how various activities of inhibitory interneurons may impact context-dependent sensory processing) and forward translation into clinical trials (e.g., biomarker development and consideration of treatments targeting sensory discomfort).

220.002 A Multi-Level Investigation of Visual Sensitivity and Responsivity in Autistic Adults

L. A. Sapey-Triomphe¹, J. Dierckx², S. Vettori³, N. A. Puts⁴ and J. Wagemans³, (1)Lyon Neuroscience Research Center, France, Bron, FRANCE, (2)Department of Brain and Cognition, Leuven Brain Institute, KU Leuven, Leuven, Belgium, (3)Institut des Sciences Cognitives—Marc Jeannerod UMR5229, Centre National de la Recherche Scientifique (CNRS) & Université Claude Bernard Lyon 1, Bron, France, (4)Forensic and Neurodevelopmental Sciences, Institute of Psychiatry, Psychology & Neuroscience, King's College London, London, United Kingdom

Background: Atypical sensory processing is a core feature of autism spectrum disorder (ASD), yet measurements of sensory sensitivity in ASD often lack consistency. The terms *sensitivity* and *responsivity* are often used interchangeably, which may contribute to this inconsistency. Here, we define *sensory sensitivity* as the ability to detect a sensory stimulus, and *sensory responsivity* as the degree of discomfort experienced in response to sensory stimuli.

Objectives: We aimed to characterize visual sensitivity and responsivity in autistic adults across three levels: self-reported, behavioral, and neural. Additionally, we sought to explore how atypical sensory processing contributes to intolerance of uncertainty and anxiety. In a subset of participants, we also investigated molecular correlates of visual sensitivity.

Methods: Twenty-five neurotypical and 24 autistic adults, matched for age, gender ratio, and intelligence quotient, participated in this experiment. At the self-reported level, participants completed questionnaires assessing sensory sensitivity (Sensory Perception Quotient – SPQ), sensory responsivity (Sensory Over-Responsivity Scale – SOR), and both (Glasgow Sensory Questionnaire – GSQ). Behavioral tasks were designed to measure detection and responsivity thresholds for contrast and spatial frequency, using contrast-reversing gratings. At the neural level, we recorded electroencephalogram (EEG) signals while participants performed these tasks, using sweep visual evoked potentials to measure implicit detection thresholds. Participants also completed the short Intolerance of Uncertainty Scale and the State-Trait Anxiety Inventory. A subgroup of participants (N = 36, including 20 autistic adults) underwent magnetic resonance spectroscopy to measure Glx (i.e., glutamate and glutamine) and GABA concentrations in the occipital cortex.

Results: At the self-reported level, autistic participants scored higher than neurotypical participants on the GSQ and SOR ($p < .001$), with a marginal group difference on the SPQ visual items ($p = .057$). Behaviorally, no group differences were found in sensitivity or responsivity to contrast. However, the ASD group had significantly higher detection ($p < .01$) and responsivity ($p < .05$) thresholds for spatial frequency than the neurotypical group. Across participants, self-reported measures of sensory sensitivity and responsivity significantly correlated with behavioral measures of both domains. In the ASD group, but not in the neurotypical group, higher self-reported and behavioral sensitivity and responsivity were significantly associated with greater intolerance of uncertainty and anxiety. EEG measures revealed no significant group differences in detection thresholds for contrast or spatial frequency. In both groups, lower Glx/GABA ratios in the occipital cortex predicted lower contrast detection thresholds and higher spatial frequency detection thresholds, as measured by EEG.

Conclusions: In autistic adults, visual sensitivity and responsivity were elevated at the self-reported level, and typical or heightened (depending on the visual feature) at the behavioral level. Neural measures indicated typical sensitivity in ASD. In both autistic and neurotypical adults, lower Glx/GABA ratios in the occipital cortex allowed for better detection of visual inputs at the neural level. This multi-level approach provides new insights into sensory processing in ASD. These heterogeneous results suggest that sensitivity and responsivity per se are not simply increased in ASD, but may be modulated by other factors in daily life, such as predictability.

220.003 Neural Mechanisms of Sensory Regulation and Potential Interventions for Sensory over-Responsivity

S. A. Green¹, A. Than², U. Shah³, M. Dapretto¹, J. Silvers⁴ and M. Iacoboni³, (1)Dept of Psychiatry and Biobehavioral Sciences, UCLA, Los Angeles, CA, (2)Interdepartmental Neuroscience PhD Program, UCLA, Los Angeles, CA, (3)UCLA, Los Angeles, CA, (4)University of California, Los Angeles, Los Angeles, CA

Background: Over the past decade, we have made significant strides in understanding the brain bases of sensory over-responsivity (SOR) in autism spectrum disorders (ASD). Importantly, our prior work has identified that SOR is related to both increased reactivity to sensory stimuli in sensory cortices and limbic regions, as well as atypical top-down regulation of sensory inputs by the prefrontal cortex (e.g., Green et al., 2015; 2019). Importantly, extent of prefrontal engagement during aversive sensory stimulation may explain individual differences in SOR in ASD (Green et al., 2019), as well as age-related improvements in SOR (Cakar et al., 2023). Taken together, these studies suggest that interventions that engage top-down, prefrontal regulatory systems could improve sensory hyper-reactivity and related challenges. Here, I will present data demonstrating the effect of 1) a behavioral and 2) a neuromodulation intervention on engaging prefrontal cortex and reducing neural over-reactivity to sensory information across ages.

Objectives: Test the effect of sensory regulation interventions on neural reactivity to aversive sensory stimuli, including 1) an emotion regulation strategy (reappraisal), in 8-15 year-olds; and 2) transcranial magnetic stimulation (TMS) to the dorsolateral prefrontal cortex (dlPFC) in autistic adults.

Methods: Study 1: Participants were 33 ASD and 28 TD youth, aged 8-17 years. During fMRI, participants were exposed to scratchy tactile stimuli rubbed on their inner wrist, and were instructed to think about how the stimuli made them feel ("Feel" condition) or use a reappraisal strategy of thinking about how they would describe the material objectively ("Reporter" condition). Study 2: Participants were 25 adults with ASD aged 18-30 years, who met criteria for SOR on the Sensory Processing 3-Dimensions self-report questionnaire. Participants completed a baseline fMRI and then 1 month later received excitatory TMS (intermittent theta-burst stimulation; iTBS) to their left dlPFC and immediately thereafter completed the same fMRI paradigm. During fMRI, participants were presented with 6 15-sec blocks each of alternating mildly aversive auditory+tactile (white noise and scratchy sponge) and visual+tactile (flashing checkerboard and scratchy sponge). fMRI data was thresholded at $Z > 2.3$, $p < .05$.

Results: In study 1, both ASD and TD youth showed increases in medial prefrontal cortex in the Reporter compared to Feel condition, suggesting that the reappraisal strategy was successful in engaging prefrontal cortex for all participants. The ASD but not TD youth further showed significant decreases in primary auditory, visual, and tactile cortices in the Reporter compared to Feel condition. In Study 2, participants showed decreases in relevant sensory cortices (sensorimotor and auditory in tactile+auditory condition; sensorimotor and visual in tactile+visual condition) after iTBS compared to at baseline.

Conclusions: Both reappraisal, a behavioral intervention, and TMS, a neuromodulatory intervention, appeared successful at engaging prefrontal cortex and reducing neural sensory hyper-activity across children, adolescents, and young adults with ASD. Taken together, these results are consistent with the hypothesis that top-down processes are important to regulating sensory reactivity. Results will be discussed in terms of the potential for top-down, sensory regulation interventions to provide support for autistic individuals of varied ages and needs.



220.004 Lived Experience of Autistic Sensory Differences

S. Douglas¹, F. Sedgewick² and N. A. Puts³, (1)Bristol, United Kingdom, (2)University of Bristol, Bristol, NA, United Kingdom, (3)Forensic and Neurodevelopmental Sciences, Institute of Psychiatry, Psychology & Neuroscience, King's College London, London, United Kingdom

Background:

I am a neurodivergent late diagnosed AuDHD, white, cis, woman. Since my autism dx, I have engaged with the process becoming an autism and neurodivergent research study advisor. As honorary research advisor at Bristol University, an A-Rep on AIMS-2-TRIALS, I use my lived experience in the context of participatory projects and study design (LEANS, STRATA, AASP, VAMHNs). My focus lies on creating a positive impact of participatory research encouraging bridge-building, attitudinal shifts and creates cultural research environments that support and enhance the wellbeing of the research team, the participants and consequently the quality of data collected.

However, we are still a long way from focusing on the priorities of the autistic community that want research that focusses on enhancing our day-to-day wellbeing. Stereotypical and stigmatizing attitudes that monolithically paint autistic people as cold, unempathic loners are both wildly inaccurate and damaging when the reality is that many autistic people thrive when they have the experience of authentic, reciprocal and nurturing relationships in their lives. One of the primary barriers for autistic people to achieve this are sensory challenges. Sensory processing and friendships /relationships both scored highly in the 2024 Stirling survey – the first fully autistic community-based research priority-setting exercise, and it is the interrelationship of these two areas that will be highlighted.

Objectives:

To 1) combine my lived experience of navigating relationships as an autistic person who has numerous sensory challenges, with material from my co-authored accessible academic publication *Understanding Autistic Relationships Across the Lifespan: Family, Friends, Lovers and Others* and 2) Discuss how my conversations with (autistic) researchers have led to co-produced experimental designs to better understand the impact of bottom-up and top-down markers of sensory difficulties.

Methods:

Using qualitative methods, 24 contributors were interviewed and thematically coded within chronological chapters that wove their and my experiences together with existing peer-reviewed research, with an emphasis on the sensory challenges from daily life, merging experimental and lived-experience research. Further, through conversations with autism researchers that I have developed mutually supportive relationships within the AIMS-2-TRIALS Consortium we developed novel, applicable, measures of sensory perception and sensory affections, and aversions (psychophysical and cognitive tasks).

Results:

Thematic findings show that authentic, reciprocal and nurturing relationships are key to autistic thriving, but there are many barriers, including the dynamism of sensory processing differences, to achieving this. The dynamic nature of sensory difference stands out as not currently being addressed by research. Co-production with the autistic community can enhance researchers' understanding of sensory differences. Following consultation, sensory measures were incorporated into the AIMS-2-TRIALS consortium focusing on relevant measures for autistic people (e.g., the ability to filter out sounds in noisy environments). Preliminary findings align with the autistic experience that sensory aversions are highly context-dependent more accurately reflecting the nuanced nature of autistic sensory experiences.

Conclusions:

Understanding the mechanics of autistic sensory processing differences, translating this knowledge into transforming the sensory and relational environment, whilst respecting autistic social and communication culture, will enhance the wellbeing of the autistic community.

Panel Session**221 - Innovations in Training Community Mental Health Providers to Serve Autistic Individuals**

May 3rd, 2025, 10:30 AM - 12:30 PM - 6A

Panel Chair: Allison Nahmias, *AJ Drexel Autism Institute, Drexel University, Philadelphia, PA***Discussant:** Amy Drahota, *Department of Psychology, Michigan State University, Department of Psychology, East Lansing, MI*

Autistic children and adults are more likely than their non-autistic counterparts to have at least one co-occurring mental health diagnosis (Longo et al., 2024; Underwood et al., 2023; Rast et al., 2021). Despite this heightened need for mental health services, autistic individuals report significant difficulty accessing appropriate care, citing practitioners' lack of autism knowledge and inability to adapt modalities for autistic clients (Maddox et al., 2020; Brede et al., 2022; Chiri & Warfield, 2012; Brookman-Frazee et al., 2012). Clinicians highlight a lack of autism-specific training as a key barrier (Ainsworth et al., 2020 and Adams & Young, 2020). Therefore, innovations in community mental health provider training are warranted to increase community capacity to adequately serve the mental health needs of autistic individuals. This symposium will cover four unique models for training community mental health clinicians that vary in their training focus and methods. Outcomes discussed will include changes in putative implementation mechanisms (e.g., provider confidence, presentations 1, 2, and 4) and implementation outcomes (e.g., fidelity, presentations 3 and 4). A senior scholar with expertise in autism mental health services and implementation science will provide an integrative discussion, with a focus on future directions in dissemination, implementation, and service system integration.

Introduction**A. S. Nahmias**, *Psychiatry and Behavioral Sciences, A.J. Drexel Autism Institute, Drexel University, Sacramento, CA***221.001** Extension for Community Healthcare Outcomes As a Model to Increase Mental Health Support for People with Intellectual and Developmental Disabilities**S. Iadarola¹**, **B. Cavanaugh¹**, **C. M. Perez²** and **S. Hochheimer¹**, *(1)University of Rochester Medical Center, Rochester, NY, (2)Developmental and Behavioral Pediatrics, University of Rochester Medical Center, Rochester, NY*

Background: People with intellectual and developmental disabilities (IDD) experience higher rates of mental health distress and risk of self-harm as compared to the general population. Systemic issues within our medical and mental health systems, however, contribute to health inequities for people with IDD. Mental health providers often report feeling unequipped and untrained to welcome people with disabilities into their practices, especially those who do not use fluent spoken language. This is compounded by the already restricted workforce in mental health spaces. Many adults with disabilities experience challenges navigating these complex systems or may have access issues based upon insurance status, location, or transportation. In the context of these barriers, provider education is highlighted as a facilitator of mental healthcare access in the disability population (Whittle et al., 2018). The Extension for Community Healthcare Outcomes (ECHO) model is a promising approach to providing specialty education to community providers. ECHO utilizes subspecialty, interdisciplinary expertise at an institutional "Hub" to engaged community provider "spokes" in a structured and facilitated virtual learning network, through didactics and case presentation discussions. **Objectives:** Evaluate the preliminary efficacy of an ECHO for Mental Health and IDD on the ability of community mental healthcare providers to feel confidence and competence in welcoming disabled patients into their practices.

Methods: We conducted four ECHO cohorts of 10-20 participants across three years. Participants represented community mental health providers including psychologists, licensed mental health counselors, school psychologists, behavior analysts, crisis counselors, and social workers. Each ECHO cohort met either once per week or every other week (depending upon cohort schedules) for 8-10 sessions. Sessions included 1) "spoke" case presentations that were discussed by the full group and 2) "hub" didactic presentations on relevant topics (e.g., risk assessment in IDD, adapting therapy for people with limited spoken language). Participants completed a pre and post-assessments evaluating 1) perceptions of clinical comfort working with the IDD population and 2) disability-related attitudes in mental health care.

Results: 110 participants registered and completed the pre-assessment measures. Approximately 50 participants participated in ECHO, and of these 25 completed the post measures. Pre-ECHO means were 23.09 for Clinical Comfort, as compared to 25.61 post-ECHO, representing a statistically significant increase in perceived comfort working with patients with disabilities ($p=.005$). Pre-ECHO mean was 15 for Disability Attitudes, compared to 16.12 post-ECHO, also representing a statistically significant increase in positive disability attitudes ($p=.03$).

Conclusions: IDD-focused ECHO is a promising strategy to increase the comfort and disability attitudes of community-based mental health providers. Widespread training may help more disabled people with co-occurring IDD received mental health care in the community, as opposed to seeking subspecialty care, which is accompanied by many access barriers. Replication with larger samples is needed, particularly as the pre/post samples were unbalanced. Ongoing IDD and Mental Health ECHO is occurring to provide future data in this area.

**221.002** Evaluating an Online Training Series to Increase Confidence and Competence of Community Mental Health Providers to Use Cognitive Behavioral Therapy Strategies to Treat Autistic Youth and Youth with ID**A. S. Nahmias¹**, **K. Merritt-Gawe¹**, **K. M. Hricak¹**, **B. Jeyanayagam²**, **A. Smith³**, **L. Moskowitz²**, **D. L. Gassner⁴**, **R. Sachs⁴** and **M. D. Lerner¹**, *(1)AJ Drexel Autism Institute, Drexel University, Philadelphia, PA, (2)Department of Psychology, St. John's University, Queens, NY, (3)Department of Psychology, St. John's University, Queens, NY, (4)Spectrum Services, New York, NY*

Background: Despite the increased risk for experiencing mental health disorders and poor mental health outcomes (Rosen et al., 2018), autistic youth are often unable to access *any* mental health treatment, especially evidence-based interventions such as cognitive behavioral therapy (CBT; Adams & Young, 2021). In fact, access to quality mental health care is one of the largest unmet service needs for autistic youth, due in part to the lack of appropriately trained providers (Chiri & Warfield, 2012). Moreover, when care is available, it often neglects crucial lived-experience insights desired by the autistic community to increase relevance, accessibility, and acceptability (Roche et al., 2021; Maddox et al., 2021). The Scalable Psychopathology InteRvention Intensive Training for ID & Autism (SPIRIT) was developed to meet this need, utilizing asynchronous and synchronous online instruction to incorporate neurodiversity-affirming approaches and autistic lived-experience perspectives with training in core CBT skills and evidence-based adaptations for autistic youth and youth with intellectual disabilities (ID). It includes a 6-session Basic instructional series (max n/group = 40), followed by an available Advanced small group case consultation series (once/month for 4 months, max n/group 8), enabling readily scalable and accessible delivery.

Objectives: To assess provider outcomes from participants in the SPIRIT training program.

Methods: Community mental health providers working in state-funded office of mental health settings were invited to enroll in SPIRIT.

Questionnaires were administered to participants pre- and post- Basic training and once a month during (and one month after) SPIRIT Advanced. T-tests were used to compare provider confidence and competence ratings pre- and post- Basic training. Mixed-effects modeling was used to assess SPIRIT Advanced participant-reported frequency and perceived effectiveness of their use of 23 CBT strategies over time. All p-values were Bonferroni-adjusted.

Results: 210 community mental health providers (57.1% social workers, 32% without any prior experience with autism) began SPIRIT Basic training across 6 cohorts, and 40 (22.5% without any prior experience with autism) continued onto SPIRIT Advanced. 69.5% of Basic and 75% of Advanced trainees completed all training activities. Basic participants reported significant improvements in their confidence and competence to treat mental health problems in autistic youth and in youth with ID from pre-to-post training (all $p < .02$). Advanced participants reported significant improvements over time in *both* their frequency and effectiveness for 2 core CBT (e.g., cognitive restructuring, Figure 1) and 4 autism-specific (e.g., visual supports, Figure 2) strategies (p -values $< .02$). They also rated the training as highly acceptable ($M = 4.8$ out of 5) and highly likely to make permanent improvements in their ability to implement, modify, and adapt CBT with autistic youth and/or youth with ID ($M = 4.7$ out of 5).

Conclusions: The SPIRIT training series is a promising, accessible model for increasing the confidence and competence of community mental health providers to use CBT techniques to treat autistic youth and youth with ID. Future research should assess the degree to which provider-reported changes translate to improved access to care and therapeutic outcomes for this population, and utilize experimental designs to compare training models.



221.003 Impact of Internet-Based Self-Directed Training in CBT for Autistic Youth on Clinician's Ratings of Intervention Adherence

J. Wood¹ and **B. McLeod²**, (1)Human Development & Psychology, University of California Los Angeles, Los Angeles, CA, (2)Virginia Commonwealth University, Richmond, VA

Background: Modular EBPs for Youth on the Autism Spectrum (MEYA; meya.ucla.edu) is a free internet-based clinician training and guidance system developed from existing EBPs for autistic youth (e.g., Wood et al., 2020, 2021) distilled into modules that address autism-related clinical needs (e.g., friendship skills) along with concurrent mental health needs (e.g., anxiety; disruptive behavior). Training is provided in brief internet-based self-instruction modules that are pushed out to clinicians just days before an upcoming session. The overarching objective of MEYA is to help community clinicians develop expertise in EBPs by increasing their adherence to specific CBT techniques that are applicable to the highest priority clinical needs of the children and youth they are working with.

Objectives: A multiple baseline study of seven clinicians (e.g., psychologists, MFTs) recruited from several community care settings throughout the United States was conducted to determine if internet-based self-directed training would facilitate an increase in clinician adherence to CBT techniques addressed in MEYA.

Methods: Clinicians were asked to invite a new autistic youth client (aged 6 to 17 years; 3 girls, 4 boys; 5 Caucasian, 2 Latino) and their family to participate in the study as well; once a client (and her/his caregiver) consented/assented, clinicians were randomly assigned to undergo baseline conditions of 2 to 8 weeks in length. During baseline, clinicians used their typical intervention practices. Once online MEYA training commenced, clinicians engaged in algorithm-guided self-instruction in CBT for autistic youth. Participating clinicians videotaped each session (baseline and MEYA) and made self-ratings on an adherence rating scale: the MEYA Fidelity Scale-Clinician Version. The average number of MEYA sessions completed was 11. Trained coders unaware of session number or study hypotheses also used the MEYA Fidelity Scale-Rater Version to rate the therapists' adherence to MEYA practices for each session.

Results: Visual analysis of multiple baseline charts showed that most clinicians significantly increased their self-reported adherence in CBT practices (i.e., MEYA-FS-CV scores) immediately or soon after the end of baseline and beginning of MEYA training. This increase in fidelity was maintained across most subsequent MEYA sessions for these therapists. Multilevel linear models (with sessions nested within therapists) suggested that clinician self-ratings were significantly associated with observer ratings on the MEYA-FS items.

Conclusions: MEYA is a promising free training tool that may help therapists improve their adherence in CBT practices for autistic children and youth. Self-ratings of adherence appeared to be a meaningful tool for examining fidelity to such practices.

221.004 The Impact of Training Community Mental Health Therapists in an Adapted Executive Function Intervention for Autism

K. S. Dickson¹, **T. Holt²**, **L. Anthony³**, **L. Kenworthy⁴** and **L. Brookman-Frazee⁵**, (1)San Diego State University, San Diego, CA, (2)SDSU, San Diego, CA, (3)University of Colorado, Denver, Aurora, CO, (4)Center for Autism Spectrum Disorders, Children's National Hospital, Washington, DC, (5)Psychiatry, University of California, San Diego, La Jolla, CA

Background: As detailed by Maddox and colleagues (2021), there have been significant advances in the understanding of mental health needs and mental health services for autistic individuals, including enhanced understanding of the range of co-occurring mental health conditions experienced and a growing evidence-base for mental health interventions for autism. Yet major barriers to quality mental health services for autistic individuals remain, including limited community mental health workforce capacity to effectively serve autistic individuals. Mental health therapists commonly have limited training, experience and confidence working with autistic individuals, contributing to more limited intentions to use evidence-based interventions with this population (Maddox et al., 2021). Together, this highlights the need for effective autism-focused training models to enhance mental health therapist capacity to work effectively with autistic individuals.

Objectives: The current mixed-methods study examines the impact of training therapists in a clinical intervention training model developed as part of a systematic adaptation of an evidence-based executive function intervention entitled *Unstuck and On Target (Unstuck)* for implementation in community mental health settings.

Methods: As part of our systematic, community-partnered adaptation of *Unstuck* for delivery in community mental health settings, we developed a therapist training model based informed by best-practice methods for effective therapist training (Frank et al., 2020) and existing models shown to promote effective strategy delivery among community providers, including the *Unstuck* (Anthony et al., 2023; Kenworthy et al., 2014) and *AIM HI* (Brookman-Frazee et al., 2019, 2022) training models. As part of a randomized feasibility pilot trial of the adapted version of *Unstuck*, therapists (N=13, 88% female, 38% Hispanic/Latinx, 81% master's level clinician's) received training and delivered *Unstuck* with participating autistic clients (N=20, 60% male, $M_{age}=9.43$, 80% Hispanic/Latino/a). We examined therapist training outcomes, including: therapist training completion, observed therapist *Unstuck* strategy use (fidelity) with participating clients, and therapist-reported changes in knowledge and confidence in addressing executive functioning in their clients. We also gathered therapist perspectives on our training model via corresponding qualitative interviews.

Results: The majority of therapists (92%) successfully completed training and delivered 75% or more of the intervention to participating clients during study participation. Additionally, therapists demonstrated strong use of *Unstuck* strategies ($M [SD] = 4.30 [.51]$ on a 1-5 scale) during delivery with participating autistic clients. Therapists reported significant improvements in knowledge and confidence (Cohen's d effect size range = .44-.84) addressing executive functioning following training. Expanding on this, qualitative themes indicated therapists perceived the feasibility and utility of the training model, particularly in supporting their confidence working with autistic youth.

Conclusions: Our therapist training model was effective in promoting therapist knowledge, confidence, and effective delivery of *Unstuck*. Qualitative themes further underscore the utility and feasibility of this training model for community settings. A strength of the current study is the evaluation of our training model as part of delivery with participating autistic clients. Findings add to the growing literature regarding effective methods to train mental health therapists to effectively work with autistic youth.

Panel Session

222 - Unpacking Social Communication: Conceptualization, Measurement, and Application across the Translational Spectrum

May 3rd, 2025, 10:30 AM - 12:30 PM - 611-614

Panel Chair: Emily Neuhaus, *Department of Psychiatry and Behavioral Sciences, University of Washington, Seattle, WA*

Discussant: Raphael Bernier, *Psychiatry and Behavioral Sciences, University of Washington, Seattle, WA*

Social communication differences represent an influential core diagnostic and theoretical component of autism, but the construct also reflects a broad category of behaviors and abilities that has been inconsistently defined and measured. In this panel, we unpack the construct of social communication to consider novel and nuanced approaches to its assessment, explore applications for support and interventions, examine associations with neural functioning, and consider its utility in understanding genetic influence in neurodevelopment. Speakers will present novel research exploring (1) the development of a change-sensitive tool to capture social communication abilities across development, (2) relationships between social dimensions across measures and over the course of developmentally appropriate intervention, (3) brain-behavior associations during innovative, real-time, ecologically valid dyadic EEG collection, and (4) exploration of social communication alone and in conjunction with other phenotypic features to enhance genetic understanding relevant to autism. As a whole, this panel presents a translational perspective to social communication that bridges implementation of clinically meaningful tools all the way to neural and genetic underpinnings.

Introduction

E. Neuhaus, *Department of Psychiatry and Behavioral Sciences, University of Washington, Seattle, WA*

222.001 Toward a Change-Sensitive Measure of Social Communication: The Developmental Assessment of Social Communication Ability (DASCA)

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Background: Although scientists have long been interested in understanding the typical development of social communication behaviors like joint attention and their foundational importance for language and cognition, in clinical psychology and psychiatry, social communication is most often discussed in diagnostic terms related to autism spectrum disorder (ASD). Thus, social communication tends to be viewed and measured in binary terms (i.e., presence vs. absence of deficit), rather than as a dimension of abilities that evolve over time. Because of the overwhelming focus on evaluating deficits, available measures of social communication are not responsive indices of severity. This hinders meaningful comparisons of social communication ability within or between diagnostic groups, as well as measurement of within-person change in response to treatment.

Objectives: The Developmental Assessment of Social Communication Ability (DASCA) was developed as a clinical outcome measure appropriate for monitoring and longitudinal assessment of change in children with neurodevelopmental disorders.

Methods: Qualitative components of our measure development approach included focus groups and cognitive debriefing interviews. Quantitative components included dimensionality analysis, differential item functioning, and item response theory modeling. The item bank was iteratively refined and field tested with nearly 6000 parents of children under 18 years (approximately 30% were diagnosed with autism or another neurodevelopmental disorder), recruited from several large registries, including OP4G (a market research firm that recruits parents of children unselected for any specific developmental disability), SPARK, and Simons Searchlight.

Results: The final DASCA item bank contains 284 items focused on social communication skills that are typically acquired by early- to middle-childhood. Expressive language was a major factor in determining the appropriateness of some items for different groups of children. Negligible differential item functioning, primarily by age, was observed for some items. However, impact analyses determined that this differential item functioning did not meaningfully impact scores at the test level. Unexpectedly, despite multiple attempts to group items into different “types” of social communication behaviors (e.g., based on form or purpose of initiation or response), models incorporating multiple social communication factors or attributes did not substantially improve the statistical model fit for these data. Thus, we hypothesize that social communication may mirror other domains of development where skills that appear to represent different categories emerge nearly simultaneously (e.g., for expressive language development, young children begin using verbs shortly after first nouns are acquired).

Conclusions: The DASCA item bank represents a significant advancement in measuring caregiver-reported social communication in children with NDDs. Unlike currently available measures, it focuses on the presence of developmentally expected social communication skills rather than lack thereof, potentially allowing for a more responsive measurement of social communication. Ongoing development efforts include creating a computer adaptive test administration to allow for serial assessments using different item sets on a consistent score metric that is sensitive to change.

222.002 Refining Social Communication Domains in Autism: From Better Characterization to Targeted Precision Interventions

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Background: Social functioning difficulties represent a core diagnostic feature of autism spectrum disorder (ASD) that is complex and multifaceted. Individuals diagnosed with ASD show pronounced heterogeneity with respect to presentation, severity, and the course of specific facets of social functioning. Unfortunately, the majority of widely used scales have poor coverage and representation of distinct constructs of this complex symptom domain. To address this significant limitation, the Stanford Social Dimensions Scale (SSDS) was developed following gold-standard measurement development principles—that span systematic review of the literature and factor analyses of existing instruments, including the Social Responsiveness Scale (SRS-2)—in order to comprehensively characterize fine-grained, biologically-based Research Domain Criteria (RDoC) social constructs and subconstructs: Social Communication (SC), Attachment/Affiliation (AA), and Understanding Mental States (UMS).

Objectives: To better characterize the social functioning profile of children with ASD using novel approaches and examine the usefulness of these strategies in clinical trials.

Methods: Cross-sectional data from a well-characterized sample of 40 children with ASD from an ongoing study were examined to characterize associations between social subdomains captured by the SSDS subscales (social motivation [SM], social affiliation [SA], Expressive Social Communication [ESC], and Social Recognition [SR]) aligning with specific RDoC AA, SC and UMS domains of functioning, and clinical features such as language abilities as measured by the MacArthur-Bates Child Development Inventory (CDI) and restricted repetitive behaviors (RRB) as assessed with the Repetitive Behavior Scale-Revised (RBS-R). Data from a completed trial involving a Developmental Reciprocity Treatment package (DRT-P), a developmentally based intervention, that reported SC benefits will also be examined to identify the subdomains driving the overall improvements.

Results: SM and SA subdomains showed strongest associations with total number of CDI gestures ($R=0.507$, $p<0.001$ and $R=0.529$, $p<0.001$, respectively). Number of words understood from the CDI showed the strongest association with SA ($R=0.321$, $p=0.43$) and SR ($R=0.382$, $p=0.015$). Interestingly, no associations were observed between CDI words produced score and the SSDS social subdomains. Higher levels of RRB were associated with higher difficulties in SM ($R=0.428$, $p=0.013$) and ESC ($R=0.609$, $p<0.001$) subdomains. Regarding the trial, participants in DRT-P showed improvement on the SRS ($F=5.00$; $p=0.034$) with improvement observed in the SC ($F=4.93$; $p=0.035$) but not in the AA and UMS subdomains. Similar analyses will be conducted on data being collected in an ongoing trial in preschoolers with ASD participating in a center-based pivotal response treatment program.

Conclusions: Preliminary findings from the analyses reported here point to the value of examining different social domains in order to increase our understanding of the clinical profile of children with ASD and to further assess the different areas that are benefiting from when receiving a specific intervention. Further research using similar approaches is needed to examine large samples of children and adults with ASD participating in clinical trials, so that additional insights can be gained in the specific domains benefiting from specific treatments.

222.003 Advancing Towards Dyadic, Interactive Neural Measures of Social Perception

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Background: Social motion perception may reflect the mechanisms by which low-level social communication processes are impacted in autism (Federici et al., 2020; Todorova et al., 2019). Recent studies have utilized biological motion perception as a target of social skills training (Yang et al., 2017) and biomarker development (McPartland et al., 2020; Webb et al., 2020). However, our knowledge of the neural mechanisms of social perception in autism is largely limited to traditional, screen-based research. Because social interactions are naturally dynamic and occur between people, there is an urgent need to examine these processes in an ecologically valid way.

Objectives: Our primary objective is twofold: (1) to evaluate how correlates of social perception vary based upon task (traditional vs interactive) and contingency (real-time vs. pre-recorded) in autistic adolescents; (2) to evaluate how interactive perception relates to individual differences in social communication and social behaviors.

Methods: Participants included autistic and non-autistic adolescents (N=12, aged 10-17 years old) that completed a dyadic electroencephalography (EEG) session with a close friend or stranger. Here, we evaluate neural correlates on two tasks where participants were asked to sit quietly and watch the screen: (1), a traditional motion perception task (Hudac et al., 2015; 2017) with minute-long videos of social motion (person dancing, hands clapping) or nonsocial motion (ball bouncing, tubes swinging); and (2) videos of the participant (Self) or their dyad partner (Other) during real-time (Contingent) or prerecorded (Noncontingent) interactions. We targeted frontal alpha asymmetry (FAA), as it is linked to social communication abilities in autism (Neuhaus et al., 2023). Participants completed a battery of self-report social communication and social behavior measures, including the Conversation Questionnaire (Wilson, 2022), Need to Belong Scale (Leary et al., 2013), and a social connection and loneliness survey (Card & Skakoon-Sparling, 2023).

Results: During the interactive task, FAA did not vary based upon real-time versus pre-recorded conditions, $p = .37$, or relate to autism diagnosis, $p = .85$. As shown in Figure 1, preliminary analyses using Spearman correlations indicated that increased positive FAA ("approach") during interactive motion perception was associated with a trend for increased positive FAA during traditional Biological but not traditional Non-Biological motion. Lastly, interactive FAA values were positively associated with confidence regarding conversation skills ($r = .56$, $p = .039$).

Conclusions: As cognitive neuroscience techniques become more advanced, it is increasingly important to ensure and evaluate the ecological validity of traditional measures and utilize more engaging interactive tasks. Our results indicate that FAA may be a viable biomarker across traditional non-interactive and interactive (e.g., hyperscanning) settings. Importantly, interactive FAA is also associated with autistic self-perception of social communication skills.



222.004 Leveraging Social Motivation to Understand Genetic Influence in Autism

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Background: Identification of genetic influences that increase likelihood of autism (ASD) offers tremendous potential to uncover neurobiological mechanisms, delineate genetically-defined subgroups, and enable individualized intervention based on unique etiology. However, large-scale genomic efforts to distinguish genes contributing primarily to ASD (ASDpredominant) versus those contributing to broader neurodevelopmental conditions that may include ASD along with multisystem impairment (e.g., seizures, cardiac concerns) (NDDpredominant) have yielded inconsistent conclusions. This has been attributed to both methodological factors and heterogeneity in phenotype. We suggest that although this heterogeneity poses difficulties for genetic approaches relying on dichotomous classification (presence vs absence of ASD), it represents meaningful variability that has yet to be fully leveraged to understand genetic influences on neurodevelopment. We propose that inclusion of quantitative social phenotypes can aid in these efforts, and "boost the signal" of genomic efforts to understand ASD etiology.

Objectives: We sought to (1) examine social phenotypes across groups with variants in genes hypothesized to associate with ASD versus broader neurodevelopmental conditions, and (2) test the ability of social phenotype alone and in conjunction with medical history and intellectual disability (ID) to distinguish genetically-defined subgroups.

Methods: Phenotypic and genomic data from the Simons Searchlight single-gene cohorts were coded according to ASD specificity as categorized by Satterstrom and colleagues (2020), yielding 32 individuals with variants in "ASDpredominant" genes and 344 with variants in broader "NDD predominant" genes (Fig. 1). General linear models were constructed to compare profiles of social-communication features across the groups, using SRS-2 subscales (Constantino, 2012). Medical history data were extracted and coded for presence of ID, and an index of medical complexity was computed across 12 somatic systems. Logistic regression models were computed to compare the ability of (1) social phenotypes, (2) intellectual disability, and (3) medical complexity, in differentiating between Satterstrom classifications.

Results: Social phenotypes (Fig. 1) differed according to gene group membership, $F(1,2.5)=3.84$, $p=.01$, driven by greater difficulties in social motivation, $p<.001$, and social cognition, $p=.03$, in the ASDpredominant group. While the groups did not differ in likelihood of ID, $\chi^2(1)=2.13$, $p=.14$, the NDDpredominant group had greater medical complexity, $F(1,374)=6.14$, $p=.01$, consistent with broader neurodevelopmental impairment. The logistic regression model containing social phenotypes, ID, and medical complexity was significant, $\chi^2(8)=20.23$, $p=.009$, Nagelkerke $R^2=.14$, and correctly classified 92.2% of cases. Social motivation was the single strongest predictor, $p=.02$, along with medical complexity, $p=.038$, and (marginally) intellectual disability, $p=.079$. Membership in the ASDpredominant gene subgroup corresponded to greater social motivation difficulties, lesser medical complexity, and marginally lower likelihood of ID.

Conclusions: Examination of quantitative social phenotypes, rather than solely dichotomous ASD diagnosis, may uncover information important to understanding genetic influence, especially when considered in conjunction with medical complexity. Social motivation may be a particularly impactful construct in untangling genetic influence, as it uniquely differentiated between subgroups in the current data, tracks with familial history of autism (Marrus et al., 2022), has meaningful variability among individuals on the autism spectrum (Neuhaus et al., 2020), and has long been foundational to etiological theories of neurobiology underpinning autism (Dawson et al., 2005).



Panel Session

223 - Neurodivergence-Affirming and Inclusive Research Practices for Autistic People with High Support Needs

Panel Chairs: Steven Kapp, *School of Psychology, Sport and Health Sciences, University of Portsmouth, Portsmouth, Hampshire, United Kingdom*

Diana Tan, *Macquarie School of Education, Macquarie University, Sydney, NSW, Australia*

Vikram Jaswal, *Psychology, University of Virginia, Charlottesville, VA*

Discussant: Grant Blasko, *self-advocate/ community participatory researcher, Seattle, WA*

Introduction

D. W. Tan, *Macquarie School of Education, Macquarie University, Sydney, NSW, Australia*

223.001 “It's OK to Have Brain Fails”: The Views of Autistic Adults, Including Those with High Support Needs, on Co-Governing the Autism from Menstruation to Menopause Study

A. Grant, *Swansea University, Swansea, Wales, United Kingdom*

Background:

Research on Autistic adults often neglects those with High Support Needs (HSN). However, the neurodiversity paradigm provides a clear justification to not limit Autism research in this way. Moreover, whilst community involvement in Autism research has grown, this involvement has sometimes been described as both tokenistic and superficial. The Autism from Menstruation to Menopause study uses Community Based Participatory Research (CBPR), principles to meaningfully share power as co-researchers, aligned with the neurodiversity-affirming AASPIRE guidelines for participatory research (Nicolaidis et al., 2019; Raymaker, 2020). This included co-developing the grant application and accessible recruitment practices to establish a Community Council, including those with HSN.

Objectives: To describe (i) the approaches used to make the Autism from Menstruation to Menopause Community Council accessible, and (ii) what the Community Council, including Autistic members with HSN, think about it.

Methods:

Twelve Autistic people (including four with HSN; three with intellectual disabilities and one without intellectual disabilities but who is non-speaking and has high care needs) were recruited to a Community Council in ways that prioritised inclusivity. To ensure accessibility, 1-1 conversations about access needs were held when members joined and again a year later. Nine meetings were held to help develop the Autism from Menstruation to Menopause study, and to jointly plan the evaluation of the Council. Accessibility was prioritised in these meetings, for example: providing 1-1 meetings ahead of Council meetings, having reminders focused on inclusivity and a learning culture, paying for or providing 1-1 support workers, and completing payment paperwork for members. In July 2024, all Council members undertook a semi-structured interview or completed a qualitative survey to provide feedback on their experiences of being part of the Council.

Results: After a year, the Council retained 11 members, three with HSN. Council members, including those with HSN, were overwhelmingly positive about their experience taking part in the Council. In particular, Council members with HSN felt their needs were generally met well. Nevertheless, some additional access needs were identified and subsequently implemented (e.g. creating an “easy read” agenda for meetings, using photos alongside words). In addition, Council members with lower support needs valued the accessibility accommodations implemented for those with higher support needs, as these measures made participation more accessible for everyone, including themselves.

Conclusions: All Autism research - and researchers - can benefit from involving the Autistic community, and this should include Autistic people with HSN. Moreover, from a place of social and epistemic justice, research should be done *with* communities. Embedding a neurodiversity-affirming approach throughout our Community Council has resulted in greater accessibility to all members with varying levels of support needs. This has informed our study design and participant-facing materials for the Autism from Menstruation to Menopause study, which has successfully recruited Autistic participants with HSN (10 intellectual disability; 13 semi-speaking). When developing grant applications for autism research studies, sufficient time and funding should be included to allow all aspects of the research process to be informed by the lived experiences of those with HSN.

223.002 Community-Based Participatory Research with Autistic Youth and Adults with Language Impairment

T. M. Girolamo, *School of Speech, Language, & Hearing Sciences, San Diego State University, San Diego, CA*

Background: Community-based participatory research (CBPR) are rare and tend to exclude autistic people with high support needs (HSN), including those with structural language impairment (Chen et al., 2024). Structural language impairment commonly co-occurs in autism and is tied to worse communication outcomes (Boucher, 2012; Johnson et al., 2010). Thus, even with growing attention to CBPR (Fletcher-Watson et al., 2019), it is unclear how researchers could partner with autistic people with different support needs. This study focuses on CBPR with autistic participants who have structural language impairment and diverse nonverbal cognitive abilities.

Objectives:

1. To determine how to enhance the CBPR environment for a study on self-determination in autistic adolescents and adults with structural language impairment;
2. To identify how clinical assessment related to the personal goals of autistic adolescents and adults.

Methods:

To address the first aim, we identified strategies to tailor a self-determination measure for autistic adolescents and adults with structural language impairment and created a novel interview support structure with community partners (5 self-advocates, 3 caregivers, 3 speech-language pathologists, 2 psychologists, 2 special education teachers). To address the second aim, we recruited 73 U.S.-based, English-speaking participants ages 13 to 30 years (55% with structural language impairment; 29% with NVIQ <70 to 84; 16% American Indian, Native American, or Alaska Native, 26% Asian, 52% Black, 36% multiracial and not mutually exclusive with other racial categories, 6% Pacific Islander, 27% white; 12% other and 18% Hispanic/Latine) and caregivers ($N=51$). Participants and caregivers completed questionnaires about self-determination as interviews, services (Newman et al., 2011), and educational and career goals. To address Aim 1, we analyzed interviews using inductive thematic analysis (Braun & Clarke, 2012). To address Aim 2, we compared clinical assessment and person-centered outcomes. To merge data, we interpreted quantitative data in more depth using qualitative data via the constant comparative method (Glaser & Strauss, 1967).

Results: Use of strategies for different language profiles and transparent partnering practices led to 100% partner retention. Partner strategies included planning for multiple synchronous and asynchronous modalities of engagement, including providing agendas with language tailored to each partner, use of visual schedules, and pre-planning to tailor language use (e.g., planning how to rephrase language as needed and how to share information). Practices included adequate compensation and mutual benefit, given partner income restrictions, and balancing sharing technical information about project development (e.g., grant proposals) with individual language and cognitive skills. Interview themes indicated personal perceptions about autonomy shaped self-determination. Also, there was no simple relationship between clinical assessment information (language, NVIQ, autism traits) and person-centered measures (self-determination, personal goals).

Conclusions: Findings supported the feasibility of engaging autistic people with HSN who are the least likely to be part of research, while also honoring their contributions. Using personalized strategies, ensuring partners choose how to represent themselves on the team (including different models of disability), and working to bring benefit to all partners was important. Current projects build upon this approach to CBPR and have implications for partnering with autistic people who have HSN.

223.003 Promoting the Autonomy of Autistic Adults with Intellectual Disabilities in Daily Life Choices: Co-Design of a Neurodiversity-Affirming Toolkit of Practical Resource

J. Ryan, *Rehabilitation Medicine, University of Alberta, Edmonton, AB, Canada*

Background: The neurodiversity movement wants autistic people to exert as much autonomy as possible with the support needed (Kapp, 2023). Autonomy - feeling in control of one's life, making choices, and acting voluntarily - is a fundamental human right regardless of disability and a key component of well-being (Ryan & Deci, 2017). Autistic people with and without intellectual disability (ID) experience decreased autonomy, perhaps due to having few opportunities (e.g. limited by presumed incompetence) and/or little support to act volitionally (Cheak-Zamora et al., 2020).

Objectives:

Co-design a toolkit of practical resources that staff can use to promote autonomy for autistic people with ID in the context of community-based support.

Methods:

We used experience-based co-design (EBCD) to share agency and focus on evidence-informed practice to design a toolkit grounded in the real-world experiences of autistic people and the professionals who support them. Our research team comprised eight people: 4 autistic community partners, 2 with ID; 2 autistic researchers; a non-autistic researcher; and an occupational therapist.

Results:

We recruited 20 participants: 14 autistic people (5 with ID and 2 support workers); and 6 non-autistic clinicians and support workers.

Initial Resource Exploration

We conducted an organized internet search to identify existing tools relevant to supporting autistic individuals. The review highlighted a wide range of resources, categorized as follows:

- In-the-Moment Choice-Making Tools: Supporting immediate decisions.
- Longer-Term Goal-Setting Tools: Aiding in planning and achieving personal goals.
- Training Resources for Staff: Educating support workers and caregivers.
- Training Resources for Autistic People: Empowering individuals in self-advocacy and autonomy.

Workshop 1: Understanding Perspectives

Participants highlighted five critical principles:

- Get to know me: Build an understanding of each individual.
- Don't make assumptions: Avoid preconceived ideas about abilities or preferences.
- Clear communication: Use direct, accessible, and consistent communication.
- Advocate with me: Empower autonomy by standing alongside the individual.
- Always be kind and respectful: Foster empathy- and dignity-based relationships .

Workshop 2: Refining Strategies

To further explore the implementation of strategies using the in-the-moment choice-making tools from our resource exploration.

- Existing tools align with the five themes identified in Workshop 1.
- There was a notable gap: no tools exist specifically for helping supporters communicate clearly with autistic people with ID.

Workshop 3: Pre-User Testing of Prototypes

Participants reviewed and provided feedback on four prototype tools:

1. One-Page Profile: A concise summary of the individual's preferences, needs, and communication style.
2. Communication Chart: A guide for understanding and responding to the individual's communication methods.
3. Personal Environment Preferences: A tool to understand an individual's preferences and needs within environments.
4. Exploring Choice-Making Supports: A resource to help individuals make informed daily choices.

Feedback informed the creation of the final open-access toolkit.

Conclusions: Autistic adults without and with ID, service providers, and caregivers can co-design new resources that address critical gaps. They co-developed a neurodiversity-affirming toolbox of practical resources to equip support staff and caregivers to empower autistic individuals with ID to make choices. It reinforced the importance of trust, clear communication, and mutual respect in promoting autonomy.

223.004 "Communicatively Resourceful, Interpretatively Curious": (mis)Communications in Social Care Settings for Autistic People with High Support Needs.

H. E. Sutherland, Salvesen Mindroom Research Centre, University of Edinburgh, Edinburgh, United Kingdom

Background:

Recent neurodiversity-oriented research has found that nonautistic people can also struggle to understand autistic people (the double empathy problem, or “DEP”; Milton, 2012). However, this research has almost exclusively focused on autistic people with lower support needs (LSN). We wanted to know if and how the neurodiversity paradigm and the DEP could help us understand social communicative interactions between autistic people with higher support needs (HSN) and the practitioners supporting them in support services.

Objectives:

- 1) To characterise the kinds of social and communicative interactions that occur between staff and supported people in support settings.
- 2) To understand staffs’ perspectives on socialising and communicating with autistic people with HSN.
- 3) To consider the findings from (1) and (2) in the context of the neurodiversity paradigm.

Methods: The study took place in the UK, in 2022-2024, in two day-support services for autistic adults with HSN (who needed 24/7 1-to-1 care, often had an intellectual disability, and were often minimally or non-speaking). 12 supported people and 21 staff took part in the study. Data collection occurred on 28 days over the course of a year. We used ethnographic methods, which included participant observation; interviewing of practitioners; analysing documents from the services; and reflexive practice from the ethnographer, HEAS, who is autistic. We used grounded theory as our analytic approach.

Results:

Supported people often had specific communicative difficulties (e.g. articulation issues, long processing time, limited vocabulary), which could make communication with them difficult. However, staff sometimes struggled to understand supported people’s communication instead due to normative expectations (e.g. expecting spoken language, failing to understand stimming, not considering autistic sensory needs). Staff perceptions of risk could also cause misunderstandings, due to increased interactional stress.

Staff often felt responsible for “not understanding” supported people, and rarely framed communication breakdowns as due to supported people “failing to communicate”. Supported people often seemed frustrated at being misunderstood. They also used strategies to accommodate staffs’ difficulties understanding them (e.g. repeating themselves, rephrasing, or changing communication modalities).

Despite these difficulties, practitioners and supported people could have positive social interactions, good communication, and close friendships. Experiences of relational closeness and attunement between staff and supported people often occur when communication was successful.

Successful communication often involved both parties adapting their communication styles to the other party’s needs.

Conclusions: The neurodiversity paradigm and the DEP are useful for understanding autistic people with HSN’s experiences in a support setting. Cross-neurotype communication can be difficult, for a number of reasons. Some of these are seemingly intrinsic to the supported people’s autism and/or intellectual disability; others are relational, and due to the difficulties in overcoming differences in social expectations. Despite this, however, cross-neurotype friendships could still flourish between staff and supported people. This suggests that focusing on mutual cross-neurotype understanding could help improve care provision and outcomes for autistic people with HSN, though more research is needed. These findings point to the value of applying neurodiversity paradigm perspectives to research that includes autistic people with HSN.

Panel Session**224 - From Systems Biology to Drug Targets and Biomarkers in Autism Spectrum Disorder: Bridging the Lab and Clinic**

May 3rd, 2025, 10:30 AM - 12:30 PM - 606-607

Panel Chair: Haitham Amal, *Neurobiology and Neurology, Boston Children's Hospital - Harvard Medical School, Boston, MA, Neurobiology and Neurology, Hebrew University of Jerusalem, Boston, Israel, Neurobiology and Neurology, Boston Children's Hospital - Harvard Medical School, Boston, MA, Neurobiology and Neurology, Hebrew University of Jerusalem, Boston, Israel*

From Systems Biology to Drug Targets and Biomarkers in Autism Spectrum Disorder: Bridging the Lab and Clinic The goals of this session to expose the INSAR community to the extensive work that is done in lab and is translated into clinical studies. The session will emphasize the pre-clinical and IND studies for FDA drug approval as well as diagnostic projects that led to DFA clearance.

Introduction

H. Amal, *Hebrew University of Jerusalem, Israel*

224.001 Using iPSCs to Identify Drug Targets for ASD

S. A. Lipton, *Molecular Medicine, Scripps Research Institute, La Jolla, CA; Neurosciences, UC San Diego, La Jolla, CA*

Background: MEF2C is a transcription factor discovered by the Lipton laboratory that is critical for normal neurodevelopment, and whose loss-of-function mutation in humans results in MEF2C haploinsufficiency syndrome (MCHS), a severe form of autism spectrum disorder (ASD)/intellectual disability (ID). Despite prior animal studies of *MEF2C* heterozygosity to mimic MCHS, MCHS-specific mutations have not been investigated in detail previously, particularly in a human context as patient-derived human induced pluripotent stem cells (hiPSCs) afford. Here, we use patient hiPSC-derived cerebrocortical neurons and cerebral organoids to characterize MCHS deficits, identify new drug targets, and develop a lead drug candidate.

Objectives: To develop a robust, reproducible hiPSC-based model of ASD/ID using 2-dimensional (2D) cultures and 3D cerebral organoids that can be probed both molecularly and electrophysiologically with novel therapeutics.

Methods: We generated MCHS patient-derived hiPSCs and isogenic WT controls using CRISPR/Cas9 technology. We then differentiated the hiPSCs into cerebrocortical neurons in 2D cultures and 3D cerebral organoids. These MCHS mutations manifest varying degrees of haploinsufficiency and are disease specific. This approach allowed us to study human neuronal development and function in the presence of patient-relevant mutations in MEF2C-deficient compared to isogenic control cells. Using these techniques, we have elucidated molecular and electrophysiological mechanisms underlying MCHS pathophysiology. We have also tested novel compounds via a multiomics approach, including single cell RNA-sequencing (scRNA-seq), proteomics, and patch-clamp and multielectrode array (MEA) recordings on WT vs. MCHS neurons and organoids.

Results: We demonstrate network-level hyperexcitability in MCHS neurons, mediated predominantly by excessive extrasynaptic (e)NMDA-type glutamate receptor activity contributing to excitatory/inhibitory (E/I) imbalance. We develop a lead therapeutic candidate, represented by the eNMDA receptor antagonist, NitroSynapsin, with dual functional attributes of open-channel block and redox modulation of NMDA receptor-operated channels, that corrects the aberrant electrical hyperactivity associated with abnormal phenotypes. Additional drug candidates have been identified by a gene expression complementarity approach using the Connectomics Map (Broad Institute). In this technique, we utilize the CMAP/LNC1000 and ReFRAME chemical library databases that identify compounds that correct the expression of differentially expressed genes (DEGs) identified in MCHS vs. isogenic WT neurons and glia using our scRNA-seq database collected on cerebral organoids (Trudler et al. *Mol. Psych.*, 2024).

Conclusions: During neurodevelopment, MEF2C regulates many ASD-associated gene networks, suggesting that treatment of MCHS deficits may possibly help other forms of ASD as well. Here, we identify a lead candidate drug, NitroSynapsin, that corrects E/I imbalance and protects synapses in MCHS hiPSC-derived neurons. We also develop a pipeline of other drugs that correct these abnormal phenotypes using the Connectomics Map and other approaches.

224.002 A Novel Combined Drug Therapy for Autism Spectrum Disorder

H. Amal, Neurobiology and Neurology, Hebrew University of Jerusalem, Boston, Israel

Background: Autism spectrum disorder (ASD) includes various conditions that share a core of behavioral deficits manifested by abnormalities in social interactions and communication, restricted interests, and repetitive behavior. To date, no effective **single drug** treatment has been found for ASD.

Objectives: **Here we developed a novel combo drug to reverse a wide spectrum of ASD phenotypes by targeting three key molecular pathways identified by our unique three-way proteomics platform.**

Methods: Three-way proteomics including global-, phospho-, and S-nitroso-proteomics were conducted on blood samples from kids with low functioning ASD as well as on brain samples from three different mouse models: Shank3, Cntnap2, and Nlgn3. This was followed by biochemical, pharmacological, and behavioral experiments.

Results: Using SNO-proteomics, we found that *de novo* S-nitrosylation (a nitric oxide (NO)-mediated protein modification) of TSC2 causes aberrant activation of the mTOR signaling. Using phosphoproteomics, we found a reduction in GSK-3 β phosphorylation at Ser9, which affects brain development by disrupting the Wnt/ β -catenin signaling pathway. Interestingly, global proteomics revealed an abnormal upregulation of the catalytic subunit of the mitochondrial ATP synthase, which may delay synaptic development via an opening of the mitochondrial permeability transition pore (mPTP). Drugs affecting each of these pathways (NO/mTOR, GSK-3 β /Wnt, and mPTP) attenuated deficits in a specific behavioral phenotype, whereas their combined application showed signs of a synergistic effect.

Conclusions: **The unique approach of this project is to apply a combination of drugs modulating the major pathways to reverse the ASD phenotype. This multidisciplinary work is expected to lead to a breakthrough in ASD therapy and open up the field of neurology to the new concept of combinatorial therapy.**



224.003 De Novo and Somatic Mutations Impacting Autism: Toward Precision Medicine

I. Gozes¹ and L. Gabis², (1)Tel Aviv University, Tel aviv, Israel, (2)Pediatric Neurology and Developmental Disabilities, Tel Aviv University, Tel Aviv, Israel

Background: Discovered in our laboratory, activity-dependent neuroprotective protein (ADNP) is susceptible to de novo mutations as well as somatic mutations causing cognitive impairments/intellectual disabilities, within the autism spectrum disorders, namely the ADNP syndrome (also known as Helsmoortel Van Der Aa syndrome). Davunetide (NAP, CP201 and AL-108) is an investigational drug derived from ADNP that is suggested to protect against deleterious effects of ADNP mutations.

Objectives: We set out to investigate the structure/function relations of ADNP mutations and activities in cell cultures, animal models and affected individuals. We further set out to discover the breadth of davunetide protection in cellular and animal models toward clinical development.

Methods: In silico, genome editing, in vitro, in vivo and patient-related questionnaires were implemented.

Results: Focusing on davunetide (NAP= single amino acid letter code, NAPVSIPQ), we have recently shown that NAPVSIPQQ to NAPVSIPQE de novo point mutation in ADNP causes a mild developmental syndrome, while changing the size of the electrostatic patch on ADNP (1). This finding was further linked with the davunetide sequence being essential for cytoskeletal organization/cellular signaling through interactions with microtubule end binding proteins (EB1 and EB3), association with beta catenin, SH3-domain-containing proteins (like the autism/schizophrenia-linked SHANK3) and with an ADNP zinc finger domain, linked with transcriptional regulation (2). Focusing on ADNP, by a longitudinal genotype-phenotype (Vineland Questionnaire) of 15 ADNP syndrome cases, we highlighted mutated protein length and structural characteristics correlation with communicative abilities, further accentuated in males (3). Our current research surprisingly identified protective inherited ADNP mutations (Gozes et al., in preparation). In contrast, complete ADNP deficiency in mice inhibits neural tube closure and is incompatible with life, while haploinsufficiency predicts and mimics the ADNP syndrome. Truncating ADNP mutations in the nuclear-localization area induced sex-dependent gain of toxic function (4). Mouse model treatment with davunetide ameliorated many of the ADNP haploinsufficiency and mutation-related deficits. Pathologically, and considering ADNP/davunetide critical microtubule/Tau protection, we discovered Alzheimer's like tauopathy in ADNP syndrome patients and mice, which is inhibited by davunetide treatment, in mice.

Conclusions: With our recent clinical results discovering sex differences in the pure tauopathy progressive supranuclear palsy coupled with efficacy for davunetide in women (5) and with davunetide sex-dependently boosting memory in prodromal Alzheimer's disease (6), we are poised for clinical trials in ADNP syndrome, further armed with Orphan Drug Designation and Pediatric Rare Disease Designation (ExoNavis Therapeutics)

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224.004 Small Molecule Efficacious Therapeutic Treatment for the Neurodevelopmental Disorder CTNNB1 Syndrome

M. Jacob, Tufts University, Boston, MA

Background: *CTNNB1* is a high-confidence risk gene for intellectual disabilities, autism spectrum disorders and CTNNB1 syndrome. This syndrome is a monogenetic neurodevelopmental disorder characterized by intellectual disabilities, developmental delays, motor disabilities (truncal muscle hypotonia, distal hypertonia, spastic gait), and reduced or no language, as well as autism in a subset of individuals. It is caused by *de novo* heterozygous loss-of-function pathogenic variants in *CTNNB1*, the gene that encodes the protein β -catenin (β -cat). β -cat is essential for proper brain and muscle function, via its dual roles in cadherin-based synaptic adhesion complexes and as a transcription co-activator with LEF/TCF proteins in the canonical Wnt signal transduction pathway. Insufficient levels of this critical protein are the core molecular pathology in CTNNB1 syndrome. The cognitive and motor deficits significantly impact quality of life for affected individuals and their families. Treatment options are currently lacking. We have a unique opportunity to correct this and benefit individuals with CTNNB1 syndrome by capitalizing on our recent identification of a small molecule which significantly normalizes β -cat levels and phenotypes in our preclinical mouse and human cell models, including CTNNB1 patient derived cells.

In addition to *CTNNB1*, several other human gene mutations linked to intellectual disabilities and autism also cause reduced β -cat levels and/or functions. These disorders further highlight the importance of identifying corrective treatments for CTNNB1/ β -cat dysregulation and may benefit from the therapeutic strategies that we are developing for CTNNB1 syndrome.

Objectives: To identify efficacious and safe therapeutic compounds as lead drug candidates to advance the design of clinical trials for this unmet medical need. The goal is to raise the insufficient β -cat protein levels to closely resemble, and not exceed, the normal baseline range of controls, and thereby correct the phenotypes.

Methods: We are testing the therapeutic efficacy of high selectivity small molecule inhibitors of glycogen synthase kinase (GSK)3, the constitutively active endogenous negative regulator of β -cat levels, in preclinical *in vivo* mouse and *in vitro* human cell models, including CTNNB1 syndrome patient derived cells. We assess the phenotypes using quantitative molecular, biochemical, electrophysiological and behavioral analyses.

Results: We have identified an efficacious therapeutic in our preclinical *in vivo* mouse model of *Ctnnb1* germline heterozygosity that displays key features resembling human CTNNB1 syndrome. We show that a small molecule high-selectivity inhibitor of the endogenous negative regulator GSK3 significantly normalizes β -cat levels and molecular, functional, cognitive and motor phenotypes in *Ctnnb1* heterozygote mice, relative to wildtype littermates. The beneficial outcomes were achieved with treatment initiated in symptomatic late adolescent mice. Pilot studies suggest the therapeutic potential extends to human cells by showing significantly improved β -cat levels in human glutamatergic neurons heterozygous for *CTNNB1* and in multiple different CTNNB1 patient derived iPSCs carrying diverse mutations that span the gene. We are now conducting critical tests for therapeutic efficacy and safety in cortical excitatory neurons derived from the CTNNB1 patient iPSCs.

Conclusions: Our data provide new insights into brain molecular and functional changes, and the first evidence for an efficacious treatment with therapeutic potential for individuals with CTNNB1 syndrome.

225 - Beyond Categorical Classifications of Autism: Utilizing Dimensional Approaches to Advance Science and Clinical Practice

May 3rd, 2025, 2:00 PM - 4:00 PM - 6B

Panel Chair: Emily Spackman, *Psychiatry and Behavioral Sciences, Department of Psychiatry and Behavioral Sciences, Stanford University, Stanford, CA*

Discussant: Robert Krueger, *University of Minnesota, University of Minnesota, MN*

Pronounced within-diagnostic heterogeneity and high rates of co-occurrence among neurodevelopmental and neuropsychiatric conditions highlight the limitations of current diagnostic systems. These limitations are particularly prominent with regard to the autism diagnostic criteria. The structure of diagnostic criteria dictates assessment and diagnosis, measure development, support provision, and research yield. Therefore, utilizing dimensional approaches to develop empirically-informed diagnostic criteria is crucial for advancing autism research and clinical practice. This panel aims to (i) compare the DSM-5 structure of restricted and repetitive behaviors to empirically-derived alternatives, evaluating the placement of sensory features within diagnostic criteria, (ii) validate a novel and comprehensive measure of the social motivation domains outlined in the National Institute of Health's Research Domain Criteria (RDoC) to advance the characterization of autism features and facilitate transdiagnostic research, and, finally, to characterize structural relationships between autism features and broader neurodevelopmental and neuropsychiatric symptoms utilizing (iii) state-of-the-art psychometric approaches and (iv) the Hierarchical Taxonomy of Psychopathology (HiTOP), as a novel, evidence-based nosology. By integrating reviews of current diagnostic criteria alongside applications of dimensional approaches (i.e., RDoC and HiTOP) in research and clinical practice, the proposed panel holds promise for facilitating a timely discussion around the future of autism assessment and diagnosis.

Introduction

E. Spackman, *Department of Psychiatry and Behavioral Sciences, Stanford University*

225.001 Are Sensory Features a Subdomain of Restricted and Repetitive Behaviors? Evaluating Empirical Support for the DSM-5 Conceptualisation of Repetitive Behaviors

E. Spackman¹, **L. Chetcuti**², **E. K. Baker**³, **T. W. Frazier**⁴, **A. Y. Hardan**³ and **M. Uljarevic**³, (1)*Psychiatry and Behavioral Sciences, Department of Psychiatry and Behavioral Sciences, Stanford University, Stanford, CA*, (2)*Psychiatry and Behavioral Sciences, Stanford University, Stanford, CA*, (3)*Psychiatry and Behavioral Sciences, Stanford University, Stanford, CA*, (4)*Psychology, John Carroll University, Cleveland, OH*

Background: Following calls to formally recognise sensory differences in the autism diagnostic criteria, the DSM-5 introduced sensory features as a fourth subdomain of restricted and repetitive behaviours (RRBs), alongside (1) stereotyped movement and speech, (2) insistence on sameness, and (3) intense interests. However, this categorisation was developed based on expert consensus, rather being empirically derived and subsequent psychometric investigations have shown only mixed support. More specifically, sensory features encompass a wide range of different behaviours, many of which are neither restricted nor repetitive in nature, raising concerns over their conceptualisation under RRBs and as a unidimensional domain. Similarly, repetitive motor behaviours (RMB) and repetitive language (RL) have also emerged as distinct factors in several factor analytic investigations of RRB measures and likely have distinct trajectories and correlates, despite comprising a unidimensional subdomain in the DSM-5. Finally, intense interests in common topics (restricted interests [RI]) and in topics generally not salient outside of autism (unusual interests [UI]) have also been suggested to represent distinct domains, showing opposite patterns of association with age, IQ, and social motivation. The structure outlined in diagnostic systems has far reaching implications for assessment and diagnosis, measure development, support provision, and/or the yield of research across the autism field. Therefore, drawing on structural evidence to establish robust criteria is essential.

Objectives: To compare the DSM-5 model of RRBs against empirically derived alternatives, evaluating whether sensory features are better conceptualised as a part of RRBs or their own unique domain.

Methods: Cross-measure confirmatory application of exploratory structural equation modelling was used to compare empirical support for different proposed latent RRB structures in a large sample of 1368 autistic children and adolescents ($M_{age}=10.78$, $SD_{age}=4.14$; 301 females; 24% intellectual disability). Four correlated factor models and eight bifactor models were compared to evaluate the lower- and higher-order latent structure of RRBs. Sensory features were assessed using the Sensory Experiences Questionnaire (SEQ-3) and RRBs using the Dimensional Assessment of Restricted/Repetitive Behaviours (DARB). Findings were then replicated using the Repetitive Behaviour Scale – Revised (RBS-R).

Results: The four-factor DSM-5 model consistently demonstrated poorest fit across models (CFI= 0.881 to 0.895; RMSEA= .028 to .026). The model comprising 10 distinct subdomains (RMB, RL, IS, RI, UI, obsessive-compulsive behaviour, self-injurious behaviour, sensory hypersensitivity, sensory hyposensitivity and sensory seeking) showed the best fit amongst correlated models (CFI=0.940; RMSEA= .021).

Comparison of higher-order latent structures found that models with distinct General RRB and General Sensory factors showed better fit (CFI= 0.940 to 0.950; RMSEA= .021 to .019) than models consisting of a combined General RRB/sensory factor (CFI= .895 to .945; RMSEA= .026 to .020). A similar pattern of findings was observed in RBS-R replications.

Conclusions: Findings indicate a need to revise the RRB structure outlined in the DSM-5. More specifically, sensory features should be recognised as a multidimensional construct, consisting of at least three subdomains and may be better characterized as a distinct domain to RRBs.

Additionally, RMB and RL, as well as RI and UI, should be recognized as distinct subdomains.

225.002 Advancing a Biologically-Grounded Taxonomy of Social Motivation

L. Chetcuti^{1,2}, **A. Y. Hardan**¹, **J. M. Phillips**³, **T. W. Frazier**⁴ and **M. Uljarevic**³, (1)*Psychiatry and Behavioral Sciences, Stanford University, Stanford, CA*, (2)*Telethon Kids Institute, University of Western Australia, Perth, Western Australia, Australia*, (3)*Psychology, John Carroll University, Cleveland, OH*

Background: Differences in social motivation are a prominent feature of autism and may contribute to its etiology. However, the DSM-5's operationalization of these differences, outlined in Criterion A3 ('deficits in developing, maintaining, and understanding relationships') and Criterion A1 ('deficits in social-emotional reciprocity'), lacks precision, factorial evidence, and alignment with underlying biological mechanisms. The National Institute of Health's Research Domain Criteria (RDoC) proposes a nosological shift toward describing clinical phenomenology through scientifically validated biobehavioral dimensions of human functioning. In autism, this shift requires reconceptualizing diagnostic criteria to address more granular processes underlying social motivation. A reward processing framework emphasizes the roles of orienting, wanting, pursuing, liking, and learning in responsiveness to both social and nonsocial stimuli. Adopting this framework could aid in identifying converging and diverging functional profiles within and across diagnostic populations, informing personalized interventions. However, a major challenge remains the lack of measurement tools capable of capturing individual differences in social motivation at the level of these reward-based processes.

Objectives: To conduct an initial psychometric validation of the Stanford Social Dimensions Scale-2 (SSDS-2), an informant-report measure aimed at overcoming the limitations of existing instruments by comprehensively characterizing individual variability in reward-driven processes that are essential for understanding social motivation differences.

Methods: SSDS-2 items were developed to capture each of the five identified social motivation processes and were refined through an iterative process guided by the NIH Patient-Reported Outcome Measurement Information System framework, which included a systematic review of existing literature, factor analyses of existing instruments, and stakeholder engagement. Parents of 943 children diagnosed with autism, aged 5-to-17 years ($M [SD]=11.23 [3.56]$; 76% male) recruited from the SPARK (Simons Foundation Powering Autism Research for Knowledge) research match, completed the SSDS-2. Confirmatory application of exploratory structural equation modeling (ESEM) tested the a priori five-factor structure of the SSDS-2. Model fit was evaluated using the comparative fit index (CFI), Tucker–Lewis index (TLI), root mean square error of approximation (RMSEA), and its 95% confidence interval. The stability of the final factor solution was examined across subsamples based on sex, age, and cognitive level. Convergent and divergent validity were established against the Social Responsiveness Scale-2nd Edition (SRS-2), Child Social Preference Scale (CSPS), and Strengths and Difficulties Questionnaire (SDQ).

Results: Analyses indicated strong model fit for the a priori-specified model, comprising separate orienting, wanting, pursuing, liking, and learning factors ($CFI=0.93$, $TLI=0.92$, $RMSEA=0.06$ [90% CI: 0.06, 0.06], $SRMR=0.04$). SSDS-2 items demonstrated robust (>0.40) and statistically significant loadings on their hypothesized factors, with minimal cross-loadings on non-hypothesized factors. All factors showed significant correlations with each other ($p<.05$), ranging from weak (learning-wanting, $r=.04$) to strong (wanting-pursuing, $r=.64$). The factor solution demonstrated stability across sex, age, and cognitive level subgroups. Significant positive correlations were observed between SSDS-2 subscales and corresponding subscales of the SRS-2, CSPS, and SDQ.

Conclusions: These results underscore a multidimensional conceptualization of social motivation and highlight the utility of the SSDS-2 in providing more nuanced and biologically valid clinical descriptors and diagnostic criteria for autism, in accordance with RDoC principles.

225.003 Towards Identifying an Accurate Model of Internalizing Symptoms in Autism: The Importance of Incorporating Autistic Traits within a Transdiagnostic Model

T. Rosen^{1,2}, C. Rodriguez-seijas³, K. D. Gadow⁴ and M. D. Lerner⁵, (1)St. Christopher's Hospital for Children, Philadelphia, PA, (2)Department of Psychiatry, Drexel University College of Medicine, Philadelphia, PA, (3)Department of Psychology, University of Michigan, Ann Arbor, MI, (4)Department of Psychiatry, Stony Brook University, Stony Brook, NY, (5)AJ Drexel Autism Institute, Drexel University, Philadelphia, PA

Background: Autistic youth are at increased risk for experiencing co-occurring internalizing symptoms (e.g., van Steensel et al., 2011). Some presentations are consistent with standard diagnostic (e.g., *DSM*) criteria, yet others suggest distinct, altered symptom presentation resulting from overlap with – or influence of – autism traits (e.g., Kerns et al., 2014). Additionally, there is emerging evidence that a transdiagnostic internalizing factor explains the co-occurrence of anxiety and depression in autism (Rodriguez-Seijas et al., 2019). The influence of autism traits on previous factor models of internalizing symptoms remains to be explored.

Objectives: The current examination sought to identify an improved model of internalizing symptoms by examining a broader, transdiagnostic model of internalizing symptoms that allowed internalizing symptoms to load with autistic traits.

Methods: Participants were ages 6-18, diagnosed with autism in an outpatient clinic ($N=280$; $M_{age}=10.7$, $SD_{age}=3.4$) or referred to a psychiatry outpatient clinic with no autism diagnosis ($N=1195$; $M_{age}=12.1$, $SD_{age}=3.4$). Internalizing symptoms and autism traits were measured using the parent CASI-4R (Gadow & Sprafkin, 2008), a *DSM*-referenced rating scale. Following confirmatory factor analysis (CFA: Table 1), an exploratory factor analysis (EFA) of anxiety and depression symptoms, and autism traits, was conducted. Fit indices from a CFA of the CASI-4R (e.g., *DSM*) structure of these symptoms and traits were then compared against fit indices from the EFA-derived model.

Results: Fit indices from the baseline CFA showed poorer fit of *DSM* internalizing symptoms in the autistic compared to non-autistic sample (see Table 1). Several revisions were made to improve the baseline model, though fit indices were still insufficient. A 3-factor EFA model of internalizing and autism traits was parameterized with factors representing (1) broad internalizing symptoms (anxiety and depression), (2) social anxiety symptoms, and (3) autism traits (Table 2). The EFA model demonstrated better fit compared to the *DSM* model (Table 1), though fit indices were still inadequate.

Conclusions: Results from the baseline CFAs suggest that the *DSM* structure of internalizing symptoms may not adequately capture these symptoms in autism. It may be that allowing depression and anxiety symptoms to covary in the EFA helped improve model fit, consistent with previous applications of a transdiagnostic approach in other populations. Results also highlight the importance of accounting for autism traits when modeling co-occurring internalizing symptoms, given that both internalizing factors (e.g., factors 1 and 2) included autism traits. This finding is consistent with theories that internalizing symptoms are influenced and perhaps even altered by autism traits (e.g., Wood & Gadow, 2010). In addition, findings are consistent with previously-validated autism-influenced presentations of anxiety, and are the first to identify models consistent with autism-influenced depression and autism-influenced internalizing symptoms more broadly. Although fit indices were improved for the EFA, it nonetheless exhibited inadequate fit indices. Overall, findings highlight the importance of developing more comprehensive, transdiagnostic internalizing models of distinct symptom presentation in autism. Towards this end, it will be important to consider additional relevant constructs, such as sensory differences, emotion regulation challenges, and externalizing symptoms while incorporating autism traits into these models.



225.004 Where Do Autistic Traits Fit in Transdiagnostic Psychiatric Frameworks? New Insights from Transdiagnostic Research
G. Michelin¹, **W. Liao¹**, **C. Caserini¹**, **T. Eley²**, **M. Malanchini¹**, **K. Rimfeld³** and **S. Wilson⁴**, (1)School of Biological & Behavioural Sciences, Queen Mary University of London, Bethnal Green, London, United Kingdom, (2)Department of Behavioural Genetics, Kings College London, London, United Kingdom, (3)Royal Holloway University of London, Egham, Surrey, United Kingdom, (4)Institute of Child Development & Department of Psychology, University of Minnesota, Minneapolis, MN

Background: Autism and other neurodevelopmental conditions, including attention-deficit/hyperactivity disorder (ADHD) and learning and intellectual disabilities, are grouped together in the DSM-5 and ICD-11 to reflect their common co-occurrence and shared characteristics. Yet, reliance on categorical diagnoses poses significant challenges in both research and clinical settings (e.g., arbitrary diagnostic boundaries, high heterogeneity). Taking a transdiagnostic dimensional approach provides a useful alternative for addressing these limitations and characterizing the common co-occurrence and developmental continuity between autism and other neurodevelopmental and mental health conditions. Yet, autistic and other neurodevelopmental traits have not been adequately considered in current transdiagnostic frameworks (e.g., Hierarchical taxonomy of Psychopathology, HiTOP), even though doing so would have fundamental research and clinical implications.

Objectives: This presentation aims to (1) review recent evidence indicating that autistic and other neurodevelopmental traits belong to a novel transdiagnostic “neurodevelopmental spectrum”, reflecting their dimensional nature and high co-occurrence; (2) present new data on the structure of the neurodevelopmental spectrum across development and its association with key predictors and outcomes in a UK nationally-representative longitudinal study.

Methods: (1) We developed a conceptual framework based on comprehensive review of studies supporting the structure, validity, and predictive utility of the neurodevelopmental spectrum. (2) Parents of children from the Twins Early Development Study (TEDS) reported on a broad range of neurodevelopmental traits and mental health problems at age 7 (N=15,668; 51% female), 12 (N=12,465, 52% female), and 16 (N=10,261; 55% female). Hierarchical exploratory factor analysis of items collected at each wave delineated a neurodevelopmental factor alongside other transdiagnostic factors (e.g., internalizing, externalizing) across development. Linear mixed models tested the association of the neurodevelopmental factor at ages 7-16 with early environmental/developmental predictors and with current and later cognitive, educational, and mental health outcomes.

Results: (1) A large body of work, spanning studies on covariation and phenotypic structure, shared biological, cognitive and neural profiles, similar developmental course, and predictive and clinical utility, support the inclusion of autistic and other neurodevelopmental traits into a neurodevelopmental spectrum. (2) In TEDS, a neurodevelopmental factor capturing autistic traits, inattention, hyperactivity, and learning difficulties emerged across development, alongside externalizing (impulsivity, oppositionality, and callousness) and internalizing (anxiety and depression) factors. Higher neurodevelopmental factor scores at ages 7-16 were associated with low birth weight ($\beta=-.05/-0.10$, $p<.001$) and age-3 language and cognitive difficulties ($\beta=-.11/-0.29$, $p<.001$). Furthermore, higher neurodevelopmental factor scores predicted worse cognitive, educational, and mental health outcomes both concurrently and longitudinally to a greater extent than DSM autism diagnoses.

Conclusions: Our literature review and new data show that assessing autistic traits within a transdiagnostic neurodevelopmental spectrum can further our understanding of its developmental pathways and is useful for predicting clinically relevant outcomes across development. Based on this body of work, we argue that incorporating a new neurodevelopmental spectrum into transdiagnostic frameworks has considerable potential for transforming our understanding, classification, assessment, and clinical practices around autism and other neurodevelopmental and mental health conditions.

Panel Session

226 - Trials of Caregiver-Focused Interventions in Diverse Settings: Results and Key Learnings

May 3rd, 2025, 2:00 PM - 4:00 PM - 6C

Panel Chair: Jonathan Green, University of Manchester, Manchester, United Kingdom

Discussant: Alexia Rattazzi, PANAACEA, Buenos Aires, ARGENTINA

Proactive stepped-care provision for autistic children entails supporting caregivers at the earliest opportunity to understand their child, parent them in an attuned way, support their development, and feel resilient and adaptable in the face of parenting complexities and external stressors. Caregiver-focussed approaches have potential not only to improve caregiver wellbeing and empowerment, but to ensure a responsive and nurturing goodness-of-fit around the child. Such interventions must respond to the needs of caregivers within the context in which they will be implemented, be culturally sensitive, and scalable. Moreover, they must be supported by rigorous evidence of acceptability, feasibility of implementation, and effectiveness. This panel brings together results and key learnings from rigorously-designed and -conducted studies of innovative caregiver-focussed approaches evaluated in diverse international settings. This includes two well-powered clinical effectiveness trials – the COMPASS trial of non-specialist-delivered social communication intervention in India and the REACH-ASD trial of a post-diagnostic psycho-educational and psycho-therapeutic programme in the UK, along with a feasibility trial of an intervention promoting sensitive responsiveness in caregivers of children with higher likelihood of autism in India (LiL'STEPS), and an evaluation of a multiphase platform to increase access to the WHO Caregiver Skills Training programme in community settings in Canada.

Introduction

A. Rattazzi, PANAACEA, Buenos Aires, ARGENTINA

226.001 Preliminary Outcomes from a Parallel and Single-Blind Feasibility Randomized Controlled Trial in India of a Novel Caregiver Mediated Intervention, LiL' STEPS, for Infants at Elevated Likelihood for Autism

S. S. Meera¹, **P. P. Vasuki²**, **M. Srikanth³**, **D. Swaminathan⁴**, **R. Raju⁵**, **R. Johnson⁶**, **S. Volme⁷**, **J. V. S. Kommu⁸**, **L. R. Watson⁹** and **D. B. Nair¹⁰**, (1)National Institute of Mental Health and Neurosciences (NIMHANS), Bangalore, Karnataka, India, (2)National Institute of Mental Health and Neurosciences (NIMHANS), Bangalore, India, (3)National Institute of Mental Health and Neurosciences (NIMHANS), Bangalore, India, (4)National Institute of Mental Health and Neuro Sciences (NIMHANS), Bangalore, Karnataka, India, (5)National Institute of Mental Health and Neuro Sciences (NIMHANS), Bangalore, India, (6)Department of Health Sciences, University of North Carolina at Chapel Hill, Chapel Hill, NC, (7)CommuniVerse India, Mumbai, India

Background: About 40-50% of infant siblings of autistic children are at elevated likelihood for autism or other neurodevelopmental delays (EL-A).¹ Preliminary evidence suggests very early support be given to these infants through caregiver-mediated approaches.² One such program for EL-A infants in India is LiL' STEPS— Supporting Early Social Communication and Language by Promoting Caregiver Sensitive Responsiveness (STEPS), developed by the Language Development & Intervention Lab (LiL'). While the program's feasibility and acceptability have been established,³ its preliminary efficacy in improving caregiver and infant outcomes has yet to be evaluated. This evaluation is critical before progressing to a resource-intensive definitive randomized controlled trial (RCT).

Objectives: We aimed to evaluate the preliminary utility of the LiL' STEPS program for EL-A infants by examining changes from baseline to post-intervention in caregiver sensitive responsiveness (primary outcome), and a range of caregiver and infant measures, compared to care-as-usual (CAU).

Methods:

Families of 36 EL-A infants were randomized (2:1 ratio) into LiL' STEPS (n=24, age:11.62±1.99 months, 8F) and CAU (n=12, age:11.73±2.32, 7F). Fig-1 contains the CONSORT diagram. Participants were primary caregivers of 9-15-month infants with an older autistic sibling. Caregivers spoke either Kannada, Hindi or English and had access to basic technology including smartphones and internet connectivity. LiL' STEPS, a manualized caregiver-mediated early support program, was delivered via Zoom using video feedback and live demonstrations for 12 weeks comprising 14 sessions. It is based on NDBI principles, focusing on caregiver sensitive responsiveness, infant social-communication and language. Outcomes were assessed at baseline (before group allocation- T1) and post intervention (T2). The primary outcome, caregiver sensitive responsiveness, was a blinded assessor-rated video coded measure on the MACI. Secondary outcomes included a range of caregiver reported and video coded measures assessing infant social-communication and language (e.g., MCDI, CSBS). See Table-1. Additionally, parent stress was evaluated using the parent stress scale. Trial registration: CTRI-REF/2022/06/055249.

ANCOVAs, adjusting for infant age at T2, and corresponding pre-randomization baseline variables was used to measure pre-to-post intervention outcomes. For MCDI, Quade's ANCOVA adjusting for age and baseline values was used as the data did not meet the assumptions.

Results: Groups were matched on key demographic variables (age: $t=-0.14, p=0.884$; sex: $\chi^2=2.06, p=0.151$; parental education $t=0.26, p=0.941$). Post-intervention, there were significant differences between groups on sensitive responsiveness ($F=13.03, p=.001$, effect size $\eta^2=.31$, 95%CI=0.06-0.52), psychological stimulation ($p=.047$), dyadic mutuality ($p=.014$), and infant attentiveness ($p=.016$) on the MACI. See Table-1 for complete analysis. These findings suggest preliminary utility of LiL' STEPS in EL-A consistent with previous studies^{4,5}

Conclusions: LiL' STEPS is the first manualized program for EL-A infants in India, and this feasibility RCT has clearly demonstrated significant positive impacts on both caregiver and dyadic outcomes with some difference in infant outcomes, highlighting a need for video coded measures. These promising results, along with findings from a recent in-depth study of the program's feasibility and acceptability through parental interviews,³ underscore the potential of LiL' STEPS to address critical developmental needs. A future definitive RCT is strongly recommended to further validate these outcomes and expand the program's reach.



226.002 Clinical Effectiveness of a Post-Diagnostic Psycho-Educational and Psycho-Therapeutic Programme for Caregivers of Children Newly Diagnosed As Autistic: A United Kingdom Parallel, Single-Blind Randomised Controlled Trial (REACH-ASD Trial)

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Background:

Caregivers can experience significant challenges following their child's autism diagnosis and often seek informational, relational and emotional support (Legg & Tickle, 2019). They can experience poor mental health within the post-diagnostic period and on an ongoing basis. UK best practice guidelines recommend post-diagnostic family support. However, provision is patchy, largely unevidenced, and a source of dissatisfaction for families and professionals. Empower-Autism is a new group-based, manualised, post-diagnostic programme combining autism psycho-education and psycho-therapeutic components based on Acceptance and Commitment Therapy to support the mental health, wellbeing, and adjustment of caregivers of newly diagnosed autistic children.

Objectives:

To evaluate the clinical effectiveness of the Empower-Autism programme over usual care on caregiver mental health (primary outcome) and a range of other caregiver, family and child secondary outcomes

Methods:

We conducted a pre-registered (ISRCTN 45412843) prospective multi-centre two-parallel-group randomised controlled superiority trial (REACH-ASD Trial) of the Empower-Autism programme plus treatment-as-usual versus the usual local post-diagnostic offer plus treatment-as-usual. Empower-Autism consisted of five 3-hour group-based sessions delivered via videoconferencing. Treatment-as-usual was any locally-available group-based post-diagnostic psycho-education offer. Participants were recruited from 11 North-West England autism diagnostic/intervention centres and were primary caregivers of children aged 2-15 years given an autism diagnosis within last 12 months. Exclusion criteria: insufficient English, significant learning disability, hearing/visual impairment or psychiatric condition in caregiver; significant current family safeguarding concerns. Individual randomisation with 2:1 ratio (intervention/TAU) and stratification by centre. Primary outcome was caregiver mental health (General Health Questionnaire-30) at 52-weeks. Secondary caregiver-focussed outcomes included autism knowledge, wellbeing, adjustment, parenting stress and self-efficacy, and psychological flexibility at 12-, 26- and 52-week follow-up. Secondary family and child outcomes including parent-child relationships, family wellbeing and child functioning and emotional and behavioural difficulties at 52-week endpoint. Investigators were masked to group assignment; participants were not. Adverse events were monitored. Primary analysis followed intention-to-treat principles using linear mixed models with random intercepts for group membership and repeated measures.

Results:

The CONSORT diagram (Figure 1) presents the numbers referred, eligible, consented, randomised, and retained. 379 participants were recruited between September 2020 and April 2022 (255 intervention/124 treatment-as-usual; 88% female; 83% White). In the available case analysis (n=319), participants randomised to Empower-Autism had improved mental health at 52 weeks compared to TAU (mean difference -4.95 [95% CI: -8.21, -1.68], p=0.003). We also observed significant improvements in secondary outcomes of caregiver wellbeing (mean difference 2.66 [95% CI: 0.7, 4.62], p=0.008), adjustment (0.1 [95% CI: 0.02, 0.17], p=0.016), autism knowledge (0.74 [95% CI: 0.01, 1.46], p=0.046) and family wellbeing (-4.97 [95% CI: -8.75, -1.19], p=0.01). Other secondary outcomes showed no clear difference between arms. Figure 2 shows a forest plot of effect estimates on available data at 52-week endpoint. 181 adverse events (116 intervention/65 TAU) and 15 serious adverse events (9/6) were reported; none related to the study intervention.

Conclusions:

This is the first fully-powered randomised trial to show a statistically- and clinically-significant effect on mental health and wellbeing in caregivers of autistic children. We recommend programmes like this to clinical teams and policymakers.



226.003 A Randomised Controlled Trial of the PASS Plus Intervention for Young Children with Autism Spectrum Disorder in New Delhi, India: Findings from the COMPASS Trial.

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Background: Autism Spectrum Disorders (ASD) affects at least 5 million children in South Asia. The vast majority of these children are without access to evidence-based care which is restricted to urban child development centres and delivered by specialists. To address barriers to care, we systematically adapted and expanded the UK Pre-school Autism Communication Therapy (PACT) for non-specialist provider delivery in community settings and piloted the resulting 'Parent-mediated Autism Social Communication Intervention for non-Specialists Plus' (PASS Plus). This presentation will share the results of a definitive randomized controlled evaluation of PASS Plus (the COMPASS trial) in New Delhi, India. **Objectives:** To evaluate the effectiveness of a non-specialist community-based delivery of a parent-mediated intervention for ASD in an urban setting in India.

Methods: The Communication-centred Parent-mediated treatment for Autism Spectrum Disorder in South Asia (COMPASS) trial was a pre-registered two centre, two arm single (rater) blinded random allocation parallel group study of the PASS Plus intervention in addition to treatment as usual (TAU) compared to TAU alone embedded in the India health system (ISRCTN ID: 21454676). Recruitment was from two tertiary care government hospitals in New Delhi, India. 7 Accredited Social Health Activists, health system frontline workers were trained through a task-sharing model to deliver the PASS Plus intervention at home. They were supported by 10 project based non-specialists with similar characteristics to ensure trial timelines were met.

Results: 261 parent-child dyads were recruited into the trial with 130 randomised into the intervention arm. 18% of children were female and 48% minimally verbal. 98 sessions were evaluated for treatment fidelity of which 90% passed. Retention rates for the primary endpoint evaluated at 9 months was 83% and 84% for the follow-up at 15 months. The primary outcome is autism symptom severity measured through the Brief Observation of Social Communication Change (BOSCC). Secondary outcomes include parent-child communication and dyadic change, child adaptation, quality of life and parental wellbeing. Primary analysis will follow intention-to-treat principles and will be presented to the Trial Steering Committee in December 2024. Figure 1 illustrates the CONSORT for COMPASS

Conclusions:

COMPASS is the largest trial to date for ASD in a low-and-middle income country setting, with several innovations: the systematic adaptation of an evidence-based intervention developed in a high income setting for delivery by frontline health workers with no prior exposure to autism; an adaptation process which retained all the key mechanistic underpinnings of the original intervention; and the delivery of the intervention in the community, supporting families to overcome barriers of access. If found to be clinically effective, even in comparison to the highest quality of care available for children with ASD in India, this trial will offer evidence on the scaling up of a low-cost intervention for ASD.



226.004 CST Canada: Evaluation of a Multiphase Platform to Increase Access to Early Intervention in Community Settings

M. Elsabbagh¹, A. Yusuf¹, M. Ghanadzade², **M. Habra³**, N. J. Wright⁴, R. Bedford⁵, K. Hudry⁶, E. O'Connor⁷, J. L. Scora⁸, S. Y. Shire⁹, P. Dixon¹⁰ and T. W. CST Team¹⁰, (1)Neurology and Neurosurgery, McGill University, Montreal, QC, Canada, (2)McGill University, Montreal, QC, Canada, (3)RI-MUHC, Montreal, QC, Canada, (4)Department of Psychology, Manchester Metropolitan University, Manchester, United Kingdom, (5)University of Bath, Bath, United Kingdom, (6)Department of Psychology, Counselling and Therapy, La Trobe University, Melbourne, VIC, AUSTRALIA, (7)La Trobe University, Melbourne, Australia, (8)Special Education and Clinical Sciences, University of Oregon, Eugene, OR, (9)Autism Speaks, Washington D.C., MD, (10)Department of Mental Health and Substance Abuse, World Health Organization, Geneva, Switzerland

Background: WHO Caregiver Skills Training is a manualized, caregiver-mediated, evidence-informed intervention that integrates active ingredients of early intervention with a validated and scalable delivery mechanism. Its delivery through the Cascade Training Model ensures scalability across diverse settings, including resource-limited settings. In 2017, our research team introduced CST to Canada by launching the CST-Canada platform, a multiphase initiative aimed to overcome long-standing challenges in equitable access to early intervention. This abstract presents the outcomes of this platform, which supports the phased adaptation, implementation, and evaluation of CST in Canadian communities, positioning it for national scale-up.

Objectives: We report findings across three phases of the CST-Canada platform: (1) translation and adaptation of CST to the Canadian context through co-design with key stakeholders, (2) establishment of a national network of Master Trainers (MT) and capacity-building through professional training, and (3) implementation of a pragmatic feasibility RCT to evaluate CST delivery.

Methods: Each phase leveraged the CST-Canada platform's integrated approach to tailor methods and outcome measures. In the formative Phase 1, focus groups (clinicians, decision makers, and caregivers) informed the contextual, cultural, and linguistic adaptations of CST for Canada. In Phase 2, the platform facilitated capacity-building by training 26 professionals while engaging decision-makers in programme implementation and evaluation. Feasibility metrics focused on programme acceptability, participant retention, and fidelity of delivery. In Phase 3, the platform enabled the national delivery of CST to caregivers of children with suspected or diagnosed autism or other neurodevelopmental conditions, as part of a feasibility RCT (ISRCTN58638141).

Results: **Phase 1:** Key themes from focus groups will highlight the acceptability of CST, with adaptations ensuring relevance within the Canadian context. **Phase 2:** Of the 26 professionals (demographics) participating in the MT training, 17 (65%) completed the program. Moderate reliability in fidelity was achieved for 56% of participants, with additional fidelity data to be reported. Fidelity challenges and their implications for future training iterations will be discussed. **Phase 3:** Five community service providers across five sites formally partnered on the feasibility RCT, facilitating recruitment and CST delivery. Preliminary findings focused on key feasibility indicators, including recruitment of a representative sample, engagement of all sites in the recruitment process, retention of families, and adherence to the intervention. Analysis of primary outcomes from 80 families enrolled in the RCT is ongoing.

Conclusions: Our phased implementation of CST in Canada through the CST-Canada platform demonstrates that engagement, partnership, and the integration of research can drive both scalability and knowledge building. Our findings indicate that the CST-Canada platform holds promise for reaching under-served families and demonstrating promise CST as a scalable community-based program. With ongoing feasibility analyses and plans for a fully powered RCT, the CST-Canada platform has the potential to transform early intervention delivery at a national scale.

Panel Session

227 - Translational Bridges across the Autism Spectrum: Multi-Level Approaches to Understanding Heterogeneity across the Lifespan and Range of Functioning

Panel Chair: Karen Pierce, *Autism Center of Excellence, Department of Neurosciences, University of California San Diego, San Diego, CA*

Discussant: Alison Singer, *Autism Science Foundation, New York, NY*

Autism Spectrum Disorder (ASD) is characterized by significant heterogeneity at both behavioral and biological levels. Despite this variability, autism research and standard treatment often overlook the need to establish subtype profiles a priori to optimize interpretation of findings and intervention outcomes. Precision medicine approaches—interventions tailored to individual subtypes—could represent a critical advancement for individuals with ASD, yet such strategies have not yet materialized. Achieving this goal requires a comprehensive understanding of autism's diversity across multiple biological and behavioral dimensions and developmental periods, along with clarity on how subtypes overlap but are also distinct. This panel features four unique presentations that address this challenge head on by presenting data that connects to dots from computational to animal and in-vitro modeling to direct tests at large-scale starting from early development. The panel integrates work across a wide range of multidisciplinary approaches that includes longitudinal clinical, eye tracking, genomics, neuroimaging, and cortical organoid studies.

Introduction

K. Pierce, *University of California San Diego*

227.001 Molecular and Neural Biology Underlying Profound, Moderate, and Mild Autism Social Subtypes: Embryonic Beginnings and Toddler Age Outcomes

E. Courchesne¹, J. Zahir², K. Pierce³, V. Taluja⁴ and K. Duan⁵, (1)Neuroscience, Eric Courchesne, San Diego, CA, (2)Autism Center of Excellence, UCSD, San Diego, CA, (3)Autism Center of Excellence, Department of Neurosciences, University of California San Diego, San Diego, CA, (4)Neurosciences Graduate Program, UC San Diego Autism Center of Excellence, La Jolla, CA, (5)UC San Diego, La Jolla, CA

Background:

Social affective and communication symptoms are central to ASD, yet their severity differs across ASD toddlers: Some with mild autism display improving abilities across early-ages and develop good language skills and social relationships, while others with profound autism have persistently low social, cognitive and adaptive skills, may be minimally-verbal, and require lifelong care. How these opposite social subtypes and developmental trajectories differ at a biological level is unknown but is essential to know if the field is to develop effective interventions. The biology of those with severe autism begins in embryonic life, and it is therefore particularly important to study their biology at the earliest ages, leveraging technologies such as brain cortical organoids (BCO methodologies modelling developing cerebral cortex).

Objectives:

- Identify embryonic autism BCO subtypes and their relationships to toddler-age phenotypes
- Discover replicable early-age autism social subtypes by leveraging multimodal data
- Determine whether profound, moderate, and mild autism social-biological subtypes occur at both embryonic and toddlers ages and across cellular, molecular, social anatomic, social functional, social behavioral and social clinical levels
- examine clinical change over time in discovered subtypes

Methods:

We conducted five studies totaling 2,126 ASD, typical and delayed 1 to 3-year-olds. Study 1 analyzed molecular, cellular and growth of embryonic BCOs from 10 ASD and 6 controls and replicated findings. N=4,910 BCOs were measured in total, averaging 196 BCOs/child. BCO relationships to toddler phenotypes utilized N=266 to N=1,902 ASD and typical normative data values. To gain further foundational biological knowledge of multi-level autism subtypes, four data-driven multimodality subtyping studies used Similarity Network Fusion that combined **within-child** social and language clinical scores with biological measures: embryonic gene pathway activity (n=363, Study 2), social fMRI activation (n=179, Study 3), social eye tracking (1,259, Study 4), and social MRI anatomy (n=309, Study 5, not in Fig 1). Subtyping results were statistically validated using multiple methods such as examination of subtype separation followed by t-tests for statistical significance.

Results:

Results revealed consistently found three autism subtypes: profound, moderate, and mild autism social-biological subtypes. These were present across different cohorts and modalities and span embryonic, gene expression pathways, social cortex anatomy, social brain activation, social eye tracking, and social clinical (**Figure 1**). Compared to mild autism, profound autism displayed enlarged embryonic brain cortical organoids correlated with severe social symptoms (**Figure 2**); disrupted cell proliferation and differentiation; dysregulation in gene pathways controlling proliferation and differentiation; reduced social brain responses; reduced social attention; severely reduced cognitive, language and social IQ, and enlarged social and language cortices.

Conclusions:

Collectively, our results suggest social deficits and profound, moderate, and mild subtypes in autism begin with embryonic dysregulation of cell proliferation, differentiation, and migration. These embryonic dysregulations cause a cascade of progressive multi-level disruptions running through social cortical to social neurofunction to social attention to clinical social, language and cognitive development. Temporal and occipital cortices are dysfunction epicenters. Profound autism is distinctive because its embryonic origins, which are predictive of later social symptom severity, involve the most extreme molecular and cellular dysregulations.



227.002 Eye Tracking Derived Subtypes Reveal Associations with Clinical Phenotype and Early Brain Development Profiles

K. Pierce¹, E. Lunkova², V. Taluja³, V. H. Warnakulasooriya Fernando⁴ and E. Courchesne⁵, (1)Autism Center of Excellence, Department of Neurosciences, University of California San Diego, San Diego, CA, (2)Neurosciences, UC San Diego, La Jolla, CA, (3)Neurosciences Graduate Program, UC San Diego Autism Center of Excellence, La Jolla, CA, (4)California State University San Marcos, San Marcos, CA, (5)Neuroscience, Eric Courchesne, San Diego, CA

Background:

What a toddler chooses to look at and listen to influences early brain development through experience-dependent mechanisms. While difficulties in attending to and reacting to the social world are common in ASD, symptoms vary widely in nature and degree. Attempts at quantifying social heterogeneity at the time of first diagnosis and understanding the impact – both on clinical phenotype and brain development- of children with vastly different social attention profiles is lacking. Eye tracking (ET) technology offers objective, quantitative metrics of social visual and auditory attention. Using our novel battery of five ET tests, we have demonstrated that levels of social attention can accurately predict diagnosis in toddlers with ASD, achieving PPV and specificity between 81-100%. Here, we advance the use of ET technology to characterize heterogeneity in social attention.

Objectives:

(1) Leverage ET as a tool to quantify social attention levels and to examine consistency of responding across different eye tracking tests; (2) examine relationships between levels of social attention and clinical phenotype and brain function

Methods:

Using the *Get SET Early* model as the recruitment strategy, 2,489 toddlers (N=1,191 ASD; 616 TD; 682 non-ASD delays) participated in 1- 5 visual and/or auditory social attention ET tests (**Figure 1**), clinical testing (ADOS, Mullen and Vineland) and some (~400) participated in fMRI and were exposed to child-friendly stories through headphones during natural sleep. 223 toddlers (169 ASD; 54 Non-ASD) completed all 5 ET tests and consistency of social attention levels examined. Areas of Interest (AOIs) were created to calculate the percentage fixation on social AOIs across each ET paradigm. Within the sample of 223 toddlers, 19 toddlers with ASD also participated in fMRI and % signal change in frontal and temporal regions calculated. Associations with clinical phenotype and fMRI activation analyzed.

Results:

Preliminary analyses revealed that within the larger sample of 1,191 ASD toddlers, clinical test scores such as Mullen expressive language subscale were significantly correlated with social attention levels ($r = .27-.42$ depending on the test, all $p < .05$). Among the 169 toddlers with ASD who completed all 5 ET tests, three distinct social attention profiles were revealed: (1) Low social attention - fixation on social images $< 50\%$ across all tests; (2) Best social attention - fixation on social images $> 50\%$ on all tests; and (3) Mixed social attention. ASD toddlers in the Low Social Attention subtype had the most severe social symptoms and lowest language and adaptive scores compared to other subtypes (all $p < .05$). A significant correlation with levels of percent signal change in frontal ($r = .48$), and a trend in temporal cortex ($r = .33$) was also found, underscoring possible social attention-brain development mechanisms. **Figure 2.** Analyses with the larger dataset are ongoing.

Conclusions:

Eye tracking is a technology that objectively quantifies social attention levels. Because it can be implemented quickly and requires minimal training, it has significant potential to transform ASD clinical understanding and care. Combined with social fMRI activation, eye tracking results enhance our understanding of ASD social-biological subtypes, paving the way for precision medicine—interventions tailored to each individual child.



227.003 Electrophysiologically-Defined Excitation-Inhibition Autism Neurosubtypes

M. V. Lombardo¹ and N. Bertelsen², (1)Laboratory for Autism and Neurodevelopmental Disorders, Italian Institute of Technology, Rovereto, Trento, Italy, (2)Center for Neuroscience and Cognitive Systems, Laboratory for Autism and Neurodevelopmental Disorders, Istituto Italiano di Tecnologia, Rovereto, Italy

Background:

Excitation-inhibition (E:I) imbalance has long been considered one of the primary neurobiological theories explaining autism. However, the theory has been bolstered heavily by research on high-penetrance genetic mechanisms which are only found in a small proportion of the autism population and can manifest with potentially different directionality. Thus, a natural extension of this theory would be to test the theory and whether it manifests in a heterogeneous manner in the larger population of idiopathic autistic individuals.

Objectives:

To derive an EEG-based biomarker that is sensitive to underlying E:I imbalance and then apply the biomarker to EEG data on autism for the purpose of neurosubtyping.

Methods:

To derive an EEG-based biomarker sensitive to E:I imbalance, we first employed *in-silico* modeling of a leaky integrate-and-fire point neuron network that has recurrently connected excitatory (E) and inhibitory (I) neuronal populations. We systematically manipulated ground truth synaptic conductances (*g*) in the model over a range E:I ratios and then synthesized realistic EEG and local field potential (LFP) data as output. From the simulated LFP and EEG data we computed a statistical descriptor of fractal long-memory characteristics of the neural time-series, known as the Hurst exponent (*H*). We then evaluated how *H* behaved over the systematic manipulations of synaptic E:I conductance *g*. Directional predictions from these *in-silico* simulations were then tested and validated on *H* computed from LFP data measured from *in-vivo* causal chemogenetic DREADD experiments that manipulated E:I balance in mice. Scaling up to human patients, we also evaluated *H* computed from resting state EEG data measured in male idiopathic autistic patients (*n*=286, 5-21 years) from the Child Mind Institute Healthy Brain Network (CMI-HBN) dataset. Stability-based relative clustering validation was used on EEG *H* data to test whether replicable E:I-derived subtypes could be identified. Subtypes were compared to a typically-developing (TD) age-matched group of males from CMI-HBN (*n*=123). Partial least squares analysis (PLS) was used to test for brain-behavioral associations between *H* and age, FIQ, SRS, and ASSQ phenotypic measures.

Results:

In-silico simulations show that synaptic E:I imbalance scales with firing rate of the network and *H* - as excitability increases, firing rate increases while *H* decreases. *In-vivo* chemogenetic DREADD experiments in mice validate *in-silico* simulation predictions - increasing excitability increases firing rates while *H* decreases. Subtyping autistic males by EEG-derived *H*, we find evidence of 2 E:I neurosubtypes that generalize in new data with 92% accuracy. Around 45% of autistic males are in subtype 1 and characterized by decreased E:I (higher *H*) than the TD group (Cohen's *d* = 0.5). In contrast, the remaining 55% of autistic males are in subtype 2, characterized by increased E:I (lower *H*) than the TD group (Cohen's *d* = 0.7). Autism E:I neurosubtypes also show differential relationships between *H* and behavioral and demographic variables consisting of age, intelligence, and autism symptomatology.

Conclusions:

This work establishes causal evidence for interpreting changes in EEG-derived *H* as an E:I-relevant biomarker and suggests that idiopathic autistic males can be characterized by opposing types of E:I imbalance with differential phenotypic relevance.

227.004 Structural Correlates of Empathy and Empathising-Systemising: Effects of Sex, Autism, and Age

M. A. Radecki^{1,2}, **L. Cecchetti**¹ and **S. Baron-Cohen**², (1)Social and Affective Neuroscience Group, IMT School for Advanced Studies Lucca, Lucca, LU, Italy, (2)Autism Research Centre, Department of Psychiatry, University of Cambridge, Cambridge, Cambridgeshire, United Kingdom

Background: It is unknown whether the relationship between brain structure and empathy – understanding others' mental states (cognitive empathy) and responding to them with an appropriate emotion (affective empathy) – can comprehensively describe differences by sex, autism diagnosis, and age. It is further unknown whether additional insights are offered by empathising-systemising (E-S), operationalised as the “D-score” or difference between systemising (understanding and creating rules) and empathy.

Objectives: Development of a comprehensive theoretical framework for individual, sex, autistic, and age differences in empathy, E-S, and their structural correlates.

Methods: We used five datasets: (1) CCC (*N* = 117, non-autistic, 18-48 years); (2) LEAP (*N* = 558, autistic and non-autistic, 6-30 years); (3) AIMS (*N* = 122, autistic and non-autistic, 18-49 years); (4) HCP (*N* = 1,096, non-autistic, 22-37 years); and (5) AOMIC (*N* = 926, non-autistic, 19-26 years). Robust linear regression across pooled datasets modelled differences in empathy (measured by the 40-item Empathy Quotient; EQ), D-score (measured by the EQ and 75-item Systemising Quotient-Revised), and brain structure (i.e. MRI-derived cortical thickness [CT] and surface area [SA] across 360 regions). Structural variables of interest were defined based on meta-analytic empathy clusters (cognitive and affective) and canonical functional networks (Fig. 1A). IQ and site were controlled for in all analyses and total intracranial volume additionally in SA analyses.

Results: Regarding individual differences in non-autistic adults across CCC, LEAP, and AIMS (*N* = 283), SA but not CT within a meta-analytic affective-empathy cluster was related to both empathy (negatively) and the D-score (positively) (Fig. 1D), mirroring the effects of somatomotor and ventral-attention SA. Regarding sex differences, females compared to males had higher empathy and a lower D-score, reflected in a larger absolute difference between empathy and systemising. Secondly, affective-empathy SA differed by sex (*F* < *M*), and this was replicated in the thousands across HCP and AOMIC (*N* = 2,022). Thirdly, affective-empathy SA mediated both behavioural sex differences. Regarding autistic differences in adults across LEAP and AIMS (*N* = 358), autistic individuals compared to non-autistic individuals had lower empathy and a higher D-score, reflected in a smaller absolute difference between empathy and systemising (Fig. 2B). Secondly, while affective-empathy SA did not differ by diagnosis, it interacted with diagnosis in relation to both behavioural variables, where the brain-behaviour relationship in autism was not present or went in the opposite direction (Fig. 2C). Thirdly, both behavioural variables but not affective-empathy SA had a sex-by-diagnosis interaction, where the sex difference in autism was not present or went in the opposite direction (Fig. 2D). Finally, regarding age differences in LEAP (*N* = 558), the D-score but not empathy had an age-by-diagnosis interaction, where the autistic difference became smaller from childhood to adulthood. Secondly, affective-empathy SA interacted with age and diagnosis in relation to both behavioural variables, where the brain-behaviour relationship changed direction with age depending on diagnosis.

Conclusions: Empathy, E-S, and their structural correlates differ by and/or interact with sex, autism diagnosis, and age. These findings should be replicated and built upon in larger and more diverse populations.



228 - Beyond Infant Siblings: Understanding the Emergence of Autism in Infants with Early Medical Risk Factors

May 3rd, 2025, 2:00 PM - 4:00 PM - 611-614

Panel Chair: Nicole McDonald, *UCLA Center for Autism Research and Treatment, Los Angeles, CA*

Discussant: Shafali Jeste, *Children's Hospital Los Angeles, Los Angeles, CA*

Much of what we know about the early emergence of autism comes from prospective studies of the infant siblings of autistic children. To extend our knowledge of how autism unfolds over the first years of life, we must expand our perspective to include infants with other factors known to increase the likelihood of autism and related neurodevelopmental conditions. The current panel focuses on infants with early medical risk factors, including infants who experienced extended NICU hospitalizations, were born preterm, and who had a low birthweight. We present data from prospective studies conducted at three independent sites across the United States that include neurophysiological (EEG) and behavioral methods to understand neurodevelopmental outcomes and developmental trajectories in infants with early medical risk, with a focus on autism outcomes. Presentations will review both parallels with infant siblings (e.g., increased rates of autism and social-communication delays), as well as unique areas of vulnerability (e.g., global developmental delays) in infants with significant medical histories.

Introduction

S. Jeste, *Children's Hospital Los Angeles, Los Angeles, CA*

228.001 Neurodevelopmental Outcomes in High-Risk NICU Graduates at Age 2

N. M. McDonald¹, **C. Ferrario²**, **S. Iyer³**, **A. H. Dickinson³** and **S. Jeste⁴**, (1)*UCLA Center for Autism Research and Treatment, Los Angeles, CA*, (2)*UCLA, Los Angeles, CA*, (3)*University of California, Los Angeles, Los Angeles, CA*, (4)*Children's Hospital Los Angeles, Los Angeles, CA*

Background: Much of our understanding of early development in autism comes from studies of infants with a family history of autism. Extending this knowledge to infants with medical histories that make autism and other neurodevelopmental concerns more likely can broaden our understanding of autism as it first emerges. This study followed children who experienced extended neonatal intensive care unit (NICU) hospitalizations and qualified for the state High-Risk Infant Follow-Up (HRIF) Program (e.g., born <32 weeks, birthweight <1500g, neurological and/or cardiovascular concerns) from ages 6-24 months.

Objectives: To better understand and explain variability in neurodevelopmental outcomes in high-risk NICU graduates, we first describe 24-month outcomes, then compare outcome groups based on earlier behavioral and brain-based data.

Methods: All infants were enrolled by 6 months, with subsequent visits at 9, 12, and 24 months (adjusted age for preterm). The current sample includes 43 infants who qualified for HRIF and had 24mo outcome data available (see Table). Measures include: Vineland Adaptive Behavior Scales-3rd Edition (Vineland-3; all ages), Mullen Scales of Early Learning (MSEL; 12mo, 24mo), and frontal alpha power (resting-state EEG; 12mo).

Results: Nearly half (48.8%) of participants were neurotypical, 32.6% had developmental concerns (e.g., developmental delays, subclinical autism), and 18.6% had autism. Outcome groups did not differ demographically (though boys marginally less likely to be neurotypical). Groups were similar across birthweight and gestational age, but infants with developmental concerns had longer NICU stays than neurotypical, $p<.001$, and autistic participants, $p<.01$. Developmental trajectories were compared across groups using Vineland-3 data. For communication ($p=.02$), daily living ($p<.001$), and socialization ($p=.04$), differential trajectories were identified by outcome, with the neurotypical group staying relatively stable, while the autism and developmental concerns groups showed greater deviations from the norm over this period (see Figure). Motor skills were more stable over time, with the developmental concerns group showing consistently lower scores ($p=.002$). Verbal skills on the MSEL were consistently lower in the developmental concerns and autism groups from 12-24 months, $p<.001$, while nonverbal skills diverged from the neurotypical group over this period, $p<.03$. Neurotypical children had higher 12mo frontal alpha power than those with developmental concerns, $p<.05$. The autism group had lower mean 12mo frontal alpha power than the neurotypical group, but this did not reach significance. Brain-behavior correlations were mostly non-significant, with the exception of higher frontal alpha power being associated with higher gross motor scores on the MSEL, $r(38)=.34$, $p=.03$.

Conclusions: Nearly 1 in 5 children with outcome data in our sample of high-risk NICU graduates met diagnostic criteria for autism by age 2. This rate is higher than in prior studies in similar groups (e.g., preterm) and is comparable to recurrence rates in infant siblings. While these results should be replicated in a larger sample, they suggest that autism may be under-identified in prior studies of medical-risk infants that focused less closely on autism. In line with infant sibling studies, we also observed a gradual divergence from typical expectations over the first two years, suggesting a window of opportunity for early intervention.



228.002 The Preterm Autism Phenotype: Examining Developmental Patterns Among Autism Siblings and Preterm Infants

A. Acosta, **K. Everhart** and **J. Bradshaw**, *University of South Carolina, Columbia, SC*

Background: The rate of ASD in preterm populations is approximately 4-9%, which is 2-3x higher than the general population (Angrawal et al., 2018). Approximately 20% of preterm infants exhibit the “preterm behavioral phenotype” (Johnson & Marlow, 2011), which describes behavioral, sensory, social, and attention difficulties in later childhood. Similarly, ASD siblings are at an elevated likelihood for ASD (~20%) and the broader autism phenotype (~30%). Despite similarities between the preterm behavioral phenotype and autism siblings, very few studies have compared early developmental trajectories among the two groups.

Objectives: This prospective longitudinal study compares developmental trajectories of preterm (PT) infants and infants at elevated (EL) and low (LL) genetic likelihood for ASD across the first two years of life.

Methods: Participants (N=102, n=46 female) include EL (n=26), LL (n=50), and PT (n=26; GA: 26-36 weeks) infants who were followed from birth-24 months and who received an outcome diagnosis of ASD (EL-ASD,PT-ASD) or typical development (EL-TD,LL-TD,PT-TD). At 12, 18, and 24 months, assessments of social communication (CSBS Behavior Sample; Wetherby & Prizant, 2002), early ASD features (Systematic Observation Ratings of Features of ASD, SORF; Wetherby et al., 2016), and sensory profiles (TSP-2; Dunn, 2014) were completed. Linear mixed-effects models were used to analyze the effect of age, group, and age x group interactions for each developmental domain.

Results: Of the 102 participants, 24.5% were diagnosed with ASD at outcome, including n=16 ELs (EL-ASD) and n=9 PTs (PT-ASD). CSBS models revealed a main effect of age for the CSBS-Social ($F(1,147.56)=9.26, p=0.002$) and CSBS-Speech ($F(1,154.25)=14.92, p<0.001$), but not CSBS-Symbolic ($p>0.05$), and a main effect of group for CSBS-Speech ($F(4,170.45)=2.46, p=0.04$; [EL-ASD and PT-ASD < EL-TD,LL-TD,PT-TD]). There was a significant age*group interaction for all CSBS composites, with TDs showing greater score increases compared to both ASD groups (Fig 1). EL-ASDs and EL-TDs were largely similar at 12 months, but significantly different by 24 months. SORF models showed no main effects (all $p>0.05$), but a significant age*group interaction was present for the social communication domain ($F(4,79.55)=3.09, p=0.02$) and overall composite ($F(4,82.05)=3.34, p=0.01$), with EL-TDs showing ASD features similar to that of EL-ASD and PT-ASD at 12 months, but not at 18 and 24 (Fig 2). Models of sensory responsivity resulted in a main effect of age for increasing sensory registration ($F(4,121.48)=5.52, p=0.02$) and avoiding ($F(1,116.86)=29.38, p<0.001$) over time and an age*group interaction for sensory avoiding ($F(4,115.41)=2.98, p=0.02$), with the PT-ASD showing more sensory registration and avoiding than the other groups by 24 months of age (Fig 3).

Conclusions: Findings reveal strikingly similar developmental trajectories of EL-ASD and PT-ASD, as well as LL-TD and PT-TD, infants from 12-24 months. Interestingly, EL-ASD and EL-TD infants were inconsistently similar at 12 months, but diverged thereafter, across developmental domains. PT-ASD was distinguished from EL-ASD only by sensory responsivity, showing more sensory avoidance by 24 months. Together, these data suggest that the preterm behavioral phenotype may largely describe PTs with ASD. Further research with larger sample sizes and on specific ASD features within the ASD groups may be useful in understanding the unique profile of ASD in PT infants.



228.003 EEG As a Predictor of Neurodevelopmental Outcomes in Infants with Low Birth Weight or Family History of Autism

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Background: Little is known about generalizability of infant neuromarkers related to increased likelihood of autism or other neurodevelopmental delays based on different risk factors such as medical complexity or familial history. Electroencephalography (EEG) is one of the promising tools for developing prognostic biomarkers related to early autism behaviors or behavioral delays as it is well tolerated by infants and appropriate for measuring both stimulus-induced and resting-state brain activity.

Objectives: To examine if EEG-based early neural markers are altered in infants with low-birth-weight medical complexity (LBW) or familial history of autism (FH) in comparison to those without elevated likelihood of neurodevelopmental concerns. We also examined if EEG markers in the first year were related to early diagnostic concerns broadly and communicative and social adaptive skills specifically.

Methods: We included infants with elevated likelihood for developing ASD and/or developmental delay based on LBW (less than 2400g) or familial history (an older sibling with a diagnosis of ASD) at 6 and 12 months of age. High density EEG was recorded while the infants watched videos with social and nonsocial stimuli. Power spectral density (PSD) at 18 channels based on the 10-20 system was calculated using the Harvard Automated Preprocessing Pipeline for EEG. At 24 months, neurodevelopmental disorder (NDD) outcomes were based on the Brief Observation of Symptoms of Autism (total score) and Mullen Scales of Early Learning (≤ 2 SD). Adaptive skills were measured with the Vineland Adaptive Behavior Scales communication and socialization standard scores. (1) We fitted a linear mixed-effects model with PSD as a dependent variable, risk group, timepoint, experimental condition (stimuli with social vs. nonsocial content), and interaction as fixed effects, and participants as a random intercept. (2) We then used similar linear mixed-effects models to examine outcome groups (NDD vs. noNDD). Correlations were used to explore relations between PSD and social and communication behaviors.

Results: See Table 1 for sample demographics, 24-month characteristics, and outcome groups. (1) Gamma power was elevated in the first year in the LBW and FH groups at central (C3/C4, $ps<.01$) and parietal (P3/P4, $ps<.06$) electrodes. (2) However, infants with 24-month NDD (compared to those without) did not have significantly enhanced gamma power ($ps=NS$), although gamma power in the NDD group was associated with communication skills at left electrodes (e.g., C3 $r=-.31$; P3 $r=-.30$).

Conclusions: Abnormal gamma power has been reported in previous studies in infants with autism family history and children with ASD and/or developmental delays (e.g., Gabard-Durnam et al., 2019; Manyukhina et al., 2022). Increased gamma power has been suggested as a metric of altered excitatory > inhibitory activity (Rubenstein & Merzenich, 2003; Sohal & Rubenstein, 2019). Our next step will be to conduct sensitivity analyses that compare gamma responses between LBW group and FH groups, and cluster-based analysis (using EEG and behavior) that may identify a bio-profile of infants with altered gamma and communicative delays. These preliminary results suggest that neural markers of NDD can be identified in the first year of life, with high frequency EEG power a promising prognostic marker.



228.004 Developmental Trajectories and Autism Outcomes in Low Birthweight Infants

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Background: Children born preterm and very low birthweight may have distinct developmental trajectories (Caravale et al, 2005; Wolfe et al, 2002), including increased rates of autism (Lampi et al, 2012) compared to peers born at term. Parsing out developmental differences in this complex population could help hone screening tools and lead to more precision interventions.

Objectives: Evaluate developmental trajectories of children born with or without elevated likelihood of neurodevelopmental conditions including autism, with a specific probe into whether autistic or non-autistic children show different trajectories depending on their likelihood group at birth.

Methods: Data were collected from 257 children as part of a longitudinal study at roughly 6-, 12-, 24-, and 36-months-old. Recruitment groups included children with low likelihood of developmental concerns (LL), or elevated likelihood (EL) based on being born LBW (EL-LBW, <2400g) or having an older autistic sibling (EL-Sib). Diagnostic outcomes and developmental assessments including the Brief Observation of Symptoms of Autism (BOSA; total score), Mullen Scales of Early Learning (Receptive Language and Visual Reception subscales), and Vineland Adaptive Behavior Scales – 3rd Edition (Social, Communication, Daily Living Skills, and Motor subscales) were analyzed. Linear mixed models of each outcome predicted by recruitment group, diagnostic outcome (ASD vs nASD), and age were analyzed using repeated measures ANOVA.

Results: Chi-square tests evaluating diagnostic outcome by group showed significantly higher rates of ASD in EL-Sibs than EL-LBW and LL groups ($p < .001$) with no difference between EL-LBW and LL. To better appreciate the nuance of developmental outcomes, we also evaluated atypical non-ASD outcomes, and only found that EL-LBW trended towards higher outcomes of atypical non-ASD diagnoses than LR ($p = .057$) (Table 1).

All models showed significant age and diagnosis*age effects ($p < .05$) (Figure 1). Autistic children most often differed from non-autistic ($p < .05$) at 24-months and older. BOSA scores were lower (fewer symptoms) in the LBW-nASD children than LL-nASD at 28-months but were higher for LBW-ASD than LL-ASD at 39-months-old ($p < .05$). Broad trends emerged of LBW-nASD scoring lower on developmental measures than LL-nASD, especially at older timepoints. Among varied significant differences on the Vineland-3, the Sib-ASD group scored lower than LL-ASD—and occasionally LBW-ASD—at various ages in Social, Communication, and Daily Living Skills ($p < .05$), and LBW-ASD scored significantly higher than LL-ASD in the Social subscale at 14-months.

Conclusions: Amid myriad significant differences between recruitment and diagnostic groups across ages, a pattern emerges where non-autistic EL-LBW children show pervasive vulnerability to developmental deficits by 28-months-old compared to non-autistic LL children; however, they do demonstrate lower levels of autism symptoms than LL-nASD peers at 2-years-old. This pattern may suggest that children born LBW who do not receive an autism diagnosis have a developmental trajectory that lags slightly behind other non-autistic peers, but may specifically demonstrate fewer autistic traits. EL-LBW children who do receive an ASD diagnosis also show select resiliencies compared to LL-ASD peers in the social domain, but have greater autism symptom scores by 3-years-old. Autistic children with an autistic sibling show significant patterns of greater developmental deficit than low birthweight or low-likelihood autistic children.

**Panel Session****229 - Sensory Processing in Autism: From Brainstem to Environmental Context**

May 3rd, 2025, 2:00 PM - 4:00 PM - 608-609

Panel Chair: Ryan Stevenson, *University of Western Ontario, London, ON, Canada*

Discussant: Zachary Williams, *Vanderbilt University, Nashville, TN*

The study of sensory processing in Autism has exploded in the past decade after being incorporated into diagnostic criteria. The importance of sensory processing as a fundamental building block upon which most, if not all, cognitive functions rely has become apparent. Sensory differences in autism have now empirically been shown to have a cascading impact on multiple facets of Autism, including both social communication and restricted interests and repetitive behaviours. This panel will present groundbreaking research across the hierarchy of sensory processing levels, from auditory processing in the brainstem, EEG responses to speech stimuli in infants at high risk for developing autism, and from behavioural measures of audiovisual integration to examining the role that environmental context (i.e. location, who you are with, control) has on the perceptual experience of sensory information and the responses to sensory inputs using ecological momentary assessments and qualitative measures. At each level of analysis, we will relate these sensory characteristics to the development of cognitive processes impacted by Autism, including speech and language abilities and development. This panel will highlight the ubiquity of sensory differences across the processing hierarchy and across development, and the cascading downstream effects of sensory differences at each processing level.

Introduction

R. A. Stevenson, *University of Western Ontario, London, ON, Canada*

229.001 Brainstem Mediated Physiological and Behavioral Measures of Responsivity across Development in Autism

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Background:

Autistic children and adults experience a range of sensory differences including hyper- and hypo-responsivity. We have hypothesized that auditory sensory issues may be related to delays in auditory brainstem maturation in autism, which has been structurally observed by neuroimaging and post-mortem analysis. Functionally, this delay is measured through the auditory brainstem responses (ABR), an auditory evoked potential recorded through electrodes on the scalp. Alterations in ABR latencies indicate a reduced sound sensitivity which seems counterintuitive given the increased sensory sensitivities reported by autistic individuals. Therefore, we also used a behavior measure of brainstem-mediated sensory reactivity; the acoustic startle reflex (ASR) which is an evolutionary conserved protective response to sudden auditory stimuli. It is typically quantified as the strength of an eyeblink response measured using electromyography.

Objectives:

To investigate the link between brainstem responsivity indexed via ABR and sensory issues using ASR across development.

Methods:

Autistic (n=44 kids; n= 21 adults) and non-autistic (n=57 kids; n= 26 adults) completed a hearing evaluation, an ABR recording session, and an ASR paradigm. The hearing evaluation consisted of a visual inspection using an otoscope, tympanometry (226Hz probe), and audiogram (250-8kHz). The ABR paradigm consisted of a slow click-rate (19.1clicks/second) and a fast click-rate (59.1clicks/second), and acoustic stimuli at 80 dBnHL intensity across both ears. The ASR test included responses to white noise acoustic stimuli in the range of 65–105 dB with 5 dB increments. Participants listened passively while watching a silent video.

We conducted three-way, mixed-model, repeated-measure ANOVAs with within-subject factors stimulus type (click-rate for ABR and dB level for ASR), and between-subject factors of diagnostic group and sex. Absolute latencies and amplitudes of peaks I, III and V were evaluated for the ABR.

Results:

The overall ABR waveform showed a trend towards prolongation in the autistic children relative to the non-autistic children in both click-rates (figure 1). Peak I and peak V latencies had a sex-by-group interaction in which girls had a delay in latencies. The overall ABR waveform had lower peaks for the autistic participants with more prominent differences for the autistic kids. Autistic adults had increased behavioral reactivity (figure 2).

Conclusions:

Autistic children showed a prolonged ABR waveform with increased latency of peaks I, III, and V, which is indicative of reduced speed of neural conduction. This was combined with reduced peak amplitudes meaning they have reduced neural responsivity. The differences were more severe for the autistic girls compared to the boys. In addition, they did not display any behavioral increase in acoustic reactivity. Their behavioral and physiological responses align. Their ascending auditory pathway is less responsive to sounds and there seems to be a perceptual adaptive gain to counteract the reduced responsivity.

In contrast, autistic adults have a relatively typical ABR response indicating that ascending auditory pathway development normalizes by adulthood. It is combined with increased sound reactivity as measured with ASR. This could be due to the perceptual adaptive gain in childhood becoming maladaptive as the neural responsivity of the brainstem normalizes by adulthood.



229.002 Audiovisual Multisensory Integration in Autistic and Non-Autistic Youth: Links with Language and Core Autistic Features

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Background: Sensory differences, particularly those in audiovisual integration, have been well studied in autistic children and are hypothesized to underly core- and related-features of autism, such as language, social communication, and restricted interests and repetitive behaviors (RRBs). However, the extant literature is limited by a lack of studies that (a) compare audiovisual integration in autistic versus non-autistic youth across levels of stimulus complexity (i.e., social and nonsocial) and (b) evaluate whether links between metrics of audiovisual integration and standardized clinical assessments are moderated by diagnostic group.

Objectives: This study sought to investigate multisensory integration in autistic children using a comprehensive battery of psychophysical tasks and to relate those abilities to an extensive neuropsychological battery characterizing core and related features of autism (i.e., social communication, RRBs, language).

Methods: Participants were 120 youth (62 autistic, 58 non-autistic) well-matched on gender identity and chronological age. Participants completed a psychophysical battery assessing audiovisual integration: a speech simultaneity judgment task (participants were shown the syllable "ba" with the auditory and visual tracks separated by various stimulus onset asynchronies), a task assessing perception of the McGurk illusion (participants are presented with an audio "pa" dubbed onto a visual "ka", which elicits an illusory percept of "ta" or "ha" upon integration), and a task assessing perception of the sound-induced flash illusion (SIFI; participants were shown one visual flash presented with two auditory beeps, which elicits an illusory flash percept upon integration, at a range of stimulus onset asynchronies). Participants also completed a battery of clinical assessments tapping aspects of language, social communication, and RRBs.

Results: Results of a MANOVA indicated that groups differed in their audiovisual integration, Pillai's trace = 0.173, $F(4, 115) = 6.02$, $p < .001$.

These differences were specific to perception of the McGurk illusion, ANOVA $F(1, 118) = 1.96$, $p < .001$, such that non-autistic comparison participants reported the illusion significantly more often than autistic participants, but not on any of the metrics of audiovisual integration assessed. Across groups, perception of the McGurk effect was associated with expressive language ($r = .485$, $p < .001$), receptive language ($r = .452$, $p < .001$), social communication skill ($r = .325$, $p = .005$), and the presence of RRBs ($r = .347$, $p = .003$); these correlations were robust to controlling for nonverbal IQ and correcting for multiple comparisons. None of the correlations between metrics of multisensory integration and clinical features were significantly moderated by group after correcting for multiple comparisons.

Conclusions: This study was the most comprehensive assessment of audiovisual multisensory integration and its links with clinical features in autism conducted to date. Perception of the McGurk illusion was the only metric of audiovisual integration that distinguished groups, and it was strongly linked with language and the core features of autism (e.g., social communication, RRBs) across groups.

229.003 Looking Behavior and Neural Responses to Audiovisual Speech Contribute to Language Development in Infants at Increased Likelihood for Autism

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Background: Differences in sensory processing, including looking to and processing of audiovisual speech, may cascade onto heterogeneity in language development in autistic children. Neurotypical infants have been found to predominantly look to the mouth of communication partners during the first year of life, presumably to access audiovisual cues that facilitate speech processing and language learning. Empirical support for audiovisual speech cues facilitating speech processing in children has been provided by evidence from event-related potentials (ERPs), specifically via ERP amplitude suppression in response to audiovisual versus auditory-only speech that has been linked with vocabulary in school-aged autistic and non-autistic children.

Objectives: This study evaluated the role of audiovisual speech processing in early development by determining: (a) if visual cues increase efficiency of speech processing as indexed by ERPs in infants, (b) if infants at increased familial likelihood for autism (infant siblings of children with autism; Sibs-Autism) display a lesser boost in speech processing efficiency with access to multisensory versus unisensory cues compared to infants at general population-level likelihood for autism (infant siblings of non-autistic children; Sibs-NA), and (c) if individual differences in audiovisual speech processing efficiency covary with looking to visual speech cues and emerging language ability.

Methods: Fifty-four 12-18 month old infants (28 Sibs-Autism; 26 Sibs-NA matched on sex and chronological age) viewed videos of a female speaking syllables in audiovisual (auditory speech + synchronous visual mouth movements) and auditory-only (auditory speech + still image of the face) conditions while EEG data were collected using NetStation and a 128-channel Geodesic sensor net (Net Amps 400 amplifier, Hydrocel GSN 128 EEG cap, EGI Systems Inc.). The amplitudes of the P1 and N2 components (defined a priori as occurring between 100-200 ms and 350-500 ms poststimulus, respectively) as measured at Cz were extracted from the average ERP of each participant. Participants also completed a previously developed and validated eye tracking task using an SMI Redn Scientific Eye Tracker, wherein they watched a video of a woman speaking in infant-directed speech. The proportion of looking time to the eyes and mouth were derived for analyses. Receptive and expressive language aggregates were created using the Vineland Adaptive Behavior Scales, the Mullen Scales of Early Learning, and the MacArthur Bates Communicative Development Inventory, following z score transformation.

Results: On average, infants displayed more negative N2 amplitudes in response to audiovisual versus auditory-only speech, $F(1,52) = 4.26, p = .042, \eta^2 = .040$. There were no significant group differences in ERP amplitudes (Figure 1); however, there was considerable individual variability in the degree of P1 and N2 amplitude effects in response to audiovisual speech observed. Links between looking to audiovisual speech, ERP amplitude effects, and language aggregate scores were moderated by sibling group, chronological age, and biological sex (Figure 2).

Conclusions: These findings suggest that access to audiovisual cues increases the efficiency of speech processing early in life across infants at high and low likelihood for autism. Looking to and processing of audiovisual speech may, however, differentially influence language development in these populations.

**229.004** A Mixed-Method Analysis of Contextual Factors Impacting Sensory Processing in Autistic Adults

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Background:

Autistic individuals often report negative experiences with particular sensory stimuli, commonly described as atypical sensory processing. There is a high level of heterogeneity in responses to sensory stimuli, both between individuals, but also within individuals across different contexts. While some previous research has sought to determine the contextual factors that influence sensory processing in autistic individuals, a number of methodological issues have led to inconsistent results, specifically the lack of ecological validity in many lab-based studies and recall bias in qualitative and questionnaire studies.

Objectives:

The purpose of this study was to determine the contextual factors that impact sensory processing in autistic individuals using ecological momentary assessment, an in-the-moment measure of participants' experiences, and to collect both quantitative and qualitative data on autistic individuals' sensory experiences.

Methods:

We prompted participants to complete a survey of their current sensory environment and experiences on their cellphones three times per day over the course of two weeks. The survey focused on participants' current activities, surroundings, mood, and sensory experiences. We predicted that contextual factors such as the participants' level of control over their environment, mood, and the sensory stimuli involved would affect their sensory processing. Additionally, participants completed two measures of autistic traits, the Sensory Profile and the Social Responsiveness Scale.

Results:

41 autistic adults participated in the study. Results indicated significant associations between participants' positive, negative, and neutral sensory experiences and their surroundings and other contextual factors. In particular, we found that location, being with other people, and feelings of control over the environment, good mood, fatigue, physically unwell, and anxiety/overwhelmed impacted the sensory experiences reported by participants (Figure 1). Qualitative analyses of participants' responses to open-ended questions in the daily survey revealed themes related to descriptions of their sensory experiences, their reactions to these experiences, and any coping mechanisms they used. We found no significant relationship between these experiences and their scores on standardized measures of autistic traits (Table 1).

Conclusions:

Factors such as mood, surroundings, and the modality of the sensory stimuli all contributed to differences in autistic individuals' sensory experiences. Differences were found both between and within individual reports of sensory experiences, which is consistent with previous findings. The lack of correlations between the standardized questionnaires and the proportion of sensory experiences reported as negative was unexpected and suggests a potential discrepancy between measures of sensory sensitivity and sensory reactivity. These findings help acknowledge the role that context plays in autistic individuals' sensory experiences and can have implications for creating supportive environments by controlling for different contextual factors. These findings also have implications for helping autistic individuals develop coping strategies for dealing with these experiences, such as deep breathing or wearing headphones to help reduce feelings of anxiety in situations where they have little control over their environment.

**Panel Session****230 - EEG As an Outcome Measure in the Arbaclofen Clinical Trial in ASD and the 16p11.2 Deletion.**

May 3rd, 2025, 2:00 PM - 4:00 PM - 606-607

Panel Chair: Sarah Lippe, *Neurosciences of Early Development Lab, CHU Sainte-Justine University of Montreal, Montreal, QC, Canada*

Discussant: Grainne McAlonan, *NIHR-Biomedical Research Centre for Mental Health at the Institute of Psychiatry, Psychology and Neuroscience, King's College London, London, UNITED KINGDOM*

This panel brings together international teams to explore the sensitivity and specificity of EEG in assessing the efficacy of Arbaclofen treatment for autism spectrum disorder (ASD) and 16p11.2 deletion, a genetic condition associated with psychiatric and neurodevelopmental disorders. Featuring four presentations, the panel integrates findings from three clinical trials conducted across the USA, Canada, and Europe, where identical EEG tasks were used as exploratory outcome measures. The speakers will discuss how resting-state conditions, auditory steady-state responses, and face event-related potentials (ERPs) are modified by Arbaclofen treatment in ASD and 16p11.2, and how specific EEG features—or combinations of features—predict behavioral changes. Attendees will gain deeper insights into how various EEG features converge or diverge as treatment-sensitive markers in these conditions, and how diverse statistical modeling approaches contribute to the development of efficient pipelines for enhancing the success of clinical trials.

Introduction

S. Lippe, *Neurosciences of Early Development Lab, CHU Sainte-Justine University of Montreal, Montreal, QC, Canada*

230.001 EEG Neural Functioning in Youth with the 16p11.2 Deletion: Targeting Auditory Processing and Learning with Arbaclofen

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Background:

Approximately 1% of youth with ASD have 16p11.2 BP4 and BP5 deletion syndrome (Fernandez et al., 2010). From individuals diagnosed clinically with the 16p11.2 deletion, the most common profile is impaired speech and language (~70%), with about 25% also having ASD, and most having lower IQ compared to unaffected family members (Chung et al., 2020; Männik et al. 2015). Affected individuals also have atypical white matter maturation (measured through DTI; Chang et al., 2016) and response delays in auditory cortex signaling (measured through MEG; Jenkins et al., 2016).

The L16HTHOUSE Study (NCT04271332) aims to evaluate the safety, tolerability, and effectiveness of arbaclofen in children and adolescents with the 16p11.2 deletion. This is a phase 2 double-blind placebo trial of arbaclofen with a similar protocol structure as ARBA and AIMS-2-TRIALS-CT1. L16HTHOUSE targets articulation as the primary endpoint with exploratory endpoints in EEG biomarkers that assess inhibitory and excitatory (E/I) balance during general neural functioning and auditory processing.

Objectives:

To examine EEG metrics of E/I balance in individuals with 16p11.2 deletion obtained from the Genetique des Familles Montreal research project or L16HTHOUSE clinical trial. We first examined baseline responses in the two groups to better understand neural processing in youth with 16p11.2 deletion syndrome. For L16HTHOUSE, we hypothesized that arbaclofen would increase neural inhibition reflected by decreased power in higher frequency bands (gamma), decreased aperiodic slope, and increased aperiodic offset, in line with hypotheses from AIMS-2-TRIALS-CT1.

Methods:

Youth with 16p11.2 deletion syndrome were enrolled in (A) Genetique des Familles project (n=21) or (B) L16HTHOUSE (n=29) with EEG acquired at baseline, day 36 and day 113 (n=18). In both, EEG was acquired using a 128 channel system. The Genetique des Familles project included resting state (passive movie viewing) and auditory oddball. L16HTHOUSE included resting state EEG (passive screen-saver viewing), auditory oddball, auditory steady state, and social/nonsocial videos. We matched EEG post-processing pipelines. Absolute power was extracted across the frequency range as well aperiodic offset and slope.

Results:

(A) In the Genetique des Familles project, resting state EEG of 16p11.2 del (n=21) compared to controls (n=42) included reduced gamma power on the periodic spectra ($p < .001$), but increased power on the aperiodic spectra ($p = .027$). Aperiodic offset did not differ from controls, but the exponent was significantly lower ($p = .019$). (B) L16HTHOUSE is closed to enrollment and data lock is expected Jan 2025, with analysis conducted in Feb-May 2025.

Conclusions:

Alignment of biomarker studies and clinical trial protocols in ASD with those being conducted in rare genetic syndromes with phenotypic overlap, allows for increased rigor and reproducibility of findings as well as examination of disorder specificity. On alignment the L16HTHOUSE EEG protocol with the Genetique des Familles, ARBA, and AIMS-2-TRIALS-CT1 protocols allows for comparison to comparison or larger samples of youth, assessment of neural systems that are related to behavioral heterogeneity within and across groups (e.g., auditory processing), generalizability of the arbaclofen EEG treatment response, and the unique primary behavioral treatment outcomes for each trial.

230.002 Predict Arbaclofen-Induced Behavioral Changes in Individuals with ASD Using EEG

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Background:

The ARBA Study (NCT03887676) is a double-blind, randomized clinical trial that aims to determine whether a 16-week treatment with Arbaclofen can ameliorate behavioral symptoms and alter EEG signals in children and adolescents with ASD. Participants in the ARBA-EEG study of the Canadian arm of the international trial completed EEG and clinical interviews at a baseline visit and a follow-up visit 16 weeks after starting arbaclofen treatment or a placebo. The sample used for the present analysis includes 60 participants from two research sites in Toronto and Kingston, Ontario, comprising the full EEG sample and approximately two-thirds of the data collected by the Canadian arm of the ARBA study.

Objectives:

Test if EEG can predict treatment related behavioral improvements.

Methods:

We extracted a total of 144 features from RS-EEG data, capturing elements of power spectra and signal complexity. Power features included Alpha, Beta, Theta, Low-Gamma, and High-Gamma bands and Alpha Peak Frequency (APF). Complexity measures included Low-Scale, High-Scale, and total complexity interval (CI); Hurst Exponent (Hurst); Higuchi Fractal Dimension (HFD); Katz Fractal Dimension (KFD); and Sample Entropy (SE). We also included FOOOF, which characterizes aperiodic activity in the signal in addition to periodic power spectra. FOOOF features included Exponent, Offset, Center Frequency (CF), Power (PW), and Bandwidth (BW).

With 60 subjects in our analysis, a regression model containing all EEG features would be severely underdetermined. Thus, we first conducted feature selection by applying a bootstrapped least absolute shrinkage and selection operator (BOLASSO). Following the feature selection phase, we used forward-backward stepwise regression to find a final predictive GLM for each behavioral measure. Terms from the ranked list were added to or subtracted from a base model containing treatment, sex, age, and FSIQ as predictors and DScore as the outcome. The final model was the one with the lowest Bayesian Information Coefficient (BIC).

Results:

We identified 19 measures in which models showed a significant ($p < .05$) relationship between Treatment and DScore, indicating that a treatment-dependent change in behavior could be predicted from a combination of EEG features. These included ABC Hyperactivity, Inappropriate Speech, Irritability, and Total Score; AIM Atypical Behavior, Communication, Repetitive Behavior, Repetitive Language, and Total Score; SEQ Nonsocial Context, Social Context, EP, Hyposensitivity, SIRS, Visual Modality, and Total Score; and Vineland-3 Coping Skills, IPR, and Socialization.

The number of EEG features within each model ranged from one to 12, with a median of three features per model across the four stimuli. Features were distributed across all ROIs and included APF; High-Scale, Low-Scale, and total CI; HFD; KFD; FOOOF Exponent; FOOOF Offset; Hurst; SE; and PSD in Alpha, Beta, Delta, High-Gamma, Low-Gamma, and Theta bands.

Conclusions:

We demonstrate that combinations of features extracted from RS-EEG signal at baseline can predict significant changes in behavioral symptoms. Our approach of selecting a subset of maximally predictive features from a large and diverse feature set reveals that a combination of linear and non-linear factors across multiple ROIs can serve as a highly predictive indicator of change in multiple symptom domains after a clinical intervention.

230.003 A Phase II Randomised, Double Blind, Placebo-Controlled Study of Effects of GABA Modulation on Spontaneous Neural Oscillations in Autistic Children and Adolescents

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Background:

Increasing evidence from rodent and human studies suggests the balance between excitatory (glutamatergic) and inhibitory (GABAergic) neural activity (E/I balance) is a potential biological system for autism. This E/I balance can be measured with electroencephalography (EEG), using spectral power, aperiodic metrics, and connectivity. We need increased understanding how EEG markers shift under pharmacological interventions that target E/I balance for advancing treatment development.

Objectives:

We aimed to identify the effects of the GABA_A receptor agonist arbaclofen on E/I EEG proxies in one of the first randomised controlled trials using EEG measures. We hypothesised the treatment group would show a) decreased power in higher frequencies, b) decreased aperiodic slope and increased aperiodic offset, and c) increased connectivity between timepoints compared to the placebo group (pre-registration: <https://osf.io/tbgz9>).

Methods:

123 autistic children aged 5-17 years with fluent speech were recruited into a randomised, double blind, placebo-controlled trial across several European sites (ClinicalTrials.gov ID: NCT03682978). The treatment group received arbaclofen 3 times a day (15/20mg depending on age) for 16 weeks after a 5-week titration period while placebo group received a placebo tablet at identical frequency and duration. Randomisation was stratified 1:1 with the Interactive Web Response System.

EEG was recorded before treatment and at week 16. Children passively watched 4 stimuli: videos of women singing nursery rhymes, spinning toys, abstract shapes, and a fixation cross. Absolute power was extracted across lower (6-12Hz), and higher frequencies (15-100Hz). Aperiodic offset and slope were obtained across 3-28Hz (from human studies), and 1-120Hz (from rodent studies). Global connectivity (theta and alpha) was calculated as the debiased weighted phase lag index. For each of these variables, we ran a mixed model with their difference between timepoints as outcome, with treatment as predictor, stimulus, age and normalised baseline as covariates, with stimulus and participant as varying slopes and intercepts, respectively.

Results:

The treatment group (N = 42 out of 60 randomised) displayed a significant decrease in power from baseline in the lower frequencies (Coefficient = -0.54, SE = 0.16, $p = 0.001$), whereas the placebo group (N = 47 out of 63 randomised) showed no change. Aperiodic offset and slope both increased between timepoints, but the active treatment group showed smaller increases (Offset: Coef. = 0.37, SE = 0.11, $p = 0.001$; Slope: Coef. = 0.23, SE = 0.11, $p = 0.03$) compared to the placebo group (Offset: Coef. = 0.44, SE = 0.10, $p = 0.0001$; Slope: Coef. = 0.27, SE = 0.10, $p = 0.009$). Theta connectivity decreased between timepoints in the treatment group only (Coef. = -0.007, SE = 0.003, $p = 0.04$).

Conclusions:

Our findings demonstrate that arbaclofen affects periodic oscillations in lower frequencies, aperiodic neural oscillations and connectivity in autistic children and adolescents. For the aperiodic metrics, arbaclofen resulted in smaller changes across time than the placebo. This may result from arbaclofen impacting inhibitory activity from parvalbumin (PV) interneurons – with downstream changes in neuronal activity and circuits. Future research should focus on relation to behavioural changes and potential use for treatment development.

230.004 What a GABA-B Agonist Does (and Doesn't) Do to Face Processing: Insights from a Clinical Trial in Autism

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Background: Social difficulties are a core diagnostic criterion of autism spectrum disorder (ASD), and can significantly affect the quality of life and adaptive functioning of autistic people. Face processing is critical for social interaction. N170 latency (N170L), an electroencephalography (EEG) index of face processing, is delayed in some autistic individuals and may reflect differences in neural processing during social interactions. Slower N170L is associated with greater social challenges. One proposed mechanism contributing to social differences in autism is an imbalance between excitation and inhibition (E-I) in the brain. The role of E-I balance in face processing remains unclear. Arbaclofen, a GABA-B agonist, may help restore E-I balance in autism, potentially supporting adaptive and social functioning.

Objectives: To explore 1) how N170L responds to arbaclofen, and 2) whether N170L predicts treatment response on clinical markers of social function in ASD.

Methods: In this phase II, randomised, double-blind, placebo-controlled trial, 123 autistic children and adolescents (aged 5–17) were administered arbaclofen or placebo for 16 weeks (ClinicalTrials.gov ID: NCT03682978). EEG data were recorded as an exploratory measure while participants viewed static upright faces at weeks 1 (pre-treatment; N=96) and 16 (post-treatment; N=87). We filtered, segmented, cleaned, and averaged EEG data from each trial to extract N170L. Parents provided VABS-3, SRS-2, AIM, ABC-C, and clinician-assessed CGI-I and CGI-S measures.

Hypotheses were preregistered on the Open Science Framework (OSF)[1] and tested using linear mixed models.

Results: N170L did not differ between the arbaclofen and placebo groups ($p=0.72$), and baseline N170L did not predict clinical change on any measure. In the placebo group, changes in N170L were significantly associated with changes in SRS-Social Cognition ($r=0.34$, $p=0.028$), AIM-Peer Interaction ($r=0.39$, $p=0.018$), and CGI-Improvement scores ($r=-0.51$, $p<0.001$), with slower N170L associated with greater social challenges. In the arbaclofen group, these associations were decoupled, with N170L no longer relating to clinical changes (all p -values>.075). See Figure 1 for scatterplots and boxplot.

Conclusions: N170L is not sensitive to arbaclofen over 16 weeks, nor does baseline N170L predict clinical treatment response. However, in the placebo group, changes in N170L correlate with increased social challenges, suggesting N170L potential as a marker of social functioning in ASD over short timescales. The decoupling of this association under arbaclofen may indicate that expertise in face processing, as indexed by N170L, is acquired over longer treatment durations, or through mechanisms not directly impacted by GABA-B modulation.

[1]<https://osf.io/9v7u3>



Poster Session**435 - Digital Health Research or Technology Demonstration I**

May 3rd, 2025, 10:30 AM - 1:00 PM - 6E

Supporting Autistic Adults through a Gamified Educational App*A. McGuire, K. Chapman, J. C. Xing and X. Page, Computer Science, Brigham Young University, Provo, UT*

Background: For many autistic individuals with substantial support needs, the transitional years of young adulthood (18-29) can be difficult due to reduced access to resources such as education. Coupled with limited access to transportation (Lubin, 2016) and employment (Chen, 2015), many individuals in this population may not be able to easily attend traditional educational venues. As such, it is important to understand how to better support this population in receiving an education for low cost, asynchronously, and self-paced. Prior research has found that gamification can be a beneficial mechanism for encouraging self-paced participation in various learning tasks (Camargo, 2019). However, the vast majority of the work done on education, autism, and gamification has focused solely on autistic children (Mubin, 2019).

Objectives: To develop an educational gamified platform which encourages self-paced, asynchronous learning for autistic young adults.

Methods: In order to better understand gamification mechanisms preferred by autistic emerging adults with substantial support needs, we first ran participatory design sessions with 3 autistic young adults (ages 18-29) residing at a residential facility. During these participatory design sessions, participants were exposed to common gamification styles (determined from the top games in the app store) and asked to explain why they did or did not like each one. We then deployed a survey with 6 autistic young adults (ages 18-29) also with substantial support needs at the residential facility. We used the survey to gauge their preferred user interface aesthetic (also determined from the most popular games in the app store).

Based on the game style preferred by our participants, we designed and developed an educational app. Furthermore, we designed elements to support the user experience given characteristics of our target population. This includes helping with executive functioning by avoiding multiple-step directions - the home screen displays step-by-step directives on the current educational activity. We also offer audio for all screens to assist those who may struggle or become tired of reading the content. Colors used are minimized, avoiding superfluous visuals. Also, as users complete each learning activity, they receive game rewards as an external motivator to engage with the content. The app can collect data about the student's performance which is displayed in a teacher dashboard.

Results: From our participatory design sessions we found that our participants had a preference for virtual pet and badge collection style games. These games include having a 'pet' that participants can care for, accessorize, and earn badges as the user progresses. For each educational module, participants receive an animal which they can grow as they progress in the module. At the end, they can engage in extra practice problems which allows them to collect additional accessories for that animal. Students can also retake quizzes to improve their score, earning incentives as they do. We are testing this app with a social media safety curriculum and will present this version for attendees to use at the conference.

Conclusions: This introduces a self-directed and self-motivated educational platform that can be used for emerging autistic adults.

**Integrating the Application of Cognitive Behavioral Therapy, Social Skills, and Virtual Reality for Adults with Autism and Social Anxiety**

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Background:

Social anxiety is one of the most prevalent comorbidities in individuals with autism, with an estimated 17-49% developing a social anxiety disorder. The literature indicates that this comorbidity predicts poorer treatment outcomes than either condition alone (Briot et al., 2020; Stark et al., 2022). Cognitive Behavioral Therapy (CBT) is a more recent treatment applied to individuals with autism and social anxiety (Bemmer et al., 2021; Ekman & Hiltunen, 2015; Factor et al., 2022; Wang et al., 2021). With the expansion of new technologies, therapists have incorporated advancements such as virtual reality (VR) and telehealth (Botella et al., 2000, 2007). VR has been recently utilized to treat several mental health conditions, including anxiety disorders (Castro et al., 2014). However, even with multiple treatment modalities available, individuals with autism and social anxiety face difficulties accessing programs that meet their unique needs.

Objectives:

The goal of this study was to create an adapted CBT/Social Skills/VR treatment tailored to the needs of adults with autism and social anxiety. Although research and resources have primarily focused on children, there are limited resources for adults with autism, especially those from minority groups (Maenner et al., 2020; S. White et al., 2016). Enhanced services are necessary to provide appropriate diagnostic, treatment, research, and support services for all impacted by these conditions.

Methods:

A quantitative, exploratory, two-group repeated measures design was used to assess the clinical impact of the treatment on social anxiety traits. Post-intervention measures of acceptability, feasibility, and appropriateness of the intervention were also used to evaluate the intervention and its adaptation. Adults with social anxiety face multiple barriers to accessing services, and those with autism experience lifelong challenges that exacerbate their difficulties, often leading to additional mental health conditions such as depression. Adapted treatment that addresses this population's unique needs could reduce social anxiety symptoms, positively impacting their participation in social situations. The treatment consisted of a modular program of 12 sessions, including CBT-psychoeducation, emotional awareness, social skills training, and virtual reality exposure. The virtual reality exposure was conducted using a novel virtual communicator tool using avatars and virtual scenarios.

Results:

Results indicated high levels of acceptability, appropriateness, and feasibility among participants ($n = 10$). Additionally, repeated measures ANOVA showed a reduction on social anxiety across different measures of social anxiety used before, during, and after the treatment. A total of five Liebowitz Social Anxiety Scale (LSAS) measures across treatment modules indicated a slight reduction -but not statistically significant- of social anxiety scores. In contrast, five measures of the Social Interaction Anxiety Scale (SIAS) signaled a preliminary statistically significant reduction in social anxiety scores across treatment modules.

Conclusions:

The integration of technological advancements such as virtual reality and telehealth services, combined with evidence-based practices in a culturally adapted treatment, can be accepted, appropriate, and feasible while contributing to the reduction of social anxiety symptoms in this population.

A Community Trial of Holly™ for Pediatric Populations in Naturalistic Settings

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Background: Emotion dysregulation refers to difficulties with managing the intensity and duration of feelings. Emotion dysregulation can be highly disabling for many neurodivergent children, negatively impacting opportunities for participation and inclusion, and long term physical and mental health. An important aspect of effective emotion regulation is awareness of internal states to allow for timely de-escalation of intense emotional states. To support children with awareness, we have developed holly™, a patented algorithm that uses real-time heart rate measurements from smart watches to characterize and provide a visual display of emotional arousal levels. The intended use of holly™ is as an informational tool that can increase awareness of emotional arousal states, and help children and caregivers support effective and timely emotion regulation. The holly™ algorithm has been tested in controlled laboratory conditions, demonstrating high accuracy. Furthermore, a small randomized controlled trial provided early evidence that holly can improve self-awareness of emotional states. However, it is unclear how these results translate to real-world environments.

Objectives: To evaluate the implementation of holly™ in community settings with pediatric populations.

Methods: Children, aged 4-21 with parent reported difficulties with emotion regulation, were provided a smartwatch with the holly™ app and instructed to wear it as often as they wanted to for three weeks. Parents were provided with a smartphone allowing them to review the data collected from holly™ and receive alerts indicating their child was experiencing strong emotions (high arousal level). Parents were asked to complete questionnaires after the use of holly™ to characterize usability (System Usability Scale (SUS; range: 0-100), Post-Study Usability Questionnaire (PSSUQ; range: 1-7), and a custom questionnaire), acceptance (Client Satisfaction Questionnaire (CSQ-8); range: 8-32), appropriateness (Barriers to Treatment Participation Scale (BTTPS); 44 items with 5-point Likert scale), and adoption (custom questionnaire). Descriptive statistics were computed.

Results: Of 168 families assessed for eligibility, 126 families enrolled and 70 completed the trial ($n=14$ withdrew, $n=42$ incomplete). The sample consisted of children with a mean age of 11.9 (SD=3.49 years), 65% male. Most families found it easy to learn and use the holly system (SUS mean [SD] = 66.9 [17.2]; and PSSUQ system usefulness: 3.0 [1.6]; information quality: 3.4 [1.5]; interface quality: 3.5 [1.7]). Most children found holly™ comfortable to wear (64%), liked the device (58%), and indicated they would wear holly again (57%). Themes of usability challenges identified included timeliness of data due to difficulties with wireless connectivity, difficulties with device initiation due to movement, and difficulties with interpreting arousal levels due to valence confounders. Acceptance was high (mean CSQ-8 score of 27.1 [4.4]). In terms of adoption, most families responded they would use holly™ again (56% strongly agree or agree, 26% neutral, 17% disagree or strongly disagree). Finally, most families deemed holly™ appropriate across all questions of the BTTPS (mean [SD] across items: 61% [15%] strongly appropriate, 16% [5%] appropriate, 11% [8%] neutral, 9% [5%] inappropriate, 2% [2%] strongly inappropriate).

Conclusions: The results of this community trial indicated high satisfaction and acceptability of holly™, although usability challenges were identified.

Beating the Music: How a Digital Game Protocol “Seriously” Enhanced Sensorimotor and Executive Functioning in Children with Autism

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Background:

Children on the autism spectrum display sensorimotor and executive functioning difficulties (i.e., inhibition control, cognitive flexibility), which may be linked to co-occurring timing impairments and symptom severity (social awareness, repetitive behaviors, and restricted interests). Emerging perspectives suggesting that deficits in timing may trigger a cascade of effects, influencing motor skills, repetitive behaviors, and broader social interactions in individuals with autism. “Serious games,” designed with objectives beyond mere entertainment, have gained prominence across various fields, including education, healthcare, and social awareness. These games harness the engaging nature of gameplay to facilitate learning, training, therapy, and behavioral change.

Objectives:

We validated an adaptation in autistic children of the existing *Rhythm Workers* (RW) “serious game” (previously validated in adults with Parkinson’s). We examined if rhythm-based training improves sensorimotor and executive functioning in children on the autism spectrum and how improvements related to training duration and symptom severity.

Methods:

We invited children with autism (7-13 years; n = 26) and to complete a remote longitudinal protocol. They were randomly assigned to RW or a control game with similar auditory-motor demands without beat-synchronization (active control condition). Participants played the game for 300 minutes over 2 weeks. We collected data (self-reported and logged on the device) on several feasibility measures (enjoyment, perceived difficulty) as well as social symptom severity (SRS-II). Additionally, we tested children’s rhythmic abilities with the BAASTA battery and executive functioning tasks (inhibition control, cognitive flexibility).

Results:

Our findings show high compliance with the protocol using RW and the control game (the training duration target was met), and that participants enjoyed playing both games. Those who played RW improved more in sensorimotor synchronization (Beat Tracking Index - BAASTA) and executive functioning compared to the control game. Training duration and symptom severity (SRS-II - social awareness, repetitive behaviors, and restricted interests) were strongly related to improvement in both outcomes.

Conclusions:

We validated that both the experimental and control games are well-matched and that the rhythmic game can selectively improve sensorimotor and executive functioning in children on the autism spectrum. We support more extensive training on a wider range of measures in a larger randomized control trial design. Neuro-imaging paradigms would help to examine mechanistic and longitudinal effects.



Joint Attention and 3D Motion and Depth Perception Using Virtual and Augmented Reality Techniques

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Background: Individuals with Autism Spectrum Disorder (ASD) encounter a range of challenges related to perceptual, social, motor, and cognitive skills. The development of social and communication abilities is often closely linked to the enhancement of Joint Attention (JA) skills. Additionally, many individuals diagnosed with ASD struggle with motion and depth perception, which can significantly affect their daily lives. Traditionally, various human intervention methods have been used to address these challenges. However, recent advancements in computing technology have transformed this field, introducing digital mediums as innovative intervention strategies. Notably, the combination of Virtual Reality (VR) and Augmented Reality (AR) technologies presents exciting opportunities for improved therapeutic interventions.

Objectives:

The primary objectives of this research study are twofold. First, it seeks to evaluate the feasibility of an AR and VR JA training platform designed to effectively train individuals diagnosed with ASD. Second, the study aims to explore eye-tracking data concerning the 3D motion and depth perception capabilities of participants with ASD. The research focuses on children aged 6 to 13 years. Utilizing avatar-mediated digital platforms delivered via AR and VR headsets, this study employs visual cues to enhance joint attention and subsequently compares the responses of participants with ASD to those of their neurotypical (NT) peers.

Methods:

This study comprised 19 participants diagnosed with ASD and 13 NT control participants, all aged between 6 and 13 years. All participants were in good health, and the severity of autism in the ASD group was evaluated using the Social Responsiveness Scale (SRS) and the Social Communication Questionnaire (SCQ). Each participant utilized AR and VR headsets during experimental sessions that lasted approximately 20 minutes.

The AR and VR head-mounted displays (HMDs) employed in this study are equipped with eye-tracking technology. The JA training platform features a virtual avatar alongside two objects positioned on either side. This avatar is programmed to deliver visual cues that guide participant's attention toward the virtual objects. The application records and monitors the participant's eye movements, enabling researchers to determine gaze fixations and assess whether participants are successfully focusing on the designated target objects.

Results:

In the JA study, participants with ASD demonstrated notably slower response times compared to their NT counterparts, who quickly responded to cues and maintained eye contact with a virtual avatar. Additionally, NT participants exhibited superior motion and depth perception skills, allowing them to track stimulus movement more effectively.

Conclusions:

This study evaluates the feasibility of a VR and AR training platform designed for children with ASD. It also investigates the motion and depth perception differences between participants with ASD and their NT counterparts. The findings reveal significant disparities in performance metrics between the two groups, highlighting the distinct perceptual characteristics associated with ASD.



Igait: A Smartphone-Accessible Early Screening Tool of Autism Spectrum Disorder for Children Using Video-Based Gait Analysis
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Background: Although children show clinical signs of autism early in their development, many children are not diagnosed until well into preschool years, and children from minority, low-income, and rural backgrounds are diagnosed at an even later age. Moreover, current practices designed to detect autism rely solely on parent reports and clinician observations. There is a critical need for accessible, innovative, less subjective, and more inclusive tools for early detection of autism.

Objectives: The objective of this research is to develop an easily accessible early autism screening web-based application to objectively assess children's walking gait to provide an autism index. The research is not intended to replace current diagnostic practices, but rather to offer a cost-effective, readily accessible way to screen for autism.

Methods: We created a mobile-friendly website where a user (for instance, parent of the child being screened) can upload phone-recorded videos of the child walking, along with basic demographic information, and will receive an autism likelihood index, with an interpretation guide and suggested actions, as output. We developed a machine learning (ML) model that predicts the child's score on Social Responsiveness Scale-2nd edition (SRS-2) as an index indicating the likelihood of autism, based on the child's demographic information (age, gender, height, weight, ethnicity) and several key kinematic parameters describing the child's walking gait, extracted from the 2D videos. We recruited 16 autistic, and 25 non-autistic children aged 5-12 years to collect data for training and validating the ML model, with more participants being recruited for further tests.

Gait parameters were chosen as predictors to leverage research-based evidence of significant differences between autistic and non-autistic children. OpenPose, an open-source software for posture modeling, was used to extract gait parameters from 2D videos. The ML model was built upon the Long Short-Term Memory model, a type of recurrent neural network.

Results: A prototype of the tool, called *iGAIT*, has been developed. The website is freely accessible from any mobile device and only requires a short video of the child walking, making it user-friendly for non-speaking children, multilingual children, or children showing differences in language development. By including demographic information and culture-related factors, the website can be more culturally responsive, addressing an urgent need to consider culture when assessing the development of gait in autistic children. The website can generate the autism likelihood index within 1 minute, allowing for fast screening requests from a large number of users. It also offers a visualized summary of historic records for further reference by the user and healthcare professionals. The ML model shows satisfactory accuracy on preliminary validation. Further tests and model enhancement are in progress. Figure 1 shows the user interface and the back end of the website.

Conclusions: This research has demonstrated the feasibility of early screening of autism in a fast, cost-effective, easily accessible, minimally invasive, and less subjective way. The tool lowers the barrier to autism screening services for low-income families, helping to raise autism acceptance and reduce delays in diagnosis. The research also advances gait-based health evaluation technology.



A Virtual Dental Office Experience for Children with Autism – a Randomized Controlled Trial

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Background: Dental visits can be stressful, especially for autistic children, due to sensory sensitivities and unfamiliar environments, often leading to anxiety. Traditional tools like social stories help prepare children, but they have mixed results. Virtual reality (VR), which provides immersive experiences, can provide a relatively inexpensive way to learn and practice skills in a personalized, controlled, and safe setting.

Objectives: This randomized controlled trial (RCT) aimed to evaluate the effectiveness of a VR-based intervention (360° Video) compared to a social story approach in reducing pre-visit anxiety and improving dental visit completeness in children with autism at the Holland Bloorview dental office.

Methods: The 360° Video was co-created in partnership with Holland Bloorview clients and families, clinicians, industry partner (Wellwave), and dental office and research staff. A total of 146 children with autism, ages 4–12, were randomly assigned to either the 360° Video or social story intervention group prior to their dental visits. The attending clinician assessed dental visit completeness using a five-step checklist and participant behaviour on the Frankl behaviour rating scale. The primary outcome, visit completeness, was analyzed using a log-rank test to compare the two groups. The hazard ratio (HR) and 95% confidence interval (CI) were reported to assess the relative likelihood of visit completion. Pre-visit anxiety was measured using the State-Trait Anxiety Inventory for Children (STAI-CH), as filled out by the parents. Groups were compared using independent sample t-tests and the Wilcoxon Rank Sum test.

Results: A total of 130 participants (65 in each group) completed the study. Participants had a mean age of 7.0 (SD=2.3), with 32 girls (24.6%) and majority non-white participants (n=104, 86%). The group difference in visit completion rates was not statistically significant (Hazard Ratio: 1.35, 95% CI [0.86, 2.09], $p = 0.195$). There was no statistically significant difference in the pre-visit anxiety scores between the two groups ($p = 0.74$). The difference between groups on the Frankl scale approached statistical significance ($t = 1.81$, $p = 0.072$), suggesting a trend toward more positive behavior in the 360° video group. Parents of children in the 360° group reported higher satisfaction with the tablet experience ($p = 0.006$), though not significantly different for the children ($p = 0.12$).

Conclusions: This research introduces a new tool to prepare for clinic visits and contributes to the growing evidence on the use of VR in healthcare by exploring its role in preparing autistic children for dental visits. While both 360° video and social stories showed comparable outcomes in visit completeness and anxiety reduction, VR demonstrated a trend toward more positive behaviour, suggesting potential benefits that warrant further investigation. The positive feedback from parents in the 360° group suggests that the tool is well-received and appreciated as a useful resource. This can help foster better outcomes, improving the overall healthcare experience for autistic children and their families.

ClinicalTrials.gov ID NCT05196230

Community-Based Participatory Approach to Developing a Gamified Mobile Health Intervention for Increasing Physical Activity and Reducing Sedentary Behavior in Autistic Adults

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Background: Despite the recognized importance of regular PA for overall health, a large proportion of autistic adults remain insufficiently active. Current research on strategies to enhance PA and reduce sedentary behavior (SB) in this population is limited and often lacks methodological rigor in the intervention design process. Gamified mHealth interventions offer a promising avenue for PA promotion, leveraging autistic individuals' strengths in visuospatial learning and predilection for digital gaming. Although the commercially available gamified apps show preliminary effectiveness in general populations, their long-term impact on PA and SB changes in autistic adults remains uncertain. Understanding the adoption challenges and transferability of mHealth interventions in real-world settings is essential to improve preventive health behaviors in this community.

Objectives: (1) To formulate gamification and behavior change techniques for PuzzleWalk app using a community-based participatory approach. (2) To assess the feasibility and acceptability of PuzzleWalk app in increasing PA and reducing SB among autistic adults, including those with mild intellectual disabilities (ID) in real-world settings.

Methods: Weekly participatory design workshops with seven autistic adults, one parent of an autistic adult child, and one speech therapist were conducted for 2-month to guide the development of PuzzleWalk app. Remote workshop sessions, including individual interviews and online surveys, evaluated the preferences and patterns of mobile technology use, applicable gamification and behavior change strategies to enhance user engagement and adherence, and the app's previous and current prototypes. Interview and survey findings were analyzed and incorporated into the PuzzleWalk system, followed by compatibility testing on various iPhone models. Thirty autistic adults (Mage 33.1±10.1; 80% females) recruited from the SPARK Research Match are currently participating in the 8-week field deployment study to assess the effects of PuzzleWalk app on increasing PA and reducing SB in real-world settings. Sedentary time, step counts, light PA, and moderate-to-vigorous PA are measured by ActiGraph Centropoint Insight Watches (Pensacola, FL) and user engagement (e.g., number of app login sessions and time for app use) is tracked via data server logs. Repeated measures ANCOVA will be used to examine the changes in participants' objective levels of PA and sedentary time before, during, and after the PuzzleWalk intervention.

Results: Usability beta testing revealed that nine participatory design workshop participants highly valued the app's step-tracking feature, leaderboard, and visual design, which boosted their motivation for PA engagement and fostered competition among users. Most participants felt the app helped increase PA, reduce SB, and provide a sense of achievement. Autistic traits like perfectionism and competitiveness influenced the level of engagement, sometimes enhancing motivation but also causing discouragement due to difficulty of puzzle games. Overall, the app was viewed as potentially beneficial for promoting PA and reducing SB in autistic adults. The results of the field deployment study will be provided with the live demo.

Conclusions: The PuzzleWalk app shows promise as an effective tool for enhancing both PA motivation and intervention engagement through tailored gamification and behavior change strategies. Ongoing field deployment results will further clarify the app's effectiveness and real-world applicability.



Examining Temporal Patterns of Physiologic Markers and Self-Reported Stress in Autistic Children and Their Parents in Daily Life
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Background:

Autistic children are prone to experiencing negative mental health outcomes, including stress. Their parents often experience greater stress compared to those raising children without disabilities. Parenting stress negatively affects families, increasing risks of physical ailments (e.g., cardiovascular disease) and mental health issues (e.g., depression). The temporal dynamics of children's stress and parents' stress in daily life are complex and remain largely unexplored. Mobile applications have been widely used to track daily activities and psychological health. Non-invasive wearable sensors have proven effective for ongoing physiological signal recording that may be used to extract stress markers. We proposed a data collection method using both technologies to explore the temporal pattern of both physiologic and psychological stress in autistic children and their parents in their daily lives. Understanding how these types of stress interact provides a reference for early stress detection and management, potentially mitigating physical and behavioral health risks.

Objectives:

This study aimed to 1) evaluate the feasibility of a self-reported stress data collection method by parents during daily interactions with their autistic children, and 2) explore the temporal stress pattern in autistic children and their parents.

Methods:

Figure 1 shows the framework of the proposed data collection method, with arrows indicating information flow. The framework consists of three modules:

1. Module I collects physiological data simultaneously from both the child and the parent using wearable sensors (e.g., Empatica E4 wristband).
2. Module II allows parents to report stress via a custom mobile application, securely uploading data to a database.
3. Module III synchronizes physiological signals with self-reported stress events, enabling temporal analyses.

Participating families wore the E4 wristband and recorded data for at least four days. Parents were encouraged to report stress using Module II during daily interactions.

Results:

Fourteen families participated and twelve of them completed data collection. The parents included 11 females and one male (Age (years): Avg = 44.3; SD = 6.96). All 12 autistic children were boys (Age (years): Avg = 9.33; SD = 1.96). Physiological signal analysis showed that the standard deviation of heart rate variability of both autistic children ($p = 0.04$) and their parents ($p = 0.04$) was significantly higher in periods when parents reported stressful events (Wilcoxon signed-rank test). Meanwhile, the temporal distributions of physiological stress markers in children and parents were coupled, as shown in Figure 2. While parents tended to have greater numbers of segments indicating physiological stress throughout most of the day and particularly during the mid-day period, the overall patterns and peaks tend to be synchronized. This pattern may stem from heightened arousal states associated with externalizing behavior and the emotional or physical strain on parents when managing these episodes.

Conclusions:

Our preliminary findings demonstrated the feasibility of the proposed data collection method in tracking stress in autistic children and their parents during daily life. The temporal stress patterns in children and parents seemed synchronized, revealing the importance of further analysis on the reciprocal dynamics of stress between children and their parents.



“Heels 2 Participation” Elearning Modules Toward Improving Community Participation in Young Adults with ID: Demonstration and Lessons Learned

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Background:

Adults with intellectual disabilities (ID), and autistic individuals with and without ID, have lower rates of vocational, recreational, and social activity after exiting the school system that endures into adulthood (Weiss et al., 2021; White & Forrester-Jones, 2020; Windsor et al., 2021). A significant barrier to improving participation outcomes for young adults with ID is the inability to scale up intervention programs that have shown success (Amado et al., 2013; Tint et al., 2017; Verdonschot et al., 2009) and the need for technology-driven interventions (Valencia et al., 2019). To bridge this gap, we translated our on-campus “Higher Education, Employment, and Living Success (HEELS) 2 Transition” curriculum targeting key areas of the transition to adulthood of self-management/goal setting, daily living, community safety, career, and mental health skills into web-based eLearning modules and a downloadable resource toolkit termed HEELS 2 Participation (H2P). H2P is designed to support community participation for young adults with ID, including autism, in an interactive, adaptive, and accessible web-based format that features narrative storytelling and gaming elements.

Objectives:

This technology demonstration will present the prototype for our H2P eLearning tool. Findings from qualitative research on pilot testing of H2P with young adults with ID and their care partners that informed design decisions, including functionality, usability, challenges, and content preferences will also be shared.

Methods:

Semi-structured virtual or in-person interviews were conducted with 15 dyads of young adults with ID, most (67%) who had co-occurring autism, and one care partner (a parent or family member) as part of prototyping the H2P eLearning tool to inform design decisions further. Study team members analyzed transcribed interviews to identify content preferences, acceptability, feasibility and usability (i.e., barriers and facilitators), and other emergent themes.

Results:

85.7% of young adults and 100% of care partners enjoyed using H2P. All young adults (100%) felt specific tools for goal planning and time management were helpful, most care partners did as well (92.3% and 83.3%, respectively). Preferences for eLearning content are seen in Figure 1, and show greater young adult preferences for life skills, self-management/goal setting, and mental health content compared to care partners, who reported community safety, interpersonal relationships, sexual health education and career development as priorities. Analysis of challenges in usability involved the need for speech-to-text function tools, more visual cues, and the importance of social and/or coaching support components in the learning process. Most participants liked the visuals, videos, virtual tools, and not relying on handwriting for learning. Care partners appreciated the interactivity, engaging graphics, potential for participants to return to materials and continual skill development, and the opportunity for participants to dream big for their goals.

Conclusions:

H2P is designed for use by young adults with ID, instructors, and supports to encourage attainment of individualized goals toward improved community participation. Findings from the pilot study suggest positive engagement in the eLearning modules and tools from participants and care partners, but points to continued development to improve functionality and usability. Plans for future testing will incorporate these design changes.

**Pressing Forward: Measuring Effort with a Progressive Ratio Task to Activate Music and Bubbles in Early Childhood**

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Background: The social motivation hypothesis of Autism Spectrum Disorder (ASD) posits that behaviors involving diminished attention to social stimuli (e.g., reduced eye contact, response to social sounds), commonly displayed by autistic individuals, lead to less motivation for and response to social learning opportunities (Chevallier et al., 2012). Early interventions for ASD to support learning rely on motivation for social and tangible rewards to shape behavior. However, many autistic children show modest gains after early intervention, perhaps due to individual differences in motivation. The developmental model of reward processing (Clements, Asuncion, and Nelson, 2023) deconstructs motivation and reward processing into six components, including effort, response, anticipation, and more. Effort can be studied behaviorally using the progressive ratio task (PRT), which requires progressively more input to receive rewarding output (e.g., mice pressing a lever 1, 2, 4, then 6 times to receive milk (Hodos, 1961)). We combined the progressive ratio with the classic infant mobile paradigm (Rovee et al., 1969) to create a developmentally appropriate PRT in which children press a button progressively more times to activate music and bubbles. PressMORE (pressing Measure Of Rewarded Effort) is an innovative infant- and child-friendly PRT designed to measure individual differences in effort to receive a reward. PressMORE is intended for repeat measurement in longitudinal studies to assess the development of effort, a key missing piece of the social motivation hypothesis with applications to early intervention.

Objectives: Develop a behavioral task to assess individual differences in effort in infants and children with varying abilities.

Methods: PressMORE was completed by children ages 3 to 5 years with typical development (n=29) and developmental concerns (n=9), which ranged from genetic conditions to ADHD and suspected autism. PressMORE tasks children with pressing a large red button with increasing amounts of effort (1, 2, 4, 6 presses and so on) to receive a display of bubbles and music. Effort is measured by the “breakpoint,” or the highest threshold (i.e., number of button presses) completed by the child. Caregivers completed the Social Responsiveness Scale (SRS-2 Preschool) to measure autistic traits in their child.

Results: All enrolled participants successfully completed PressMORE. A trend was observed such that for all participants, increasing age was correlated with increasing breakpoint ($r=0.28$, $p=0.09$), and this relationship appeared more pronounced in the small developmental concerns group ($r=0.63$, $p=0.06$; Figure 1). In contrast to our hypothesis, no relationship emerged between breakpoint and SRS-2 Preschool score ($r=0.0008$, $p=0.996$). Data collection is ongoing and PressMORE breakpoint data in additional autistic children will be available by April 2025.

Conclusions: PressMORE assesses, for the first time, individual differences in effort in early childhood with applications to understanding how reward processing develops and the social motivation hypothesis of autism. PressMORE demonstrated feasibility in 3-5-year-olds. Breakpoint may correlate with age and does not appear to correlate with autistic traits. Future directions include exploration of the relationship between breakpoint and developmental level, and validation of PressMORE with other hypothesized measures of effort, such as the Child Behavior Questionnaire.



The Impact of Stress on Autism: Exploring Self-Efficacy and Wellbeing with SAM the Stress Autism Mate

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Background:

Autistic adults often experience higher stress levels compared to neurotypical adults, likely due to environmental changes and social pressures, which can impair daily functioning. They frequently employ passive coping strategies like avoidance or focusing on emotions, which may exacerbate their stress. Effective coping strategies are essential for stress reduction to improve mental and physical well-being. Current treatment approaches for autistic adults typically include psychoeducation, psychosocial counseling, and stress-signaling plans. However, these plans are often not suitable due to difficulties autistic individuals have in recognizing stress. To address this gap, the Stress Autism Mate (SAM) app was developed by GGz Centraal to assist autistic adults in recognizing stress and managing it through personalized coping strategies.

Objectives:

This study aimed to qualitatively explore the experiences of autistic individuals using the SAM app and evaluate its effect on their coping strategies. The research sought to answer two main questions: (1) What are the positive and negative experiences of autistic individuals using SAM? (2) How does SAM influence their coping skills?

Methods:

A phenomenological qualitative approach was employed through in-depth interviews with autistic adults aged 16 and older who used SAM for at least four weeks. Participants were selected from the autism expertise center of GGz Centraal (Emerhese) and Karakter, an academic center for child and adolescent psychiatry. Inclusion criteria included a formal diagnosis of Autism Spectrum Disorder, treatment at one of the centers, and the ability to reflect on their SAM experience. Ten participants (six women, four men, ages 17 to 63) were interviewed either digitally or in-person. Interviews were transcribed and analyzed using thematic analysis according to Braun and Clarke's six-step framework, with coding conducted using Atlas.ti software.

Results:

Participants generally reported higher stress awareness through SAM, noting that its regular questionnaires helped them identify stress triggers and gain insight into their stress patterns. SAM's visual stress gauge and personalized coping strategies were viewed as helpful in actively managing stress. Users described feeling more in control and disciplined due to the app's structured approach. Four main coping strategies were identified through SAM use: problem-focused coping, cognitive coping, distraction, and seeking social support. Positive feedback highlighted SAM as a neutral, supportive tool that facilitated stress recognition and provided actionable advice. However, several challenges were reported. Some participants found the frequency of the questionnaires overwhelming, leading to non-completion. Technical issues, were sources of frustration.

Conclusions:

SAM appears to be an effective tool for increasing stress awareness and promoting active coping strategies among autistic individuals. The app's structured approach helps users recognize stress and apply coping mechanisms more consistently. To maximize SAM's effectiveness, future developments should focus on improving the app's personalization features, addressing technical issues, and integrating its use more seamlessly into clinical practice. Further qualitative research with a broader participant base is recommended to refine SAM and explore its applicability to other populations. SAM is freely available in 33 countries and 7 languages.

www.stressautismmate.nl

A Full-Fledged Robotic Intervention, Robot for Autism Behavioral Intervention (RABI), to Enhance the Social and Emotional Well-Being of School-Age Autistic Children

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Background:

Autism is characterized by difficulties with social interaction and communication. Treatment success lies in behavioral support, which is limited and carries high costs for families. Autistic children also have difficulty handling social stimuli, engaging with people and maintaining social relationships (social motivation theory of autism; Chevallier et al., 2012), and tend to have excessive reactivity to sensory stimulation from human-to-human interactions due to a particular form of brain hypertrophy (intense world theory; Markram & Markram, 2010). The intensity of sensory processing may be so overwhelming that these children may actively avoid interacting with humans, and instead focus on predictable features in their surrounding environment. Unlike humans, robots are operated in a predictable manner (Empathising-Systemising Theory, Baron-Cohen, 2009).

Objectives: This project develops a full-fledged robotic intervention, called Robot for Autism Behavioral Intervention (RABI), that aims to strengthen the social and behavioral skills of autistic individuals and facilitate their societal inclusion by applying science and technology. The RABI programme deploys the social robot “HUMANE”, which can communicate interactively in multiple languages, including English, Chinese, and Japanese, with facial expressions.

Methods: HUMANE is installed with RABI curriculum, which involves 12 modules, including selfcare, daily-use vocabularies, prosocial behaviors, basic and advanced emotional understanding and expression, basic and advanced conversation, narration, sexual education, anti-bullying, resilience, and vocational training. During each lesson, two social robots roleplay dramas and demonstrate appropriate social skills to learners. Children are then invited to engage in roleplay with the robots to practice the social skills. Empowered by Artificial Intelligence, the robots are programmed to respond to the learners spontaneously. Toward the end of each class, they participate in the learning activities with their human teachers, requiring them to generalize the acquired social skills to human interaction. Eventually learners discover how their initiations and responses influenced others’ behaviors.

Results: RABI’s effectiveness is empirically supported. Using an RCT approach, after 12 weeks of classes, RABI improves the narrative abilities of mild-to-moderate autistic preschoolers with normal IQ (number of clauses increased by 63.04%, proportion of complex clauses by 48%, percentages of stories with cognitive and emotional inferences by at least 30%, and number of gestures by 64.51%). These learning outcomes are maintained in the delayed post-tests and are not reported in the wait list control group. RABI improves not only spoken narrative abilities in experimental settings but also conversational skills in daily life. Indeed, RABI promotes parent–child interaction in mild-to-moderate school-age autistic children with a wide range of IQs. After 9 months of classes, RABI increases the number of conversational turns by 85.71% and the proportion of conversations initiated by the autistic children by 10%. Besides verbal skills, RABI enhances non-verbal communication such as joint attention and functional play behaviors. Even more promising, RABI has been shown to be more effective in promoting joint attention than human-based interventions.

Conclusions: The use of social robots provides autistic children with a supportive environment to learn social and communication skills. Given the empirical evidence, RABI can provide affordable and effective interventions for autistic individuals.

**Poster Session****436 - Adult Outcome: Medical, Cognitive, Behavioral II**

May 3rd, 2025, 12:30 PM - 1:30 PM - Hall 4A

436.001 Loneliness of Autistic Adults and Its Personal, Environmental, and Daily Social Correlates

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Background: Loneliness, a growing public health concern, disproportionately affects autistic adults and results in more severe consequences compared to the general population. Loneliness is a subjective phenomenon in which one perceives their social connections as unsatisfying or inadequate. Loneliness is associated with several detrimental outcomes in mental and physical health. Research on loneliness among autistic adults has been limited, particularly regarding the contributions of personal, environmental, and daily social experiences among autistic adults. Identifying factors that impact loneliness is essential for facilitating the creation of effective, individualized support strategies.

Objectives: This study used ecological momentary assessment (EMA) to examine personal, environmental, and daily social correlates associated with loneliness.

Methods: Autistic adults aged 18 and over who were not in high school were recruited. Participants completed questionnaires measuring demographic variables, loneliness, personal psychological factors, and environmental factors. The 3-item UCLA Loneliness Scale was used to assess general levels of loneliness. EMA was used to assess momentary feelings of loneliness in daily life (“How do you feel right now?”- Lonely) from “not at all” to “extremely.” We calculated the EMA loneliness score by averaging these ratings across all EMA responses for each participant. EMA also captured daily social contexts – being alone, at home, and feeling invisible. The EMA period occurred over 14 days and involved 4 semi-random assessments per day between 9am and 9pm. A total of 32 participants (Table 1 for sample characteristics) completed the study by the abstract submission, providing 1,709 EMA data points, with an average of 53 surveys completed per participant (max of 56). Data presented is part of ongoing data collection, so a larger sample size will be included at the Meeting.

Results: UCLA and EMA loneliness had a moderate and significant correlation ($r_{\text{spearman}}=0.47$, $p=0.007$). Females had higher levels of UCLA loneliness compared to their male counterparts (Cohen’s $d=0.71$, $p=0.068$). Higher social responsiveness scale scores were associated with EMA loneliness ($r_{\text{spearman}}=0.37$, $p=0.039$). Proportions of EMA responses of being alone were positively correlated with EMA loneliness ($r_{\text{spearman}}=0.35$, $p=0.050$), while feeling invisible was correlated with both UCLA and EMA loneliness. Both loneliness measures were positively correlated with levels of stress, depression, generalized anxiety, and intolerance of uncertainty. Regarding environmental factors, better neighbor relations, higher satisfaction with services, and satisfaction with physical environments were negatively correlated with both loneliness measures. Additional multilevel analysis will be presented for INSAR.

Conclusions: Our findings emphasize the pivotal role of daily experiences, personal psychological characteristics, and environmental factors in understanding loneliness in autistic adults. It should be noted that self-reporting loneliness in-the-moment via EMA may be quite different than loneliness measured by questionnaires. Daily social experiences (being alone and feeling invisible) and personal psychological factors seem to have higher correlations with EMA loneliness than UCLA loneliness, except for self-efficacy. Correlations suggest that understanding the loneliness of autistic adults through different assessment methods is crucial for providing support for their mental well-being and quality of life.



436.002 Longitudinal Associations between Social Support and Quality of Life Among Middle-Aged and Older Autistic Adults: A Cross-Lagged Panel Analysis

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Background: Autistic adults often experience lower quality of life (QoL), particularly in social and psychological well-being, compared to neurotypical adults. Improving QoL has become a critical focus for both the autistic community and researchers/clinicians. As the population ages, there will be an increased demand for both formal and informal long-term supports that maximize QoL. Among the modifiable factors that may promote QoL, multiple studies have indicated that higher quality social support has been linked to better QoL among older autistic adults. However, all these studies have been cross-sectional; thus, little is known about the longitudinal, bidirectional relationship between social support and QoL for this population.

Objectives: This two-wave cross-lagged panel study aimed to examine the longitudinal association between perceived social support and subjective QoL among middle-aged and older autistic adults (40+ years) in the United States.

Methods: Participants were 201 autistic adults ($M_{\text{age}}=52.99$, $SD_{\text{age}}=9.25$) with a self-disclosed autism diagnosis, further validated by the Autism-Spectrum Quotient-28 (98.5% met the >65 threshold). All self-reported data were collected in December 2019/January 2020 (Time 1) and again in December 2021/January 2022 (Time 2). Subjective QoL was captured by the short form of the World Health Organization Quality of Life instrument (WHOQOL-BREF) and the Autism-specific Quality of Life measure (AQOL). An overall mean score for the WHOQOL-BREF was calculated by averaging the responses to all 24 items across its four domains. A total score was computed for the AQOL. Social support was measured using the 23-item Duke Social Support Index (DSSI), which includes three subdomains: Social Interaction, Subjective Support, and Instrumental Support. Cross-lagged panel models (CLPM) were run to examine longitudinal associations between the social support subdomains and QoL measures accounting for assigned sex, Time 2 age, and perceived pandemic stress (only at Time 2).

Results: At both Time 1 and Time 2, social support subdomains were positively correlated with the WHOQOL and AQOL (see Table 1). Repeated measures ANOVA showed that subjective support marginally but significantly increased (3.29 vs. 3.40), $p=0.019$, while there were no significant changes in social interaction and instrumental support. There was also a significant increase in both WHOQOL (75.44 vs. 79.56, $p<0.001$) and AQOL (23.73 vs. 25.23, $p<0.001$) scores. The CLPM analysis revealed a bidirectional relationship between subjective support and AQOL, where each predicted the other at the subsequent time point (Figure 1a). Time 1 AQOL also predicted instrumental support at Time 2. Time 1 WHOQOL significantly predicted subjective support at Time 2, but the reverse was not true (Figure 1b).

Conclusions: In this unique longitudinal study of middle-aged and older autistic adults, findings indicate that increasing subjective social support plays a crucial role in improving autism-specific QoL, and that both autism-specific and overall QoL predict later levels of subjective social support. Further investigations are needed to evaluate how modifying different types of social support influence QoL in older autistic adults as we seek to optimize aging outcomes.



436.003 Longitudinal Characterization of Changes in Autistic Features over Time in the AIMS LEAP Cohort

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Background: The design of effective personalized support strategies across age requires us to better understand the evolution of core autistic features over time. Previous longitudinal studies have mainly reported stability in autistic core features, with only a small subgroup of autistic people exhibiting significant changes in these features over time. However, variability in autistic features varies widely between studies (with reports ranging from 10% to 50% of participants experiencing significant changes). Further research with large, well-characterized cohorts is needed to identify individual developmental profiles from childhood to adulthood.

Objectives: To describe the changes in core autistic features in a sample of 452 autistic participants (27.21% female) across diverse developmental stages from the EU-AIMS/ AIMS-2-TRIALS Longitudinal European Autism Project (LEAP; Development in children and adults – LEAP (aims-2-trials.eu)), encompassing accelerated cohorts of children (6-11 years), adolescents (12-17 years), and adults (18-30 years).

Methods: We assessed stability/change in autistic features—including social-communication differences, restrictive and repetitive behaviours (RRB), and sensory processing—using the Autism Diagnostic Observation Schedule – 2nd Edition (ADOS-2), Social Responsiveness Scale – 2nd Edition (SRS-2), and Short Sensory Profile (SSP). We calculated the difference in scores on these measures between two timepoints, ~12-to-24 months apart, and set a significant change threshold at half the standard deviation of the baseline scores. Subsequently, participants were classified into three groups: stable, increasing, or decreasing traits intensity. We then analyzed how these change groups related to sex, age, and intellectual quotient (IQ), and examined both cross-sectional correlations among symptom domains and how longitudinal change in one domain correlated with change in others. To ensure the generalizability of our findings, we employed a hold-out method (70/30 test/hold-out sample). Currently, we are expanding our analysis to include data from a third timepoint up to 7-years after initial assessment (Figure 1).

Results: In the test sample, we observed a consistent pattern across autistic features measures, with most participants (>55%) following a stable trajectory, and smaller groups showing significant changes (Table 1). No significant associations were found between changes in autistic features and age, sex, or IQ. Cross-sectionally, we identified strong correlations between the SRS Social Communication and Interaction (SCI) and RRBs sub-scale scores ($r = 0.82$; $p < 0.01$), SRS SCI and SSP total scores ($r = -0.60$; $p < 0.01$), and SRS RRBs and SSP ($r = 0.61$; $p < 0.01$). Similarly, longitudinally we identified significant associations between change in SRS subscales ($r = 0.63$; $p < 0.01$), in SRS SCI and SSP total scores ($r = -0.62$; $p < 0.01$), and in SRS RRBs and SSP total scores ($r = -0.52$; $p < 0.01$). These results were replicated in the hold-out sample.

Conclusions: Our findings demonstrate stability in autistic features in most people over time. However, smaller subgroups of individuals exhibit significant change (with ~ 25 – 40 % showing either a significant decrease or increase in differing features). Changes in autistic features were not associated with age, sex, or IQ. Identifying distinct profiles within the autistic population may inform more personalized support strategies for specific groups.

**436.004** Luck and Judgement: Analysing the Lived Experiences of Autistic Student Teachers.

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Background: While research highlights the importance of autistic and neurodivergent teachers as key facilitators of inclusive educational environments, autistic educators are more likely to leave the teaching profession than neurotypical students. Furthermore, autistic students are more likely to leave or divert from their initial course of study and face disproportionate hurdles to qualification even than their otherwise neurodivergent peers.

Previous studies examined the experiences of neurodivergent students in other professional degree programmes, such as healthcare. Yet there is a dearth of research considering the specific lived experiences of student teachers navigating both university and education placement settings throughout their programmes of study. Here we addressed this knowledge gap by using qualitative methods to understand the lived experiences of autistic student teachers.

Objectives: The overall aim of this research was to identify key barriers and enablers for autistic students in programmes leading to careers in education.

Methods: Fifteen autistic adults currently enrolled on Undergraduate or Postgraduate Education programmes in the UK participated in this study (mean age = 22 years, 10 female, 4 male, 1 non-binary). Nine students disclosed having an ADHD diagnosis in addition to being autistic. Neurodivergent consultants with relevant lived experience shaped the interview questions and interview process. Participants completed an online semi-structured interview ($n=13$) or an open-ended survey ($n=2$) depending on communication preferences. Data was analysed using Reflexive Thematic Analysis following the six phases of analysis Braun and Clarke (2022). Crucially, this method incorporated lead researcher's own neurodivergent lived experience as a methodological lens.

Results: Three key themes were generated from this data: (1) The Role of Luck – particular aspects of placement, such as school inclusivity and ethos, receipt of accessible information and commute time, were identified as being key for success but were highly influenced by luck. (2) The Role of Judgement – reactions to disclosure, stigmatizing views of neurodivergence and not fitting the 'teacher type' mould were identified as influential aspects of placement experiences that were influenced by fear of negative judgement. (3) The Role of Equity – consistency of mentoring, capacity considerations and transition requirements were identified as areas crucial for course success, but where students lacked equity of access.

Conclusions: This study builds on recommendations from previous findings that qualitative research must better understand the experiences and needs of this under-served community. Here, we extend knowledge in this area by identifying key areas for change to improve placement and educational experiences for autistic student teachers. Results highlight the difficulties autistic students experience when trying to access support to complete their degrees and move into the teaching profession. We identify ways to reduce barriers and improve the capacity of this population. Implementing these much-needed changes in key areas will support sustained, successful programme attendance, subsequent professional qualifications, and retention pre- and post-graduation. Amplifying autistic voices and experiences is key to encouraging necessary change, and the changes identified here can increase positive representation of this community within the profession.

436.005 Divided Attention Advantage in the Broader Autism Phenotype

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Background:

Adults with autism have an advantage in divided attention tasks compared to a control group (Rutherford et al., 2009). The Broader Autism Phenotype (BAP) refers to sub-clinical autistic traits that are more common in relatives of individuals with autism compared to the general population.

Objectives:

This study was designed to test for a UFOV advantage among adults with not autism diagnosis but with autism in the family (BAP), and a relationship between characteristics of autism (the AQ) and UFOV performance.

Methods:

We replicated Rutherford et al. (2007)'s UFOV paradigm, which involves perceiving central and/or peripheral targets under focused and divided attention. In the divided attention task, both targets were presented, whereas in the focused attention task, only one target was presented. Participants were 12 parents with autism in the family (Mean = 39.58 years, SD = 6.14; 3 male, 1 gender-fluid, 1 non-binary, 7 female) and 9 parents without autism in the family (Mean = 38.89 years, SD = 2.47; 5 male, 4 female).

Results:

Attention type (divided or focused) on the central task was significant, $F(1, 122) = 458.46, p < .001, \eta^2 = 0.78$, as was the AQ cutoff, $F(1, 122) = 4.24, p = 0.042, \eta^2 = 0.03$; however, their interaction was not. Parents who scored above 26 on the AQ performed more accurately (mean difference (MD) = 0.07, $p = 0.042$). There was no BAP effect on accuracy; only attention type was significant, $F(1, 122) = 433.94, p < .001, \eta^2 = 0.78$ in that model.

In the reaction time (RT) analysis, neither AQ nor attention type significantly predicted it. However, only BAP predicted RT, $F(1, 122) = 7.56, p = 0.007, \eta^2 = 0.06$ and the BAP group were faster detecting central targets (MD = -0.43, $p = 0.007$).

In the peripheral task, both attention type $F(1, 185) = 21.77, p < .001, \eta^2 = 0.11$, and AQ $F(1, 185) = 12.84, p < .001, \eta^2 = 0.06$ predicted accuracy, with those above the AQ cutoff performing better (MD = -0.054, $p < 0.001$). For BAP, only the attention type predicted accuracy, $F(1, 185) = 20.54, p < .001, \eta^2 = 0.10$, indicating no advantage of genetic-relatedness.

Attention type ($F(1, 185) = 4.00, p = 0.047, \eta^2 = 0.02$), and AQ, ($F(1, 185) = 4.85, p = 0.029, \eta^2 = 0.03$) both predicted RT. Parents were faster in focused (MD = -0.17, $p = 0.047$), and parents above the AQ cutoff performed faster (MD = -0.21, $p = 0.029$). There was a main effect of BAP on RT, $F(1, 185) = 3.92, p = 0.049, \eta^2 = 0.02$ and the BAP group was faster (MD = -0.17, $p = 0.049$).

Conclusions:

Our preliminary results support Rutherford et al.'s (2007) findings and demonstrate advantages in divided attention based on autism characteristics. Our findings suggest that autism characteristics are associated with better performance on target detection and faster peripheral target detection. However, familial history was related with the only shorter reaction times.

436.006 Medication Usage in Adults Presenting for Autism Diagnostic Assessment: A Retrospective Chart Review

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Background: Autistic individuals have high rates of psychotropic medication usage and polypharmacy (concurrent use of two or more psychotropic medications) (Jobski et al., 2017). Some research has found prescription trends to be associated not only with co-occurring psychiatric conditions, but also with gender (Huber et al., 2022). Autism is typically diagnosed in early childhood; however, some individuals (particularly women) are not identified and supported until adulthood. Late-diagnosed individuals have worse mental health outcomes, and remain an underserved population (Rim et al., 2023). Delayed diagnosis during elementary years has been associated with increased medication usage, however little is known about the impact of adult diagnosis on prescription patterns (Zuckerman et al., 2017).

Objectives: Identify patterns in psychotropic medication usage and polypharmacy in adults newly diagnosed with autism, at the time of assessment. The most prevalent psychotropic medication classes used, as well as rates of polypharmacy will be explored. We examine variables including sex and gender, as well as co-occurring mental health conditions.

Methods: We conducted a retrospective chart review of adult autism diagnostic assessments performed at Adult Neurodevelopmental Services in Centre for Addiction and Mental Health in Toronto, Ontario from Jan 2023 – Dec 2023. Of 203 assessments, 183 individuals were diagnosed with autism. Individuals with co-occurring intellectual disability were excluded. Demographic information and co-occurring psychiatric conditions, as well as prior and current psychiatric medications were collected. To our knowledge, this is the largest retrospective chart review examining adult autism diagnostic assessments in a single outpatient setting to date.

Results: Of 183 individuals who received a diagnosis of Autism, 63.9% were using a psychotropic medication at the time of diagnostic assessment. Of those using medications, 47% were using 1 medication, and 53% were experiencing polypharmacy. The most common class of medications prescribed were SSRIs (26% of participants), followed by stimulants (23%), other anti-depressants (17%) and atypical anti-psychotics (14%). Medication use did not differ by gender identity, however participants assigned female at birth were more likely to be using medications.

Medication use was associated with co-occurring ADHD, $X^2(1, N=183) = 6.854, p=.009$, anxiety disorder $X^2(1, N=183) = 9.437, p=.002$, bipolar disorder $X^2(1, N=183) = 10.572, p=.001$, and borderline personality disorder $X^2(1, N=183) = 7.273, p=.007$. Depression was not associated with medication use. Of those using medications, participants with bipolar disorder were more likely to be experiencing polypharmacy, $X^2(1, N=117) = 4.402, p=.036$. A logistic regression was performed to test whether sex, gender and co-occurring psychiatric conditions would predict medication usage. Sex assigned at birth ($B = 1.068, p=.032$), ADHD ($B = 1.104, p=.003$) and anxiety disorder ($B=.793, p=.044$) emerged as significant predictors.

Conclusions: The rates of medication usage and polypharmacy in late-diagnosed adults at time of assessment are comparable to that of the general autistic population. SSRIs were the most prescribed medication class in our late-diagnosed cohort, compared to anti-psychotics in the general autistic population. Sex assigned at birth, ADHD and anxiety disorder were identified as predictors of medication use.

436.007 Mental Health and Service Use Among Cisgender and Sexual and/or Gender Minority Autistic Young Adults

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Background: Mental health challenges are highly prevalent among autistic adults, with recent estimates indicating that up to 50% of autistic adults experience at least one psychiatric disorder. Approximately around a third of autistic adults identify as a sexual and/or gender minority (SGM), with recent work suggesting that SGM autistic adults have worse mental health outcomes compared to cisgender heterosexual (CisHet) autistic adults. This is particularly concerning given the multitude of barriers that autistic adults encounter when seeking quality mental health care. Yet, few studies have explored the intersectional impact of being both autistic and having an SGM identity related to mental health services utilization.

Objectives: This study aimed to examine participant characteristics, mental health history, and patterns of mental health service utilization among SGM and CisHet autistic young adults.

Methods: Secondary data analyses were conducted with a subset of autistic young adults recruited to a larger, measurement development and online psychometric study of the Relationship, Employment, Autonomy, and Life Satisfaction measures. SGM ($n=91$) and CisHet ($n=119$) autistic participants (18-25 years) were identified from that dataset. Self-report measures of measures of sociodemographics, mental health history, and current anxiety and depression symptoms were compared across SGM and CisHet groups using chi-square, t-tests, and regression analyses.

Results: Of 210 autistic young adults, 91 participants comprised the SGM group ($M_{age}=22.9$ years) and 119 comprised the CisHet group ($M_{age}=22.3$ years). Analyses revealed a negligible, though statistically significant, group difference in age ($p=.035$), and no group differences in race/ethnicity (78% White Non-Hispanic/Latine). The SGM group was more likely to have higher education, be in a committed relationship, and prefer 'identity-first' language concerning autism, whereas the CisHet group had less education, were single/dating, and preferred 'person-first' language to refer to autism.

Overall, SGM autistic adults endorsed significantly higher rates of mental health diagnoses ($M=3.1$) than CisHet autistic adults ($M=2.3$), $p=.003$. While both groups reported high rates of bipolar disorder, OCD, and ADHD, the SGM group was more likely to report higher rates of depression (62% SGM; 44% CisHet; $p < .001$), anxiety (88% SGM; 59% CisHet; $p < .001$), and PTSD diagnosis (39% SGM; 20% CisHet; $p=.003$). The SGM group also had greater current anxiety ($p=.005$) and depression ($p<.001$) symptoms than the CisHet group, even after controlling for age. Both groups were equally likely to be utilizing some type of mental health services, however, service type and medication used differed by group. For example, the SGM group was more likely to utilize individual therapy ($p=.01$) and antidepressants ($p=.004$).

Conclusions: Nearly half (43%) of young autistic adults identified with an SGM identity. Both SGM and CisHet groups reported significant mental health challenges yet comparable mental health service utilization. Ultimately, extending beyond efforts to support the mental health needs of both autistic and LGBTQIA+ populations, it is critical that future research identifies specific barriers to care resulting from the intersectional impact of SGM identity among autistic adults.

436.008 Modified CBT and Quality of Life for Autistic Adults

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Background: Autistic adults are at a high risk for anxiety, depression, and other mental health concerns for which cognitive behavioral therapy (CBT) is a go-to treatment (e.g., Maddox et al, 2021). Measurement of disorder-specific symptoms (such as PHQ-9 or GAD-7) may be useful in capturing change in symptoms associated with a diagnosis over time, but they do not give global information about the client's functioning. Quality of life (QoL) is an important metric in assessing therapy outcomes.

Objectives: The study sought to see whether CBT modified for autistic adults yielded positive changes in QoL ratings. The hypothesis was that mood, anxiety, and overall sense of well-being would show improvement, and only a small change was expected in social relationships. Participation in an education group, which provided opportunity for community with other autistic adults was expected to have a further modest impact on QoL scores, which they have in preliminary analyses.

Methods: At intake and sessions 4, 8, 16, and 24, therapy clients ($n = 900$) completed QoL ratings on a 5-point Likert scale. Ratings in the domains of social relationships, mood, anxiety/worry, and overall sense of well-being after different numbers of sessions will be compared to scores at intake. In addition, participants were able to self-select into education sessions led by autistic clinicians. In the education sessions, participants had the opportunity to interact with other recently diagnosed autistic adults. Multilevel modeling will be used to examine the within-subjects change from intake score over number of sessions nested within groups that participated in the education group and those who did not.

Results: Data are preliminary at the time of submission and will continue to amass until analyses are performed before the conference date. At present, 636 participants have completed baseline data and 108 participants have completed QoL ratings after the 8th session. Results will discuss: (a) descriptive statistics of the sample, (b) discussion of the data structure, (c) details on model specification and software (MILwiN), (d) justification of the multilevel analysis, (e) model estimations and assumptions. The comparison to baseline for each QoL measure will be reported, as well as information obtained about whether the change is linear over time.

Conclusions: The different trajectories of QoL change over number of CBT sessions will be discussed, as well as comparison of different aspects of QoL (e.g., mood vs social relationships). Comparison of observed QoL change with CBT in an autistic population to what is typically described in neurotypical populations will be discussed. The added benefit, if any, of education sessions will be discussed. Specific implications based on the findings and their usefulness to researchers, clinicians, the autistic community, and other stakeholders will be discussed, as will limitations and future research.

436.009 Navigating Autistic College Students' Identity Formation in Their Journey of Career Development

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Background:

Existing studies on autistic college students' experiences focus on general identity development and institutional support (Coleman, 2018; Cox et al., 2017), while limited research interrogates these students' preparedness for post-graduate employment. The current focus of career development is on individual motivation and interests (Meijers, 1998), while few studies have discussed the impact of socioeconomic environment on this population's career development.

Objectives:

Based on major critical arguments about the medical deficit-based model of interpreting autistic identity (Cox et al., 2017; Kapp et al., 2013), this study explores autistic college students' identity formation in the process of career development by examining the interplay between environmental factors and individual agencies. This research contributes to critiquing the deficit-based model of autism by highlighting structural barriers and social misconceptions for autistic students' career choices and discovering these students' agency and advocacy in seeking career support.

Methods:

Our study adopted a mixed-method design, achieving 509 valid survey responses, 43 interviews, and 35 photovoice entries (see Table 1 attached). We compared autistic students' perspectives of successful employment and students' actual achievements (0 as very unsuccessful to 7 as very successful) on topics such as "having a job as others respect" with a paired-sample t-test. We analyzed qualitative interviews to understand their explanation of career exploration and identity development at the college. The team developed codebooks and coded transcripts independently, followed by group meetings to refine codes and establish consensus to ensure consistency and transferability of the study.

Results:

Our study found that autistic students experienced social barriers when pursuing their career explorations. The t-test showed that participants rated their success in getting a respected job ($M = 4.31$, $SD = 1.54$) 1.31 points higher than the importance of this goal for college success ($M = 4.00$, $SD = 1.99$). In the follow-up interviews, participants like Orange shared that job expectations from other people contained misconceptions about the labor market and biases against the competencies of autistic students to take the role: "I stopped telling people I wanted to be an actor and I've started telling people I wanna be a psychologist, just because I get less, like 'are you sure about that' reactions?"

Correspondingly, autistic students developed advocacy identity in academic and career development when they planned to use knowledge and skills to benefit the research and practice of the autistic community. For instance, after receiving suggestions from their advisor, Jeremy decided to major in rehabilitation, since it was "more broad, flexible, and focused ... (where I can) learn more about real-life situations (about autistic youth and adults)".

Conclusions:

The paper extends the current critique of the deficit-based model of autism. Our paper explores how autistic students navigate their career development in the face of structural oppression that limits the agency needed for such development to occur. Practically, our findings encourage colleges and student services to rethink their policies and accommodations for supporting autistic students' academic and career development.



436.010 Navigating Intersectionality: Quality of Life Among Autistic Adults with Multiple Marginalized Identities

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Background:

The autistic community has identified quality of life (QoL) as a top research priority, and previous studies have shown that autistic people often report lower QoL compared to their nonautistic peers (Beck et al. 2023). Research highlights that individuals with stigmatized identities (e.g., race or gender) encounter more stressors and barriers that can further diminish QoL (Reinka et al., 2020). Autism itself is often stigmatized, yet there remains a significant gap in understanding how having multiple marginalized identities might compound these challenges. Examining this could offer valuable insights into unique stressors faces by this population.

Objectives:

To examine the relationship between holding one or more marginalized identities and autistic adults' self-reported QoL.

Methods:

Participants included 200 autistic ($n=126$) and non-autistic ($n=74$) adults (18-35y) from Wave 2 of the longitudinal GENDAAR cohort (54% assigned female at birth [AFAB], 26% Black or Latine). They completed the World Health Organization Quality of Life brief version (WHOQoL-BREF), a subjective measure of QoL in four domains: Physical Health, Psychological Well-Being, Social Relationships, and Environment. We used a linear regression model in SPSS v.29.0.2.0 to analyze the main effects and two- and three-way interactions of sex assigned at birth (SAB), autism status, and ethnoracial identity for each domain; standard errors were HC3-corrected to address heteroscedasticity concerns in models predicting Psychological Well-Being and Environment.

Results:

Physical Health. Consistent with our hypothesis, we found a main effect for autism status, $F(1, 192)=21.83, p<.001$, showing autistic individuals reported lower subjective physical health. There was a two-way interaction between SAB and autism status, $F(1, 192)=3.83, p=.036$, with AFAB autistic people reporting lower scores. The three-way interaction among ethnoracial identity, SAB, and autism status was marginal, $F(1, 192)=3.83, p=.056$, with Black or Latine AFAB autistic people trending towards reporting poorer physical health.

Psychological Well-Being. Consistent with our hypothesis, there was a main effect of autism status, $t=-2.76(1), p=.006$, with autistic individuals reporting lower subjective psychological well-being. Contrary to our hypothesis, there were no significant interactions.

Social Relationships. Consistent with our hypothesis, there was a main effect for autism status, $F(1, 192)=12.69, p<.001$, such that autistic individuals reported lower or poorer subjective social relationships. Contrary to our hypothesis, we found no significant interaction effects.

Environment. There was a main effect of autism status, $t=-2.82(1), p=.005$, consistent with our hypothesis, such that autistic individuals reported poorer subjective environments. Contrary to our hypothesis we found no significant interaction effects.

Conclusions:

Our findings indicate, consistent with previous research, that autistic people report lower subjective quality of life across all well-being domains.

With regards to intersecting identities, the domain in which this appears to be most relevant is physical health. We found that AFAB autistic people report significantly poorer physical health, with a trend towards AFAB Black or Latine indicating worse physical health than other assessed groups. Our findings suggest that public health policy and future research should provide increased focus on the physical well-being of autistic people.

AFAB autistic individuals in particular may require additional support around physical health needs.

436.011 Navigating Uncertainty: Autistic Adults' Perspectives on Their Quality of Life during the COVID-19 Pandemic

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Background: While it has been suggested that autistic individuals may be less affected by social restrictions due to lower motivation for social interactions, many reported increased feelings of isolation and negative mental health impacts during the COVID-19 pandemic (Pellicano et al., 2022). Some relied on family and friends for mental health support (Stewart et al., 2023). Few studies were conducted during the later stages of the pandemic, and fewer addressed multiple life domains such as social, educational, and employment contexts (Bal et al., 2021; Mosquera et al., 2021). This study provides a broad understanding of autistic adults' quality of life across these areas during COVID-19.

Objectives: The purpose of this qualitative study was to understand autistic adults' perspectives on their quality of life during the pandemic. We specifically examined autistic adults' mental health and sense of belonging in social, educational, and employment settings.

Methods: Participants were recruited from a large sample of autistic adults who had taken part in a summer computer game development internship at a local university in the western United States. Fourteen autistic adults, aged 19 to 32, participated in the study. Participants reported being either in high school or college when the pandemic began. Each participant completed a semi-structured interview lasting between 20 to 45 minutes during the summer of 2023. Interviews were audio-recorded and transcribed verbatim. A theme-based approach was used for data analysis and coding (Braun & Clarke, 2006). A codebook was developed, detailing all the themes, their definitions, and example excerpts. The interview transcripts were coded using the Dedoose software tool.

Results: Thematic analysis identified four key themes: (1) Emotional well-being and mental health support, (2) Social interactions and relationships, (3) Sense of belonging in educational settings, and (4) Inclusion and exclusion in employment. First, autistic adults reported diverse mental health experiences. While some faced challenges like worsening depression, others noted positive aspects, such as increased personal focus due to reduced social interactions. However, many struggled to find therapists who could adequately support their mental health needs. Second, although some participants had limited social lives before the pandemic, they experienced deeper feelings of loneliness and isolation during the pandemic. Most relied on social media or online platforms (e.g. Discord) to maintain relationships with friends. Third, while some participants were satisfied with online classes and felt supported by their teachers, they expressed a desire for deeper peer connections that could only be achieved through in-person interactions. Finally, remote work made it difficult for autistic adults to access support for job-related tasks. They suggested that workplaces organize more social events to help them connect with coworkers.

Conclusions: The varied emotional and mental health experiences of autistic adults during the pandemic highlight the need for accessible, neurodiversity-affirming mental health support such as individualized counseling. Both educational institutions and workplaces should adopt inclusive, flexible models that promote meaningful connections and community, ensuring autistic adults receive the support needed to thrive.

436.012 Negative Automatic Thoughts, Emotion Regulation, and Anxious and Depressive Symptoms in Autistic Adults

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Background:

Theoretical frameworks based in Cognitive Behavioral Therapy postulate negative cognitions arise in reaction to life stressors. These negative thinking patterns may lead to significant psychopathological symptoms, including anxiety and depression (Buschmann et al., 2017). Anxiety and depressive disorders are two of the more prominent co-occurring conditions experienced by autistic adults and have been linked to repetitive negative thinking (McKenney et al., 2023). Emotion regulation (ER) is a transdiagnostic feature found in anxiety/depression, and autistic adults are more likely than their neurotypical peers to use maladaptive emotion regulation strategies, including less cognitive reappraisal and more expressive suppression (Cai et al., 2018). However, the relationships among negative automatic thoughts (NAT), ER strategies, and anxiety/depression have not yet been tested in autistic adults.

Objectives:

1. To evaluate the relationships between NAT, ER, and anxious and depressive symptoms; and,
2. To test whether ER serves as a mediator between NAT and anxious or depressive symptoms.

Methods:

The current study included 144 autistic adults (62 females, 52 males, 30 other-reported gender; Mage= 38.06 years; SD age= 12.47; 54.5% White) who were recruited as part of a larger online study through Simons Powering Autism Research (SPARK) Research Match (<https://sparkforautism.org/portal/page/spark-research-match/>). To be eligible, individuals needed to self-report an autism diagnosis and score above the clinical cutoff on the Autism Spectrum Quotient – 10 items (AQ-10; Allison, Auyeung, & Baron Cohen, 2012). Eligible participants then completed the Automatic Thoughts Questionnaire-8 (ATQ-8; Netemeyer et al., 2002), the Emotion Regulation Questionnaire (ERQ, Gross & John, 2003), and the PROMIS measures of Anxiety and Depression (Cella et al., 2010). The ERQ consisted of cognitive reappraisal and expressive suppression subscales. Correlations were used to examine relationships among the variables, while Process Macro (Hayes, Allison & Alexander, 2014) was used to examine the direct and indirect effects of NAT on anxious and depressive symptoms as mediated by ER strategies.

Results:

Correlations indicated significant relationships between depression and anxious symptoms, as well as anxious and depressive symptoms with NAT (Table 1. The overall models for both anxious symptoms (Figure 2a) and depressive symptoms (Figure 2b) were significant, indicating that 25% of the variance for anxiety and 56% of the variance for depression were explained by the full model of NAT, cognitive reappraisal, and expressive suppression. While there were significant main effects showing positive relationships of NAT both with anxious symptoms, $\beta=.45$, $p>.001$, and with depressive symptoms, $\beta=.65$, $p>.001$, no direct or indirect effects for cognitive re-appraisal or expressive suppression emerged.

Conclusions:

The results indicate significant relationships between negative thinking and anxious/depressive symptoms in autistic adults, consistent with prior findings. However, cognitive reappraisal and expressive suppression do not appear to mediate these relationships. Future work might consider the moderating role of ER, and the possibility that autistic adults use alternative ER strategies. These findings have implications for intervention strategies for anxious and depressive symptoms in this population, as negative thinking patterns may need to be targeted more directly than ER strategies.

**436.014 Outcomes of People Who Received ABA Therapy: Life Satisfaction and Camouflage**

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Background: Some individuals diagnosed with autism spectrum disorder (ASD) early in life via gold-standard methods go on to lose the autism diagnosis (LAD) as adolescents (Fein et al., 2013). LAD individuals are more likely to have received applied behavior analysis (ABA) therapy than those who retain the diagnosis (Orinstein, et al., 2014). Interventions like ABA can enhance functional and adaptive skills, likely leading to greater life satisfaction (Schmidt et al., 2015). However, critics have argued that ABA leads to increased masking or camouflaging of autistic traits rather than skill-building (e.g., Anderson, 2022).

Objectives: The current study compares the types of interventions received by autistic and LAD participants, and tests associations between intervention history and later outcomes of life satisfaction and camouflaging.

Methods: The study sample included autistic ($n=31$, 9 females) and LAD ($n=30$, 3 females) participants ages 15-30 years; Table 1. Participants in both groups had received an expert diagnosis of autism prior to the age of five years. Participants in the LAD group could not meet criteria for autism, according to the Autism Diagnostic Observation Schedule-2 (ADOS-2) and expert clinical judgement at follow-up; all participants in the autism group did meet ASD criteria in this way. Participants completed self-report questionnaires including the Satisfaction with Life Scale (SWLS) and the Camouflaging Autistic Traits Questionnaire (CAT-Q).

Results: Participants in the autism group were more likely to have received special education services, $p=.02$. They were also significantly more likely to have received social skills services and to have had an Individualized Education Program (IEP), $p<.05$; in contrast, many LAD individuals did not receive these supports. Autistic and LAD participants who received ABA therapy reported significantly higher Life Satisfaction ($M=25.5$, $SD=5.2$) relative to those who did not ($M=19.3$, $SD=6.6$), $p=.01$; Figure 1. Contrary to predictions, participants who had received ABA therapy reported fewer camouflaging behaviors ($M=3.9$, $SD=.94$) than those who did not ($M=4.6$, $SD=1.0$), $p=.03$.

Conclusions: Results suggest that currently autistic participants were more likely than their peers who had lost the autism diagnosis to have received more intensive school-based services such as special education and to have had an IEP. For both groups, engagement in ABA services was associated with positive outcomes including overall life satisfaction and less camouflaging. These cross-sectional results are consistent with two possibilities, which are not mutually exclusive. Individuals with a history of ABA may have built skills that enabled greater community and social engagement, leading to enhanced satisfaction. The pattern of group differences could also indicate that the LAD group may have started with milder autism symptoms.



436.015 Participatory Autism Knowledge Matters: Perceptions of an Autistic Employee's Competency and Attitudes Towards Workplace Social Inclusion

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Background: Autistic adults are unemployed at high rates. Differences in the way autistic adults socialize and empathize compared to non-autistic, are often associated with employment challenges. Previous findings have indicated that consistent with the Double Empathy Problem (DEP), the different ways that autistic people function and socialize at work are more likely to be misunderstood by non-autistic others compared to autistic. The consequences of autistic workplace behaviour being misunderstood by the non-autistic majority, are potentially negative perceptions towards an autistic employee's competency and suitability for their job and negative attitudes towards their social acceptability as a coworker. However, being autistic, being more knowledgeable about autism, or being familiar with autistic persons may predict more positive perceptions of and attitudes towards an autistic employee. It is not known if these associations independently contribute to positive perceptions and attitudes or do so through better understanding of autistic behaviour.

Objectives: This study examined neurotype (autistic/non-autistic), interpretation of autistic employee behaviour, autism knowledge and autism experience, as predictors of perceptions of an autistic employee's competence and attitudes towards their social acceptability in the workplace. Additionally, this study explored accurate autistic employee behaviour interpretation as a mediator of associations between the predictors and more positive perceptions and attitudes.

Methods: Data for this study were previously collected from a larger sample in an online anonymous survey that asked participants to read and answer questions about a hypothetical autistic employee (described in a vignette) having a difficult workday. Participants (77 autistic, 152 non-autistic) read the vignette and completed scales measuring perceptions of the autistic employee's competency and suitability for their job and attitudes towards their social acceptability as a coworker. Included in the analysis were previously measured behaviour interpretation scores, autism knowledge, and autism experience.

Results: Autism knowledge significantly predicted more positive competency/suitability scale scores ($b = .570, p < .001$) and social acceptability scale scores ($b = .417, p < .001$) towards the hypothetical autistic employee, regardless of neurotype, behaviour interpretation ability, and autism experience. However, autism knowledge was significantly more influential regarding more positive perceptions and attitudes scale scores when participants scored poorly on behaviour interpretation towards the autistic employee.

Conclusions: Negative impressions of an autistic adult's competency and suitability for work, and negative attitudes about socially including them in the workplace have the potential to impact their employment success and workplace quality of life. Autism knowledge was strongly associated with having more positive perceptions towards an autistic employee's competency and more positive attitudes towards their social acceptability as a coworker. Additionally, autism knowledge was more impactful regarding positive perceptions of and attitudes towards the autistic employee when the autistic employee's workplace behaviour was poorly understood. Findings have implications for educating employers and coworkers about autism and autistic experiences in employment as a promising workplace support for autistic adults.



436.016 "It's a Very Strange Metamorphosis" Unmasking the Impact: A Qualitative Study Exploring Experiences of Traumatic Brain Injury in Autistic Adults

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Background:

There are no existing publications specifically exploring the impact of traumatic brain injury (TBI) on autistic individuals, despite an elevated risk of TBI in this population due to co-occurring conditions (e.g., epilepsy, sleep disorders), self-injurious behaviours and risk from assault. The experience of TBI in autistic individuals may differ from non-autistic individuals due to neurobiological differences, sensory processing variations, and sociocultural challenges. These characteristics could significantly affect recovery trajectories, symptom burden, and healthcare needs. This study addresses the gap by investigating the experiences of autistic TBI survivors and how TBI affects their daily lives and self-identity.

Objectives:

- Conduct semi-structured interviews with 16 autistic TBI survivors
- Conduct a mixed inductive and deductive thematic analysis

Methods:

A phenomenological approach was used to capture first-person perspectives on post-TBI life among autistic individuals. Sixteen participants with a confirmed autism diagnosis and history of TBI, were recruited through autism and brain injury charities. Data collection involved semi-structured interviews focusing on the impact of TBI across various life domains. A Public and Patient Involvement (PPI) group reviewed the interview questions. Thematic analysis of transcripts was conducted using NVivo 14, guided by Braun and Clarke's six-phase approach.

Results:

Participants included 6 women (37.5%), 9 men (56.3%), and 1 non-binary person (6.3%), with an average age of 42.88 years. The mean age at the time of TBI was 27.31 years (range 14-45), and the mean age of autism diagnosis was 35.81 years (range 6-60). TBI severity was distributed as 37.5% moderate-severe, 31.3% mild, and 31.3% symptomatic (possible TBI). Injury mechanisms comprised falls (31.3%), motor vehicle accidents (25.0%), being struck by or against an object (25.0%), assaults (12.5%), and sports injuries (6.3%). Co-occurring neurodevelopmental conditions included ADHD (18.8%), dyslexia (12.5%), dyspraxia (6.3%), and intellectual disability (6.3%).

Preliminary thematic analysis revealed four key themes:

1. **Transformation of Self and Identity:** A sense of disconnection from their pre-injury identity was reported, sometimes viewing the injury as exacerbating feelings of being different. Some experienced a loss of social masking drive, perceived as an opportunity to embrace authenticity.
2. **Heightened Sensory Sensitivities:** Many reported increased sensitivity to noise, light, and touch, resulting in sensory overload and disrupted daily functioning. Altered pain perception was also noted.
3. **Social Isolation and Withdrawal:** Increased social avoidance was commonly linked to sensory overload and anxiety, with many participants adopting reclusive behaviours as a coping mechanism.
4. **Challenges in Healthcare Experiences:** Participants frequently encountered difficulties communicating their needs to healthcare providers, encountering impaired communication due to pain or environmental disturbance

Conclusions:

The findings suggest that TBI may interact with pre-existing neurobiological and sociocultural challenges associated with autism, leading to compounded and atypical difficulties. This dual impact often results in experiences of identity disruption, amplified sensory sensitivities, and increased social withdrawal. Research is needed on the prevalence of TBI in autistic populations and the influence of co-occurring conditions, such as ADHD, to better support this population. Future studies should guide the development of autism-specific interventions to address the unique recovery needs of autistic TBI survivors.

436.017 Persistence of Autism Spectrum Disorder: Insights from a Longitudinal Follow-up Study in China

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Background: Research on the stability of autism spectrum disorder (ASD) has become a growing area of interest, as it is related to the screening policies and special health-care services. Previous studies indicate that approximated 10-20 percentage of children with ASD no longer met the diagnostic criteria as they age. A recent study by Harstad et al. found that 37.1% of children with ASD no longer met the diagnostic criteria. The high rate of diagnosis withdrawal raises important questions about early diagnosis and treatment for autism spectrum disorder, particularly in China where the National Health Commission has implemented a screening and intervention service for children aged 0-6 as part of the Healthy China 2030 project this year.

Objectives: To better understand this issue, we reviewed data from the Shanghai Autism Early Development (SAED) Cohort, which follows ASD children for 3 to 7 years, to provide further insights and contribute to the ongoing discussion.

Methods: The participants in this study were part of the SAED Cohort, a longitudinal cohort established in 2015 aimed at promoting the diagnosis, treatment, and prevention of ASD. The study included 66 children (median age 44.00 months, 78.8% boys) who had previously been diagnosed with ASD according to the DSM-5 criteria. Follow-up assessments were conducted using the ADOS module scores and CARS total scores.

Results: Out of the 66 participants, 15 (22.7%) no longer met ASD diagnosis at follow-up. There were no significant differences in age, gender, age of independent walking, caregiver's education level or family economic situation between two groups. However, compared to the persistent ASD group, the non-persistent ASD group had significantly differences in baseline CARS scores, ADOS-CSS scores and cognitive levels (threshold: 70). In a multilevel logistic regression model, compared to children with persistent ASD, children with non-persistent ASD tend to have lower baseline CARS and ADOS-CSS scores.

Conclusions: The withdrawal rate for diagnosis in this study of SAED Cohort is 22.7% (42.3% of cognitive >70, 10% of cognitive <70), which is closer to the 19% withdrawal rate reported by Lord et al. in 2022, but significantly lower than that reported by Harstad et al (37.1%). This difference may stem from a combination of factors, such as medical referral system, cultural differences, socioeconomic factors. The current prevalence of autism in China is estimated to be 1%, suggesting a possible lack of sufficient screening. While there are variations and constraints, the patients identified in the persistent group in SAED cohort share similarities in characteristics, including age, gender distribution, and cognitive ability distribution, with those in the study by Harstad et al which has provided valuable insights into the literature. While the withdrawal rate for ASD diagnosis in school age still requires further research with a larger sample size, potentially involving the use of different ethical data. Data from various countries and cultural backgrounds should obtain a more comprehensive and diverse global perspective on the persistence of ASD diagnosis, providing evidence to fit health economics and to guide screening policies and special health-care services.

436.018 What about the Well-Being of Autistic Adults Living in an Autism Specific Group-Home ?

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Background: Most autistic adults stay in residential facilities operating with limited resources and rarely are they specifically designed to meet their needs. Literature shows that quality of life (QoL) of autistic adults living in group-homes is often inferior compared to other living situations while living in an autism-specifically designed facility has not been assessed yet to our knowledge. Considering that the living environment is an important determinant of quality of life and social inclusion, this context provides a unique opportunity to understand the factors in the living environment that promote the well-being of autistic adults living in group-homes.

Objectives: This study aims to assess the well-being of autistic adults for 3 years after moving to an autism specifically designed residence (specific architectural and clinical approaches) on 1) QoL; 2) emotional well-being; 3) level of functioning.

Methods: 12 autistic adults (8 females; 4 males), aged 21-55 years, all living in the same autism-friendly residence each with their own bedroom were included. The majority of participants (92%) came from a family setting and all required mild to moderate levels of support (mean IQ 61.3 ± 16.1). Data was gathered from (a) clinical records (eg. IQ, associated diagnoses) and (b) questionnaires completed by parents and staff, measuring QoL (*San Martin Scale - Quality of life Assessment for People with significant disabilities*), emotional well-being (*Emotional Problem Scales*), and level of adaptive functioning (*Adaptive Behavior Assessment System, 2nd edition*). Data was collected at four different time points: three months before moving into the residence (T0), and at 9 months (T1), 21 months (T2), and 36 months (T3) after moving in. Repeated paired-samples t-test assessed the progression of each variable over time.

Results: Before moving in (T0), the participants showed average levels of QoL ($M 97.6 \pm 9.8$) and emotional well-being ($M 9.9 \pm 2.0$) according to their parent's assessment. Notably, no decline in quality of life, emotional well-being, or adaptive functioning was observed during the three years following the move. According to parents and educators, QoL increased at T2 (21 months) and this increase remained at T3 ($M T2$ parents 104.1 $SD 6.7$, $p=.03$; $M T2$ educators 106.0 ± 10.1 , $p=.01$), while emotional well-being and adaptive behaviour remained stable across the four measures (all $p>.05$).

Conclusions: Moving from a family setting to an autism-friendly residence did not impair QoL, emotional well-being nor level of functioning of autistic adults over a 3-year period. An improvement in QoL was observed 21 months after moving in and remained until the end of the study. Living in an autism-friendly residence facility, which provide autism-specific architectural and clinical approaches, seems to support the well-being of autistic adults. Further analyses will identify the contribution of specific architectural, clinical and lifestyle components to the current results.

436.019 Pilot Testing a Novel Self-Reported Measure of Loneliness for Autistic Adults

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Background: Advancing measurement of well-being and related constructs in autism is a priority echoed by researchers, autistic adults, and others in the autistic community. Loneliness - an unpleasant feeling due to a perceived incongruence between desired and actual social functioning - is common among autistic adults and linked with a range of poor adult outcomes. Existing measures of loneliness do not fully capture the experience of loneliness among autistic adults and have little to no psychometric support, which precludes further advancement of this line of research.

Objectives: Guided by the Patient-Reported Outcomes Measurement Information System (PROMIS) framework, this study aimed to 1) develop and refine an item pool based on a pre-specified conceptual model of loneliness and cognitive interviews, and 2) pilot test the novel self-reported measure of loneliness, the Loneliness in Interpersonal Networks Questionnaire for Autistic Adults (LINQ-AA).

Methods: The item pool was developed by mapping items from existing loneliness measures onto a conceptual model (119 items from 7 measures) created as part of previous phases of the larger research study and includes 3 relationship domains [1) closest relationships (CR), 2) causal friends and/or acquaintances (CFA), and 3) community connections (CC)]. Items were revised and excluded as needed and new items were written to ensure adequate construct coverage. Cognitive interviews (n = 6) were conducted with autistic adults following a combined think-aloud and respondent debriefing methodology previously used by Mazefsky and colleagues (2018) and resulted in minor revisions to the instructions, response options, and item pool. Pilot data were collected from autistic adults (n = 38) via Qualtrics on the LINQ-AA as well as another measures of loneliness (UCLA Loneliness Scale Version 3), mental health (Hospital Anxiety and Depression Scale), and quality of life (WHO Quality of Life 4-item composite). Sum scores were generated for all three LINQ-AA loneliness relationship domains, as well as an overall total. Scores were graphed, and descriptive statistics and preliminary psychometrics (i.e., internal consistency and construct validity) were calculated.

Results: LINQ-AA scores covered a wide range of loneliness (Table 1) and were normally distributed (skew = -.29 - .22; kurtosis = -.75 - .15). Regarding internal consistency, Cronbach's alpha was excellent for all domains (CR: $\alpha = .94$; CFA: $\alpha = .90$; CC: $\alpha = .90$). Correlation amongst the three LINQ domains were all positive and ranged in magnitude from weak to strong (Table 1). The LINQ-AA scores were generally more strongly correlated with another measure of loneliness, compared to measures of mental health and quality of life, and uncorrelated with age; all correlations were in the expected directions (Table 1).

Conclusions: The findings of this study provide preliminary psychometric support among autistic adults for the LINQ-AA - a novel self-reported loneliness questionnaire developed using the PROMIS framework that taps into areas often excluded from existing tools. Future studies should examine the latent factor structure and further evaluate the LINQ-AA's properties. This tool may be useful for research and clinical practice that have direct implications for the well-being and quality of life of autistic adults.



436.020 Predictors of Adaptive Functioning in Autistic Dependent Adults

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Background:

In adults with autism, difficulties with adaptive functioning (ability to manage everyday tasks) can create significant challenges, but we lack a deep understanding of the factors that impact these skills. Exploring how socioeconomic status (SES), race, and ethnicity impact these outcomes is also crucial, as these factors influence access to services and support. Identifying key predictors can guide the development of personalized interventions to improve the quality of life for dependent autistic adults.

Objectives:

To explore behavioral, genetic and demographic predictors of adaptive functioning as measured by the Vineland-3 in dependent autistic adults within the Simons Foundation Powering Autism Research Knowledge (SPARK) study (The SPARK Consortium, 2018).

Methods:

Stepwise multiple linear regressions were used to identify predictors of adaptive functioning in dependent autistic adults (n = 2,918). Dependent variables were standard scores from the Vineland Adaptive Behavior Scales, Third Edition (Vineland-3), including overall adaptive functioning (ABC) and its Communication, Daily Living Skills, and Socialization domain composites. Predictors included the presence of a genetic diagnosis, behavioral scores from the Repetitive Behavior Scale-Revised (RBS-R), such as stereotyped, self-injurious, compulsive, ritualistic, sameness, and restricted sub-scale behavior scores, age at autism diagnosis, socioeconomic status (Area Deprivation Index percentile), sex, and race/ethnicity. Model fit was evaluated using R-squared values. Results include unstandardized coefficients, showing the expected change in Vineland-3 scores for a one-unit increase in predictors.

Results:

The analysis identifies several negative predictors of adaptive functioning, including the presence of a genetic diagnosis (Estimate = -6.02, 95% CI [-7.77, -4.29], $p < .001$), higher scores in stereotyped behavior (Estimate = -1.62, $p < .001$), self-injurious behavior (Estimate = -0.80, $p < .001$), and sameness behavior (Estimate = -0.43, $p < .001$). These are significantly associated with poorer adaptive functioning across domains. In contrast, increased ritualistic behavior predicts better outcomes in adaptive functioning (Estimate = 1.01, $p < .001$).

Age at autism diagnosis (Estimate = 0.08, $p < .001$) and Area Deprivation Index (ADI) (Estimate = 0.04, $p < .01$) show a small, positive predictive association with adaptive functioning. Greater socioeconomic challenge is associated with higher Vineland scores across domains. Racial and ethnic influences vary, particularly in socialization, but the small sample sizes of non-White groups caution against over-interpretation.

Overall, the models explaining the variation in the four Vineland-3 composite scores performed similarly, with the ABC composite and communication models both explaining around 23.8% of the variation ($R^2 = 0.238$ vs. $R^2 = 0.239$, Adjusted $R^2 = 0.2347$ vs. 0.2367). The low percentages suggest that other, unmeasured factors contribute to adaptive functioning, indicating the need for further analysis.

Conclusions:

Behavioral and demographic factors are associated with adaptive functioning in dependent autistic adults. A strong negative relationship exists for those with an autism-related genetic diagnosis. A small but consistently positive relationship exists between lower socioeconomic status and adaptive functioning. Interestingly, ritualistic behavior also shows a positive association with adaptive functioning. The nuanced effects of race and ethnicity highlight the need for further research to identify additional predictors that can improve our understanding of adaptive functioning.

436.021 Predictors of Transition Readiness Among Diverse Autistic Adolescents

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Background:

The transition from high school to adulthood presents unique challenges for autistic adolescents and their families. Autistic adolescents experience low rates of employment and reduced access to structured support prior to leaving the formal school system.^{1,3} Latinx autistic adolescents and their parents may experience additional barriers to a successful transition, such as a higher likelihood of experiencing poverty, limited Spanish resources, and reduced autism knowledge.^{4,6} Emerging literature highlights how unique cultural values, such as emphasis on familial and community relations, can increase transition readiness.⁵ Support from community, family, and peers, as well as mental health and transition support services, can positively influence an individual's transition to adulthood.^{3,7-9}

Objectives:

We sought to understand whether the quality of family and peer relationships relate to transition readiness among Latinx and non-Latinx autistic adolescents, with consideration of primary language and level of independence.

Methods:

English and Spanish-speaking parents and their autistic adolescents (n=36, aged 14-21) participated in a larger clinical trial testing a transition to adulthood support program. At baseline, parents completed the Transition Readiness Scale (measures feelings, thoughts, and behaviors related to the transition), PROMIS Parent Proxy Peer Relationships (measures quality of youth's friendships), PROMIS Parent Proxy Family Relationships (measures youth's subjective experience of being in their family), Waisman Activities of Daily Living (W-ADL) (assesses youth's activities of daily living such as chores and preparing food), and a sociodemographic survey. We performed multiple linear regressions to investigate the association between peer and family relationships with transition readiness (Table 2).

Results:

Thirty-six parents completed the baseline questionnaires (Table 1). Linear regression analyses showed that Family Relationships were significantly positively associated with Transition Readiness, but this association did not remain significant when controlling for language and level of independence on the W-ADL. Language, however, was a significant positive predictor of Transition Readiness, with Spanish-speaking families ($M=52.55$, $SD=15.57$) reporting significantly higher levels of transition readiness than English-speaking families ($M=39.64$, $SD=10.69$), $t(34) = -2.71$, $p=.01$. In a separate linear regression model, Peer Relationships were significantly positively associated with Transition Readiness, and remained a significant positive predictor of Transition Readiness after controlling for language and level of independence. When analyzed in a single regression model, peer relationships were a significant predictor of transition readiness, controlling for family relationships, language, and level of independence. This full model accounted for the greatest variance of all models tested.

Conclusions:

Peer relationships are a strong predictor of transition readiness. Interventions aiming to help parents and their autistic adolescent with the transition to adulthood should consider including content that fosters peer relationships, communication, and other skills related to peer relationship building. In contrast, family relationships do not significantly predict transition readiness after controlling for language. Because Spanish-speaking families reported higher levels of transition readiness, this indicates that cultural background may be a moderator, playing a greater role in shaping the association between family relationships and transition readiness. Future studies should examine the influence of language, culture, and resilience on transition readiness, empowerment, and social support, especially among Latinx families.

**436.023 Presence and Age of Onset of Parkinsonism Features Among Middle Age and Older Adults with Autism, Parkinson's Disease, or Neurotypical Development**

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Background:

The motoric features associated with Parkinson's Disease (PD), such as tremors, slowness in movement, and limb stiffness are increasingly linked with autism during middle and older adulthood. However, no study to date has directly compared these parkinsonism features between autistic adults and adults with PD to identify similarities and differences in motoric symptoms and their age of onset. This information is a critical first step towards pinpointing shared and unique developmental and etiological origins of these motoric features for autistic adults as compared to adults with PD.

Objectives:

Compare and contrast parkinsonism motoric features and their age of onset between autistic adults, adults with PD, and neurotypical adults.

Methods:

210 autistic adults (58% female assigned-sex; Age: $M=55$, range=42-80 years) were recruited via the Simons Powering Autism Research (SPARK) Research Match service. 103 adults with PD (47% female assigned-sex; Age: $M=65$, range=40-91 years) were recruited via The Michael J. Fox Foundation participant registry and NIH Research Match. And finally, 106 neurotypical (NT) adults without autism or PD (54% female assigned-sex; Age: $M=60$, range=40-78 years) were recruited via NIH Research Match. Participants from all three groups completed the Parkinsonism Screening Questionnaire (PSQ) to compare PSQ screening score $[(2 \times \text{stiffness}) + (5 \times \text{tremors}) + (5 \times \text{arm swing}) + (5 \times \text{stuck on floor})]$ and screening-status. Additionally, age (9 categories ranging from 'Before-age-10' to '80-89') when endorsed parkinsonism symptoms were first noticed was compared between the autism and PD groups.

Results:

While groups did not differ in assigned-sex ratio ($\chi^2=3.38$, $p=.19$), they differed in age (PD group > NT group > autism group; $F=34.64$, $p<.001$). After controlling for age, parkinsonism screening score differed by group, with the PD group ($M=10.16$, $SD=4.43$) having a higher score than the other two groups and the autism group ($M=2.63$, $SD=3.52$) having a higher score than the NT group ($M=1.12$, $SD=1.51$; $F=137.62$, $p<.001$). Similarly, parkinsonism screen positivity rates were highest for the PD group (84%) followed by the autism group (20%), and the NT group (3%; $\chi^2=187.15$, $p<.001$). There were also marked differences in age of onset of parkinsonism symptoms between the PD and autism groups. Specifically, the autistic adults reported earlier ages of onset for all 6 parkinsonism symptoms evaluated compared to the adults with PD ($Zs>4.54$, $ps<.001$; see simplified [adult vs. child onset of symptoms] data depiction in Figure 1).

Conclusions:

In the first study to directly compare parkinsonism features among autistic adults, adults with PD, and NT adults, the current study extends prior findings of elevated parkinsonism in autism. While middle and older age autistic adults were more likely to screen positive on a self-rated parkinsonism scale than similarly aged NT adults, screen positivity rates were considerably lower in the autism group than the PD group. Perhaps most strikingly, parkinsonism symptom onset differed markedly between autistic adults (younger onset) and adults with PD. Findings implicate a different developmental course to several parkinsonism features among many autistic people compared to those with PD, though the results reveal large individual differences in the autism group. This study represents a first step to better understanding the developmental origins of parkinsonism among autistic people.



436.024 Prevalence and Context of Injurious Falls Among Young, Middle, and Older Autistic Adults

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Background: Mobility limitations and fall risk increase as non-autistic adults age and are associated with high morbidity and mortality in older adulthood (Hirvensalo et al., 2000; Davis et al., 2015; Freiburger et al., 2020). One in four non-autistic older adults (65+ years) falls, and one in five of these falls is injurious (Kakara et al., 2023; CDC, 2023). However, little is known about the prevalence of injurious falls in autistic adults, the context of these falls (i.e., when and why it occurred, how severe it was), and whether autistic fall risk changes over the lifespan in a way that mirrors that of non-autistic adults. Given that autistic people experience motor differences including postural instability, they may be at risk for earlier and/or more injurious falls compared to non-autistic peers.

Objectives: To determine the prevalence of falls experienced by autistic adults across young, middle, and older adulthood compared to non-autistic adults, and to characterize the context of autistic adults' falls.

Methods: We accessed retrospective data from the electronic medical records of patients who were seen by Michigan Medicine providers (University of Michigan healthcare system) between January 1, 2000 and December 22, 2023. Data were obtained using the university's data warehousing service, DataDirect. Autistic vs. non-autistic patients and fallers vs. non-fallers were classified based on their problem list and list of diagnoses using ICD-9, ICD-10, and Michigan Medicine billing and diagnostic codes.

Results: 7,807 autistic adults (18-89 years) and 4,459,006 non-autistic adults (18-90 years) were seen within the Michigan Medicine system during this period. These two groups were equivalent in age distribution, but the autistic group had a higher proportion of males, consistent with population sex ratios (Table 1). Of these, 16.28% ($n=1,271$) of autistic adults were seen for injurious falls compared to 3.68% ($n=164,003$) of non-autistic adults. Young, middle, and older autistic adults all experienced more falls than non-autistic adults (Fig. 1). Differences were especially pronounced in older adulthood, where 30.23% of autistic adults experienced injurious falls relative to 4.98% of non-autistic adults. Autistic fallers and non-fallers were similar in age, sex, and racial and ethnic distribution (Table 1). For autistic fallers, "abnormality of gait" (50.14%), "history of falls" (21.50%), and "fall (general/unspecified)" (21.07%) were the most frequent encounter codes across 3,921 fall-related encounters.

Conclusions: Autistic adults experienced injurious falls more often than non-autistic adults across young, middle, and especially older adulthood. These findings underscore the need for prospective studies of fall risk and protective factors to determine the appropriate assessment and intervention protocol for autistic people as they age. Planned future analyses will examine patient-centered risk factors including co-occurring conditions and polypharmacy. Although a wide range of specific ICD codes for fall context exists, encounter codes assigned by clinicians were nonspecific, yielding little information that could be used to support intervention. As the autistic population ages into middle and older adulthood, it is crucial to determine whether they experience the same type and timing of risks as non-autistic adults, and whether existing fall prevention strategies are effective for this community.



436.025 A Dimensional Approach to Measuring “Outcome”: Measurement of Changes in Mental Health and Community Engagement in a Sample of Middle-Aged Autistic Adults Enriched for High Support Needs

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Background: The few longitudinal studies in autism have found that 3-50% of autistic adults experience what researchers have classified as a “positive” outcome (Mason et al., 2020). However, researchers typically use a single “fixed” outcome rating (e.g., Overall Outcome Rating Scales [OOR], Howlin et al., 2004) that does not capture changes across adult development. The goal of the current study was to contrast a commonly used outcome measure with a dimensional measure of outcome as it changes across adulthood in mental health and community engagement.

Objectives: We aimed to 1) Assign outcome group ratings, 2) Identify patterns of changes in mental health and community engagement over 8.5 years, and 3) Contrast patterns of change with outcome rating groups.

Methods: Participants were part of a longitudinal cohort diagnosed in childhood at the UNC TEACCH Autism Program between 1969-2000 ($M_{age}=7.29$, $SD=4.04$, $range=2.72-16.56$) enriched for high support needs ($M_{IQ}=61.71$, $SD=24.74$). Caregivers completed a survey about adult outcomes between 2014-2016 (Wave 2) and 2023-2024 (Wave 3). The OOR (a “fixed” rating) defined outcome based on employment, independent living, and social participation. Dimensional ratings were calculated for Mental Health (e.g., anxiety, depression, maladaptive behavior) using the Anxiety, Depression, and Mood Scale (ADAMS) and Reiss Scale of Maladaptive Behavior (RSMB). Ratings for Community Engagement included belonging (QOL-Q; Schalock & Keith, 1993), community participation, and employment ratings. Dimensional change in Mental Health and Community Engagement was calculated using residuals from Wave 2 predicting Wave 3, with negative scores indicating improvement. K-Means Clustering identified patterns of change. Cluster membership and change scores in Mental Health and Community Engagement were compared between outcome groups.

Results: Wave 3 included 47 participants ($M_{age}=48$, $range=40-61$). Adults were categorized using OOR as Very Good/Good ($n=7$), Fair ($n=16$), and Poor/Very Poor ($n=24$). Wave 3 Mental Health ($p=.23-.87$) and Community Engagement ($p=.20-.16$) did not differ across outcome groups, although better outcome was associated with greater employment. Examining patterns of dimensional change from Wave 2 to Wave 3, two clusters were identified in Mental Health ($n=24$ “Worsening”, $n=23$ “Improving”) and three in Community Engagement ($n=15$ “Improving Employment”, $n=11$ “Improving Community Participation and Belonging”, $n=21$ “Worsening”). Change cluster membership in Mental Health was not associated with fixed outcome group rating, $X^2(2)=1.68$, $p=.49$, and change scores did not differ between the groups ($p=.11-.71$; Figure 1). Change cluster membership in Community Engagement was significantly associated with outcome group, $X^2(4)=20.01$, $p<.001$. Outcome groups differed in employment change, $H(2)=16.50$, $p<.001$, but not in community participation ($p=.30$) or belonging ($p=.46$; Figure 2).

Conclusions: In a sample of middle-aged autistic adults enriched for high support needs, outcome groups showed no differences in mental health and community engagement at Wave 3, except employment. Positive changes were observed across outcome groups, especially in mental health, community participation, and belonging. However, the pattern of changes in community engagement was most positive in the Very Good/Good group, who showed the greatest improvement in employment. Results documenting change during adulthood serve as a reminder to consider outcomes across adulthood as amenable to change to support aging well.

**436.026** Pubertal Trajectories in Autism: Predicting Adult Social and Adaptive Outcomes

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Background: Puberty is a critical developmental period that interacts with pre-existing developmental differences in ASD in complex ways. While previous research has shown substantial variability in pubertal timing and tempo among autistic individuals (Corbett et al., 2020), the long-term implications of these differences are not well understood.

Objectives: This study investigates how distinct pubertal trajectories predict long-term adult outcomes in individuals with autism, providing insight into how adolescent developmental processes may shape the adult lives of autistic individuals.

Methods: Data were collected from 170 participants with autism or non-ASD developmental delays (ASD=80.3%, female=15.2%, White=78.8%) from an ongoing longitudinal study. Thirty-one participants never received an ASD diagnosis, and participants are now in their early thirties. Pubertal development was assessed annually using the Pubertal Development Scale (PDS; Peterson et al., 1988) from ages 9-20. Adult outcomes included social factors (e.g. living situation, relationships, friendships), behavioral measures (e.g. irritability, hyperactivity), and adaptive skills (e.g. Vineland daily living skills). Group-based trajectory modeling was used to identify distinct pathways of pubertal development, followed by one-way ANOVAs and correlation analyses. Multi-level models (MLMs) assessed how trajectory groups predicted adult outcomes, controlling for pre-pubertal cognitive and adaptive functioning.

Results: Three distinct pubertal trajectory groups were identified: early onset with moderate development (35.2%), moderate onset with rapid development (57.1%), and late onset (7.7%). One-way ANOVAs revealed significant differences in post-pubertal outcomes, including education ($F(2,123)=3.57$, $p=.050$), Vineland socialization ($F(2, 127) = 4.88$, $p = .009$), and ABC irritability ($F(2, 133) = 4.95$, $p = .008$). Participants in the rapid development group had significantly higher socialization scores and lower irritability scores than those in the early and late development groups ($p=.045$; $p=.046$). There were no significant differences in post-pubertal ADOS CSS scores between groups ($p>.05$). However, more advanced pubertal development by age 16 was correlated with lower CSS restricted/repetitive behavior (RRB) scores ($p=.003$). MLMs further indicated that trajectory groups significantly predicted employment outcomes ($X^2 = 5.27$, $p = .027$), with participants in the early onset group more likely to be employed than those in either the rapid or late development groups. Correlation analyses showed that advanced pubertal development at ages 12, 15, and 18 was associated with higher educational attainment, employment, living independently, and happiness in adulthood.

Conclusions: This study highlights the importance of pubertal development in predicting long-term adult outcomes in individuals with ASD. Early and rapid pubertal development was associated with more positive adult outcomes in socialization, education, and employment. In contrast, delayed pubertal development was linked to greater behavioral challenges, and was associated with higher CSS RRB scores. Understanding these developmental trajectories can help inform targeted support during adolescence, improving long-term outcomes for autistic individuals as they transition to adulthood.

436.027 Recommendations for Improving Gastrointestinal Health Among Autistic Adults – Results from the GI Wanna Talk about Autism Study

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Background:

Gastrointestinal (GI) symptoms are common and disabling among autistic people. The "GI Wanna Talk About Autism" study used a participatory approach, involving a Community Board of autistic and non-autistic adults (n=26), to explore the lived experiences of autistic adults with GI symptoms and develop recommendations to improve their GI health. In Phase 1, we interviewed autistic adults and parents (n=27), who provided insight into GI-related experiences and recommendations for future research.

Objectives:

Phase 2 determined which of the Phase 1 recommendations were preferred by a larger sample of autistic adults and parents.

Methods:

A total of 509 participants were recruited via SPARK Research Match: independent autistic adults (n=259, 51%), dependent autistic adults (n=35, 7%), and caregivers of dependent autistic adults (n=215, 42%). Autistic adults in this sample were mostly men (n=283; 56%), non-Hispanic/Latino (n=428; 84%), with White (n=303; 60%), African-American/Black (n=132; 26%), and Asian (n=99; 19%) as the largest racial groups. Each group provided demographic and GI symptom data, and ranked the nine identified recommendations, which included: healthcare provider training, autistic adult healthcare advocacy training, interoception intervention, GI anxiety intervention, an electronic GI toolkit, GI symptom questionnaires, behavioral diet interventions, a healthcare professional database, and an interdisciplinary care coordination model.

Results:

Of the 259 independent autistic adults, most (n=197; 76%) experienced weekly GI symptoms over the past 3 months, of which 57% (n=112) reported symptoms lasting over 5 years. Two-fifths (n=109; 42%) had a GI diagnosis. The same number reported often/very often impairing symptoms. Over half rated the identified recommendations as very/extremely important (n=155; 60%) and very/extremely impactful (n=174; 67%). The top three recommendations were the healthcare provider training, autistic adult healthcare advocacy training, and the interdisciplinary care coordination model.

Among the self-reporting dependent autistic adults (n=35; 7%), most (n=22; 63%) reported experiencing weekly GI symptoms over the past 3 months, among which most (n=27; 77%) reported symptoms lasting over 5 years. A third (n=11; 31%) reported having a GI diagnosis, but a minority of the population (n=5; 13%) found the symptoms frequently impairing. Additionally, about half (n=18; 51%) rated the recommendations as very/extremely important and very/extremely impactful. Top three recommendations were healthcare provider training, advocacy training, and GI anxiety intervention.

Of the caregivers of dependent adults (n=215; 42%), most (n=138; 64%) reported their child experienced weekly GI symptoms in the past 3 months, of which the majority (n=97; 70%) reported symptoms for over 5 years. Two-fifths (n=88; 41%) reported their child had a GI diagnosis, and the same number symptoms often impairing. Most caregivers rated the recommendations as very/extremely important (n=135; 63%) and very/extremely impactful (n=157; 73%). Top recommendations included healthcare provider training, interdisciplinary care coordination model, and GI anxiety intervention.

Conclusions:

Most participants rated the recommendations as very/extremely important and impactful, with remarkable agreement across the three groups for the top priorities for future services-related research: healthcare provider training, advocacy training, interdisciplinary care coordination, and anxiety interventions. Future research should focus on pursuing these recommendations to enhance the lives of autistic people living with GI issues.

**436.028** Relationship between Imaging Evidence of Dopamine Transporter Binding Deficits and Functional Connectivity of the Striatum in Autism Spectrum Disorder

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Background:

In the nascent aging and autism literature, one of the most replicated findings across independent cohorts is increased risk for parkinsonism/Parkinson's disease (PD), as high as a 6-fold elevation of risk. As PD is characterized by the progressive loss of dopaminergic neurons, it is noteworthy that atypical dopamine activity has been observed in autistic adults and children, and animal models of autism spectrum disorder (ASD). The only FDA approved medications for ASD are the atypical antipsychotic medications risperidone and aripiprazole, which inhibit postsynaptic dopaminergic and serotonergic transmission to treat irritability. Studies using resting state functional magnetic resonance imaging (fMRI) show disruption in striatal circuits in ASD. However, no studies have examined the striatal PD biomarker, the dopamine transporter (DaT) scan™, or how abnormal dopamine function in the striatum may affect its functional connectivity (FC) with other brain areas in adults with ASD.

Objectives: In this pilot study, we aimed to evaluate the PD biomarker, DaTscan, in autistic individuals and functional connectivity between the striatum and other brain areas in autistic individuals with varying dopaminergic integrity on imaging.

Methods: DaT single photon emission computed tomography (SPECT) and resting state fMRI was collected in twelve participants (age range = 16-24) with ASD, and whole-brain seed-to-voxel striatal FC was calculated

Results: Five of the twelve participants were found to have focal deficits in striatal DaT uptake (Figure); therefore, participants were separated into abnormal (n=5) and normal (n=7) DaT groups for striatal FC analyses. The abnormal DaT group showed greater FC between right caudate and lateral occipital cortex, precuneus; between the bilateral putamen and right frontal pole, brain stem, precuneus; and between the bilateral accumbens and right precentral gyrus, juxtapositional lobule cortex, and right cerebellum.

Conclusions: These findings suggest that the PD biomarker, DaTscan, may be sensitive to high rates of clinical abnormalities in autistic individuals and that there is a relationship between focal striatal deficits in DaT uptake and greater striatal functional connectivity to areas involved with the motor control as well as sensory integration in ASD. These findings have the potential to inform future clinical trials in ASD but should be interpreted with caution until their relation to core symptoms is better understood in a larger sample. Additionally, examining how these findings changes with age will be critical to understand how the DaTscan and striatal FC may inform increased PD risk in autistic individuals.



436.029 Exploring Discrepancies in Self-and-Caregiver Reports across Autistic and Non-Autistic Adults

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Background: Previous research suggests autistic adults tend to agree more with their parents than non-autistic adults on traits like empathy and social functioning, though the direction of these effects remains unexplored (Sharp et al., 2023). Despite these patterns of agreement, discrepancies between self- and parent-reports are still common, as observed in broader research (De Los Reyes et al., 2015). These discrepancies may arise from autism-specific factors, such as social communication differences, which are central to the autistic experience. Furthermore, co-occurring mental health conditions, commonly seen in autistic individuals, can add additional complexity to symptom reporting (Curnow, et al., 2023; Sandercock et al., 2020; Trammell et al., 2013). Understanding these dynamic factors that contribute to discrepancies is crucial for accurate assessments and effective interventions.

Objectives: This study examines diagnostic differences (autism with/without co-occurring conditions versus non-autistic conditions) and autism-related social communication differences to determine their unique contributions to discrepancies in self- and parent-reports of social anxiety, empathy, and autism traits.

Methods: Participants included 211 adults ($Mage = 22.42$, $SD = 4.12$) who attended PEERS® for Young Adults, an evidence-based social skills program where parents serve as social coaches. Adults and their parents completed several measures before the program, including the Social Anxiety Scale (SAS; La Greca et al., 1988), assessing social anxiety; the Empathy Quotient (EQ; Baron-Cohen, 2004), measuring empathy levels; the Autism Quotient (AQ; Baron-Cohen & Wheelwright, 2004), evaluating autistic traits, and the Social Responsiveness Scale, Second Edition (SRS-2; Constantino & Gruber, 2012), assessing autism-related social communication differences. Discrepancy scores were calculated as differences between self- and parent-reports, with positive scores indicating higher participant-reported scores. Two multivariate analyses of covariance (MANCOVA) examined the effect of autism diagnosis on discrepancies and the effect of parent- and self-reported SRS scores, a continuous measure of autism-related social communication differences, on discrepancies.

Results: The model including autism diagnosis as a predictor revealed no significant effect of diagnosis on discrepancies in SAS ($p = .316$), EQ ($p = .558$), or AQ ($p = .298$). In contrast, both parent and self-reports of autism-related social communication differences significantly predicted discrepancies in social anxiety, empathy, and autism traits (all p 's $< .05$). As parents reported higher SRS scores, participants reported higher SAS ($B=0.188$) and AQ scores ($B=0.116$) but lower EQ scores ($B=-0.110$) than their parents. Conversely, when adults reported higher SRS scores, they reported lower SAS ($B=-0.116$) and AQ scores ($B=-0.125$) but higher EQ scores ($B=.0219$) than their parents.

Conclusions: Findings suggest that an autism diagnosis may not always result in self- and parent-report discrepancies, indicating that diagnosis alone does not explain these differences. Instead, autism-related social communication differences emerged as a key transdiagnostic predictor, highlighting notable variations in reported empathy and social functioning. This treatment-seeking sample may not reflect the general population, as participants and their parents mutually committed to attending social skills programming together, potentially indicating a level of pre-existing agreement and understanding. Future studies could explore how such discrepancies manifest among individuals who are not engaged in a program accompanied by a parent.

436.031 Sensorimotor and Executive Differences in Autistic Individuals with Borderline IQ

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Background: Our group and others have repeatedly demonstrated reduced saccade accuracy, increased variability of saccade accuracy, and increased rates of inhibitory control errors in autistic individuals (e.g., Schmitt et al., 2014). These studies implicate basic sensorimotor and executive processes, respectively, though few studies have directly examined sensorimotor and executive processes in autistic individuals with lower IQs. Determining the extent to which sensorimotor and executive processes vary as a function of IQ in autism is important for defining neurodevelopmental mechanisms and guiding more individualized support strategies.

Objectives: To explore relationships between IQ, sensorimotor behavior, and inhibitory control in a preliminary sample of individuals with borderline IQ relative to autistic individuals with average or above average IQ.

Methods: A preliminary sample of 18 autistic participants completed eye movement tests of sensorimotor and executive control. Six autistic individuals with borderline IQ (71-84) were compared to six age-matched autistic individuals with average IQ (85-115) and six with above average IQ (116-130). To examine sensorimotor control, participants completed a visually guided saccade task in which they looked reactively to visual targets presented at 12 or 24 degrees of visual angle. Saccade latency, accuracy (error), and velocity were examined. To test executive control, participants completed an antisaccade task during which visual targets were presented at 12 or 24 deg of visual angle and participants were instructed to make an "antisaccade" to the opposite hemifield. Latency of correct antisaccades and proportion of trials in which participants looked toward rather than away from targets were examined.

Results: Autistic individuals with borderline IQ showed greater error of their reactive saccades ($M=1.58$, $SD=.43$) than autistic individuals with average or above average IQ ($M=1.13$, $SD=.23$, $t(10)=2.24$, $p=.05$, Cohen's $D=1.29$). IQ groups did not show differences in saccade latency or velocity. Similarly, the borderline IQ group was more variable in their degree of error ($M=1.31$, $SD=0.26$) than the above average IQ group ($M=.944$, $SD=.26$), $t(10)=2.43$, $p=.04$, Cohen's $D=1.4$. During the test of executive control, autistic individuals with borderline IQ showed similar antisaccade latencies and error rates as autistic individuals with average or above average IQ.

Conclusions: Autistic individuals with borderline IQ show reduced saccade accuracy and increased saccade accuracy variability than autistic individuals with average IQ suggesting impairments in the ability to execute rapid sensorimotor behaviors and modulate precision over time based on sensory feedback information. Autistic individuals with borderline IQ did not demonstrate differences in antisaccade error rates suggesting that sensorimotor systems, but not executive systems, may be selectively impacted in autistic individuals with lower IQs. Results indicate that cerebellar-brainstem circuits involved in supporting sensorimotor behaviors may be more severely disrupted in autistic individuals with borderline IQ.

436.032 Sexual Functioning of Autistic People in Menopause and the Relationship with the Reproductive Hormones, Sensory Sensitivities, Camouflaging and Other Autistic Traits

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Background: Sensory processing disorders (SPD) are associated with poorer quality of life, contributing to fluctuation in well-being, daily functioning, and health (Cost-Lopez et al. 2021). SPD could be associated with susceptibility to develop a wide range of psychiatric symptoms and disorders, including depressive and anxiety disorders (Engel-Yeger et al. 2015), alexithymia, internalizing disorders and emotional dysregulation (McMahon et al. 2019). Emerging literature on menopause in autism suggests that the interplay with sensory processing and modulation worsen menopausal symptoms and make every day functioning more difficult for autistic and other neurodivergent populations. The menopausal complaints are associated with higher levels of depression and autistic traits (Groenman et al. 2022; Rynkiewicz et al. 2023). Quantitative data suggest that autistic people experience more severe menopausal symptoms (Groenman et al. 2022; Rynkiewicz et al. 2023), and qualitative reports describe a breakdown in established coping skills which can develop additional psychiatric disorders and symptoms including self-harm and suicidal behavior (Moseley et al. 2021; Rynkiewicz et al. 2024).

Objectives: To investigate if the severity of menopausal symptoms experienced by autistic people were linked to the sensory issues, autistic traits and the levels of reproductive hormones.

Methods: The participants were five white menopausal women, with no intellectual disability (ID), diagnosed with ASD, and including one case from ECHO Autism training on best-practice recommendations. ADI-R, the Autism Clinical Interview for Adults (ACIA), ADOS-2 (Module 4), and self-reported questionnaires: Highly Sensitive Person Scale (HSP Scale), Adolescent/Adult Sensory Profile (AASP), GQ-ASC/Q-ASC (Girls' Questionnaire for ASC) for adult women, Menopause-Specific Quality of Life (MENQOL) Questionnaire were used. The HSP Scale was translated to Polish and validated by the researchers from the Department of Adult Psychiatry, Poznan University of Medical Sciences (PUMS). The researchers from UR and PUMS were formally trained on ACIA. In addition, the full gynecologic examinations, including cytology and hormonal lab testing were performed. The study was approved by the University of Rzeszow (UR) Bioethical Commission (№ 2024/02/007), and patients gave their informed consents.

Results: MENQOL total score, psychosocial and sexual score correlated positively with GQ-ASC total score. MENQOL sexual score correlated positively with AASP Sensory Sensitivity and GQ-ASC camouflaging, but negatively with GQ-ASC Interests. Estradiol levels correlated negatively with MENQOL vasomotor and psychosocial score and FSH, LH and cortisol level correlated positively with MENQOL sexual score. No relation was found between MENQOL and HSPS. Gynecological assessment showed no abnormalities.

Conclusions: Severity of menopausal symptoms was related to intensity of autistic traits. Psychosocial functioning in menopause worsens as the severity of autism symptoms increases. Higher sensory sensitivity deteriorates sexual menopausal symptoms. A strategy for dealing with sexual symptoms of menopause might be intensification of camouflaging. Low estradiol levels worsens vasomotor symptoms of menopause. Although the results are preliminary, they are promising and emphasize the importance of menopause research in autism.



436.033 What Influences the Participation in Physical Activity for Autistic Adults?

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Background: Autism spectrum disorder (ASD) is a lifelong neurodevelopmental condition characterised by differences in social communication, and restricted or repetitive behaviours and interests. Autistic adults experience higher rates of chronic health conditions and premature mortality, often attributed to suspected insufficient physical activity. Despite this, limited research has investigated the factors influencing physical activity engagement in autistic adults.

Objectives: This study aimed to explore the factors influencing the types, patterns and volumes of physical activity in autistic adults.

Methods: A total of eight autistic adults (female $n=4$; male $n=3$; non-binary $n=1$). The participants were aged between 23 and 48 ($M=33.5$; $SD=7.9$). Participated in face-to-face semi-structured. In the seven days prior to interview the participants wore an ActivPAL accelerometer and they completed an online daily diary. The interview was guided by a physical activity report from the ActivPAL accelerometer and their daily diary. Interview were audio recorded and transcribed verbatim. The data were analysed using Interpretative Phenomenological Analysis.

Results: The analysis identified seven themes that impacted engagement in physical activity. The first theme, *management of a personal energy quota*, outlined how participants needed to balance the demands of their everyday life to consider engaging in physical activity. The energy quota was influenced by work, poor sleep and masking. The , *adapting physical activity to meet personal needs*, described the relationship between an individual's sensory thresholds, the environment, and the type of physical activity. Autistic adults also noted how their co-occurring challenges influenced their participation in physical activity. Theme three, the *influence of social pressures and connections*, outlined the impact of social connections on participation in physical activity. Strong positive social connections supported participation, but previous experience of bullying was a negative influence. Theme four, *sense of fulfilment through activity*, outlined having a personal goal helped autistic adults participate in physical activity. In outlining theme five, *mandatory and incidental physical activity*, participants noted that they had previously been coerced into participating in physical activity. The autistic adults also noted that they also participated in physical activity to complete a preferred activity. The sixth theme, *the role of sedentary behaviour*, outlined how autistic adults' participation in physical activity was influenced by their preference for desk-based tasks.

Conclusions: The findings of this study provide insights into what influences autistic adults' participation in physical activity. It appears that autistic adults must be aware of balancing their personal energy quota, which is affected by other aspects of life, in order to engage in physical activity. The findings of this study highlight the need to consider how the broader environmental, social, and sensory contexts interact with and influence the engagement of autistic adults in physical activity. These findings provide valuable insights into the barriers and facilitators influencing physical activity participation among autistic adults, which may inform further research and support the development of tailored interventions to promote physical activity and overall well-being in this population.

436.034 Social Anxiety in Autistic Adults: Acceptability and Tolerability of Cognitive-Behavioural Methods and the Role of Camouflaging.

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Background: A notable concern within the autistic community is the high incidence of social anxiety disorder (SAD), which can negatively impact social well-being and quality of life. This paper aims to evaluate the applicability of cognitive-behavioural models of therapy in addressing social anxiety in autistic individuals. Additionally, there has been some debate that such therapies may enhance camouflaging, but there is very limited data on this issue.

Objectives: This paper aims to evaluate the applicability of a modified cognitive-behavioural model of therapy to address social anxiety in autistic adults.

Methods: The author provides a brief overview of the published evidence linking cognitive-behavioural mechanisms of social anxiety to autistic adults. They then present a qualitative and quantitative study exploring the experiences of autistic adults when they receive a social anxiety cognitive-behaviour group therapy program. This analysis breaks down different aspects of the therapy process to receive feedback. Finally, the author presents a study that examines how camouflaging changes following therapy.

Results: The review found very few studies that test relevant cognitive-behavioural mechanisms of therapy for autistic adults. Both qualitative and quantitative data from the authors own study largely support the implementation of cognitive behavioural practices for autistic adults, with some adaptations and modifications needed. There was no evidence that camouflaging was increased by cognitive-behavioural therapy for social anxiety with a skills component included. In addition, positive feedback was consistently received for the skills aspect of the program.

Conclusions: The findings suggest that cognitive-behavioural models of social anxiety have potential to provide a safe and effective approach for reducing social anxiety in autistic adults. There is a limitation of data, further studies will be needed, and accommodations and adaptations are necessary. The combination of quantitative and qualitative data show the multifaceted generally positive impact of the intervention in treating social anxiety in autistic adults, particularly with the modifications discussed.

436.035 Social Behaviors Among Preschoolers with Vision Impairment (VI), with Autism Spectrum Disorder (ASD) and with Typical Development (TD): Implications for Diagnosis and Intervention

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Background:

Vision impairment (VI) is a sensory disability that affects many areas of development, including social development (Vann et al., 2015; Hobson, 2005). Although research reveals an overlap between the profiles of social behaviors in children with vision impairment and those characteristic of children with Autism Spectrum Disorder (ASD), the nature of this phenomenon has not been sufficiently examined (Do et al, 2017).

Objectives:

The main aim of this study is to compare profiles of social behavior of preschool children with VI, those with ASD and typically developing children (TD). This unique comparison among these three groups of children is necessary because social behaviors are quite variable in preschool children.

Methods:

The participants in this study were 120 preschool children, divided equally into three research groups: 40 children with congenital VI, 40 children with ASD, and 40 children with TD, all matched on gender and chronological age. The two clinical groups (VI and ASD) were also matched on mental age. Social behavior was measured using the Social Responsiveness Scale-2nd edition (SRS-2: Constantino, 2012) and child behaviors were evaluated by the Child Behavior Checklist (CBCL: Achenbach & Rescorla, 2000), while adaptive behavior was characterized through parent interviews (Vineland Adaptive Behavior Scales-3, VABS-3: Sparrow et al., 2005).

Results:

Findings suggest that children with VI face similar challenges to children with ASD in receptive and expressive language as well as in adaptive personal skills, anxiety/depression and attention problems. However, play skills and aggressive behavior of children with VI were similar to those with TD. Findings from this study provide support for the claim that children with VI have a separate profile of social skills than that of those with ASD and those with TD, even in early childhood. VI social profile displays less intense, less frequent and less persistent social deficits compared to the social profile of the ASD group, and more than the profile of children with TD. These results are essential for both diagnostic clarity and development of appropriate interventions strategies.

Conclusions:

Preschool children with VI present various challenges in language, adaptive, emotional, and social behavior. Although there are similarities in those challenges among the VI and ASD groups, the social profile of children with VI is unique and is influenced by visual experience which change with maturation. The findings from this study suggest that there is a distinct social profile of children with VI, which reflects a necessary adjustment to the environment due to their visual deficits. Therefore, diagnosticians should be made aware of this unique social behavior profile when an ASD diagnosis is being considered for a child with VI. In addition, parents and professionals who work with preschool children with VI must be familiar with their social profile in order to optimally meet their social needs.

436.037 Socioeconomic Disparities Among Autistic Individuals in Mid- to Late-Adulthood in a Matched Sample with Comparable Educational Attainment in the UK

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Background:

Individuals with autism spectrum disorder (ASD) are associated with multifaceted disadvantaged socioeconomic status, partially attributable to worse education. Evidence is scarce on the disparity in their adulthood unexplained by educational attainment.

Objectives:

This study aims to investigate socioeconomic disadvantages experienced by autistic individuals in the United Kingdom, given comparable educational attainment.

Methods:

Participants were identified from the UK Biobank study. We first identified individuals with ASD diagnosis, each of whom were randomly matched to up to 10 participants without ASD diagnosis by birth year, age, sex, race and education level. Multivariate linear regression analysis was applied to explore the relationship between TDI, employment status, income, and years of education among individuals with ASD compared to those without ASD.

Results:

The study included 672 ASD cases (66.8% male; mean age 51.5 [SD, 7.9]) and 6,720 matched non-autistic individuals. The average years of education for individuals was 15.2 (SD, 3.8) years, which corresponds to the completion of A levels/AS levels or an equivalent level. Of the 38.5% who took the cognitive tests, autistic individuals exhibited even higher fluid intelligence compared to the non-ASD. In the UK Biobank cohort, ASD individuals, despite similar educational levels, showed significantly lower TDI scores, employment rates, and income compared to non-ASD individuals. This disparity was evident across health, education, crime, and residential outcomes in a subsample of England residents with available data.

Conclusions:

Individuals diagnosed with ASD exhibit significant socioeconomic disadvantages compared to their non-ASD counterparts, particularly in mid-to-later adulthood. Access to suitable educational opportunities is instrumental in reducing the disadvantage.

436.038 Studying Recruitment and Retention in Randomized Controlled Trials Involving Autistic Adults: Lessons on Trial Design and Conduct

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Background:

Numerous studies have documented significant physical and mental health inequities in autistic adults compared to the non-autistic population. Addressing these inequities requires a robust evidence base, such as that provided by randomized controlled trials (RCTs) of treatment interventions. High-quality, well-powered studies of effective health interventions for autistic adults remain scarce, and prior RCTs involving autistic adults are often limited by small sample sizes. Poor recruitment and retention rates are major contributors to the failure of many RCTs to achieve sufficient power within the allocated time and budget. Psychosocial factors contributing to hesitancy to enrol to RCTs, as well as failure to complete participation are context- and population-specific, justifying further examination in trials involving autistic people. Understanding such factors is crucial to the recruitment success of future RCTs with the autistic population.

Objectives:

1) To systematically review barriers and facilitators to recruitment and retention in RCTs involving autistic adults; 2) To design and implement strategies to overcome such barriers to recruitment in a large trial involving autistic adults.

Methods:

We conducted a field-wide systematic review to assess whether previously conducted large RCTs in adult autism research effectively recruited and retained participants, and to identify reported barriers and facilitators to recruitment and retention. Additionally, we describe strategies from the QuinteT recruitment intervention (QRI) which uses a mixed-method approach to understand and optimize recruitment to RCTs in real time, and their application for the first time in a large complex medication trial for autistic adults (STRATA).

Results:

Most registered and published trials with autistic adults were small feasibility/pilot studies and did not report on planned sample sizes. Our systematic search identified 33 larger RCTs that collectively recruited 2,664 autistic adults, and retained 86% of their sample on average. Most successful large trials employed international recruitment efforts, leveraging established networks, press releases, community groups, and social media for advertising. Achieved samples report an underrepresentation of females and ethnic minorities. The QRI in the STRATA RCT identified key factors that contributed to recruitment success: 1) enthusiasm from both research teams and the autistic community for obtaining high-quality evidence about mental health treatments, and 2) commitment to co-production of the protocol, and making adaptations (e.g. remote consent/participation). Inconsistencies in communication from trial sites was identified as a key challenge. Specific strategies to address these challenges were developed and implemented in real time which translated to successful recruitment.

Conclusions: Most RCTs with autistic adults are small and not accompanied by pre-registered protocols or sample size calculations. However, our systematic review suggests that it is possible to successfully recruit to and retain autistic participants in large RCTs. These results, combined with our experience implementing the QRI in the STRATA RCT show that challenges to recruitment and retention in RCTs involving autistic adults can be identified and addressed with true co-production with autistic people, clinicians, and researchers.

436.039 "You're Not Going to Get Hired If You Just Act Autistic": Perspectives of Autistic Adults in Canada on Masking in Job Interviews

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Background: Autistic adults in Canada face substantially higher rates of unemployment compared to the general population (Statistics Canada, 2017). Various barriers to autistic adults attaining employment exist (Maras et al., 2021; Sarrett, 2017). In particular, traditional job interviews can be challenging for autistic adults to navigate, often placing considerable emphasis on social conventions and interpersonal dynamics (Huffcutt, 2011; Vincent & Fabri, 2020). To improve their interview performance and conform to these expectations, autistic adults have reported concealing their autistic traits, or masking (Finn et al., 2023; Hull et al., 2017). However, previous research has established that masking is taxing and can negatively impact wellbeing (Bradley et al., 2021).

Objectives: The aim of this study was to explore the experiences and perspectives of autistic adults in Canada about masking in job interviews.

Methods: Twenty-three autistic adults (11 male, 6 female, 6 non-binary/gender-fluid/transgender) ages 19 to 59 years old ($M=31.65$, $SD=11.84$) participated in this study. Participants completed the Autism Spectrum Quotient (AQ) and a demographics questionnaire (see Table 1). They were asked to discuss their experiences with masking in job interviews either over a Teams call ($n=11$) or using a written survey ($n=12$). The authors, consisting of an autistic community member, a non-autistic psychologist with experience supporting autistic adults in their vocational development, and non-autistic researchers, collaboratively wrote the study interview questions. Following an interpretive phenomenological analysis approach, participant responses were analyzed using thematic analysis (Braun & Clarke, 2006). Codes generated independently by two authors were compared, and themes were developed from these codes.

Results: Six themes were generated: (1) Masking is expected and necessary, (2) Masking to appear “normal”, (3) Masking uses a lot of my resources, (4) Masking in the interview is just a temporary solution, (5) Masking is automatic, and (6) “I’m generally against masking”. A complete list of themes, subthemes, and a description of themes is provided in Table 2.

Conclusions: The findings highlight the pressure participants feel to mask their autistic identity during interviews and the associated costs of this masking. All female and gender-diverse participants, along with roughly half of male participants, reported masking their autism in job interviews. Many described masking as necessary for securing employment and detailed the considerable effort they exert to mask, including scripting their responses, practicing their mask with others, and consciously monitoring their behaviours and communication style. Participants indicated that masking is exhausting, feels inauthentic, is inconsistent with their internal experience, and is unsustainable to maintain in the workplace following the interview. To improve the accessibility of job interviews and alleviate the pressure to mask, participants offered a number of suggestions for employers, including providing remote interview options, incorporating skills-based assessments in the hiring process, identifying themselves as welcoming of neurodivergent employees, and initiating discussions about accommodation. Incorporating these suggestions into common practice is important for improving the quality of life for autistic adults (Mason et al., 2018).



436.040 “I Feel like I Don’t Fit in the World”: Self-Identified Autism, Diagnosis and Mental Health Challenges in Adults in Spain

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Background:

Autistic individuals are more likely to experience anxiety and depression than non-autistic individuals (Sedgewick et al., 2020), with autistic women and non-binary individuals reporting higher rates of mental health issues compared to autistic men (Sedgewick et al., 2020). Autistic adults also exhibit a higher prevalence of psychiatric conditions compared to those with other developmental disabilities (Tint et al., 2023). Gender differences influence the presentation of autism, with autistic women showing more sensory symptoms and self-reported autistic traits but fewer socio-communication difficulties than men (Lai et al., 2011). In contrast, autistic men display more repetitive behaviors (Wilson et al., 2016). These findings underscore the importance of gender-specific diagnostic tools and interventions for autistic adults.

Objectives:

This study aimed to compare the prevalence of psychiatric co-occurrences in autistic and non-autistic adults undergoing diagnostic evaluations in Madrid, Spain, with a focus on gender differences.

Methods:

A cross-sectional study was conducted with 101 adults (autistic: $n=79$, 78.2%; non-autistic: $n=22$, 21.8%) attending a nonprofit organization’s diagnostic services. Participants completed the ADOS-2, Beck Anxiety Inventory, and Toronto Alexithymia Scale. Data on previous assessments, use of mental health services, and psychiatric diagnoses were collected.

Results:

Among those who self-identify as autistic people, 78% ($n=79$) received an autism diagnosis. This group was predominantly female (61%, $n=49$), with an average age of 30.7 ($SD=11.8$) and a significant portion having college degrees (48%, $n=38$). Non-binary individuals were more represented in the autistic group (15.2%, $n=12$), though these differences were not statistically significant. Autistic individuals had significantly higher autism symptoms ($t=10.57$, $p<.001$), alexithymia ($t=4.29$, $p=.001$), and sensory issues ($\chi^2=4.28$, $p=.039$) compared to non-autistic individuals. Autistic women reported significantly more anxiety ($F=10.89$, $p=.002$) and autism symptoms ($F=18.44$, $p<.001$) than autistic men and non-binary individuals.

Conclusions:

This study highlights the prevalence of psychiatric co-occurrences among autistic adults in Madrid, with many receiving a first-time autism diagnosis in middle adulthood. It is a major challenge to provide access to diagnosis in adults, as there is a growing demand (Happé et al., 2016) and waiting a long time to get a diagnosis often means not being able to count on the support and treatments that could improve the emotional wellbeing of autistic adults. Our results show that more than 50% of autistic adults do not have treatment in the area of mental health at the time of receiving the diagnosis.

The lack of diagnosis leads to a worsening of the clinical conditions that co-occur with ASD, increasing difficulties in everyday life situations, the perception of loneliness and sometimes suicidal ideation or attempts. (Cassidy et al., 2020; Black et al., 2023). Gender differences play a crucial role in the clinical presentation and mental health outcomes of autistic individuals. Public health policies should prioritize improving diagnostic access and developing tailored diagnostic tools for adults, particularly women, to reduce the long-term impact of undiagnosed autism, including mental health challenges like anxiety and depression. Access to a diagnosis is a fundamental right that enhances self-understanding and improves quality of life through appropriate community support and services.

436.041 Task Collaboration between Dyads with and without an Autistic Partner: A Multi-Level Model

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Background:

As autistic people transition to adulthood, fostering neurodiversity in the workforce becomes crucial. Competitive workplaces often demand proficiency in communication and teamwork skills, which can manifest differently in individuals with autism. Autistic adults who face challenges in collaborative problem-solving in the workplace may encounter poor employment outcomes. However, from a strengths-based perspective, autistic adults offer valuable attributes—such as being detail oriented—that benefit the workforce. This highlights the need for research to develop strategies that support autistic adults in collaborative work environments.

Objectives:

This study explored the behavioral interchanges of neurodiverse (non-autistic adults [NA]-autistic adults [AA]) and neurotypical (NA-NA) dyads during collaborative assembly tasks. Multi-level modeling (MLM) determined how collaboration changed over time, across varying difficulty levels, and between dyad types.

Methods:

The study included 46 participants (10 AA, 36 NA) with a mean age of 23.8 years ($SD=5.6$; range=18–44), forming 23 gender and age-matched dyads (10 NA-AA, 13 NA-NA). These dyads collaboratively assembled four Lego sets (i.e., four tasks) at two difficulty (or constraint) levels: medium (Tasks 1 and 2) and high (Tasks 3 and 4). For Task 1, participants were assigned the roles of builder (responsible for assembly) and assistant (provided support without assembling). Roles were reversed for Task 2. For Task 3, roles were engineer (provided verbal instruction without handling pieces) and builder (assembled without viewing written instructions). Roles were reversed for Task 4. Collaboration was assessed by evaluating dyadic behaviors in one-minute epochs across five dimensions (Meier et al., 2007): Collaboration Flow, Sustaining Mutual Understanding, Knowledge Exchange, Argumentation, and Cooperative Orientation. Each dimension was coded as +2=very good, +1=good, -1=bad, or -2=very bad for each epoch and averaged across the five dimensions (mean task length=11.67 min, mean collaboration=1.71 [$SD=0.44$]). Two graduate students independently coded each dyad, and any discrepancies were resolved through consensus discussion with a third coder.

Results:

Repeated measures of collaboration nested within dyad types were examined via MLM. There were significant increases in collaboration within the task across the whole observation ($F=4.39$, $p=.036$), driven by a Time x Dyad Type interaction showing significant increases in NA-AA dyads ($F=18.67$, $p<.001$; Figure 1). There were two significant main effects: Constraint Level ($F=50.78$, $p<.001$), indicating greater collaboration during the high vs. medium constraint tasks, and Dyad Type ($F=12.74$, $p=.001$) with NA-AA dyads exhibiting lower overall collaboration than NA-NA dyads. Post-hoc tests for a significant Constraint Level x Dyad Type interaction ($F=32.93$, $p<.001$) indicated that collaboration was lower during medium constraint tasks for both NA-AA ($p<.001$) and NA-NA ($p=.007$) dyads, whereas NA-AA dyads started lower and demonstrated steeper increase from medium to high constraint (Figure 2).

Conclusions:

These results suggest that for both dyad types, collaboration on shared tasks improves as the roles become more defined. Additionally, neurodiverse dyads especially benefit from an increase in role structure. This study provides preliminary evidence on how neurodiverse collaboration can be supported. Future research should examine individual-level factors (i.e., perceived task difficulty) and include AA-AA dyads to further understand collaboration dynamics.

**436.042 The Association between Autistic Traits and Trajectories of Anxiety in Middle-Aged and Older Adults: A Growth Mixture Model Analysis**

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Background: Anxiety is commonly experienced by autistic people (Vasa et al. 2020). However, existing research into anxiety beyond midlife is scarce relying mostly on cross-sectional approaches and leaving much about the longitudinal course of anxiety in this population unknown (Mason et al., 2022).

Objectives: This study explored the relationship between autistic traits and longitudinal trajectories of anxiety using a large sample of middle-aged and older adults. The analyses within this abstract (which uses data from 2014 to 2020) will be updated to include additional data from 2014 to 2024 ahead of the INSAR 2025 Annual Meeting.

Methods: This study uses annually collected longitudinal data from the PROTECT cohort, an ongoing online study examining ageing and health. In our provisional analyses, a large sample of 13,927 middle-aged and older adults (aged 50–100 years; median age = 62) completed measures related to autistic traits (PROTECT Autistic Spectrum Traits questionnaire, Stewart et al., 2021) and current anxiety symptoms (Generalised Anxiety Disorder questionnaire, GAD-7; Spitzer et al., 2006). Among the provisional sample, 210 (~1.5% of the total sample; 73.3% female) endorsed high autistic traits (Autism Spectrum Trait: AST group) and 13,057 (~93.8% of the total sample; 75.8% female) reported no autistic traits (Control Older Adults: COA group). Growth mixture modelling (GMM) was employed to identify latent classes of anxiety symptom trajectories. The association between AST and anxiety class membership was examined using multinomial logistic regression.

Results: Provisionally, GMM analysis determined a three-class solution provided the best fit for the anxiety trajectories in this sample based on several fit indices (AIC = 292981, BIC = 203154, LMR and ALRT $p < .001$). The majority of participants exhibited persistently low anxiety symptoms that fell into the ‘minimal to mild’ range of the GAD-7 measure: ‘minimal’ (scores ≈ 1 ; 78.6%, $n = 10,674$) and ‘mild’ (scores ≈ 3 ; 18.4%, $n = 2,230$). A small proportion of the sample experienced sustained ‘moderate’ anxiety symptoms (scores ≈ 7 ; 3.0%, $n = 363$). AST participants were found in all three trajectories but were more likely to be in the highest anxiety class (OR adjusted = 1.61, $SE = 0.24$, $p < .001$).

Conclusions: These provisional results suggest that middle-aged and older adults who endorse elevated autistic traits are at higher risk of experiencing greater levels of anxiety over time. These findings highlight the need for comprehensive mental health support for ageing autistic populations. Future studies using more diverse samples, including those with diagnosed autism, are required to better understand longitudinal anxiety trajectories among this heterogeneous population.

436.043 The Big Move: Incidence, Timing, and Predictors of Residential Status Among Adults with Autism and Developmental Disabilities

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Background:

Many adults with autism and other developmental disabilities (DDs) continue living in the family home well into adulthood (Dudley et al., 2018). Moving out of the family home can promote autonomy and well-being, but the transition is often surrounded by anxiety and unmet service needs. Further, residential outcomes for this population vary by co-occurring intellectual disability (ID): those with ID may require supported housing (e.g., group home, supported living arrangement), while those without ID are more likely to transition to independent living. Though housing is a key aspect of adult life, little existing research examines residential outcomes for adults with autism and DDs.

Objectives:

Leverage a well-characterized longitudinal cohort of adults with autism and other DDs ($n = 139$, $M_{age} = 31.46$ years, $SD = 2.78$; $n = 111$ autistic; $n = 28$ non-autism DD) to examine:

- 1) The percentage who live in their family home, in supported housing or independently (i.e. alone or with partners/roommates).
- 2) Associations between individual and sociodemographic characteristics with the timing and odds of transitioning out of the family home for participants with and without ID.

Methods: Participants were consecutive referrals to autism/neurodevelopmental clinics identified between ages 2-3 and followed for three decades. Given distinct residential transitions, analyses separately investigated participants with ID ($IQ < 70$) and without ID ($IQ \geq 70$; Table 1). Cox proportional hazards models assessed factors influencing the likelihood of leaving the family home, including employment, demographics, and autism symptomatology.

Results: By age 32, 51% of participants lived in their family home (Table 1). Among those who moved away ($n = 68$), roughly 30% of individuals without ID left home at age 18. Adults with ID moved away at varied ages (Figure 1). For individuals without ID, cox models revealed that having a college degree or higher ($B = 1.858$, $p < 0.001$) most significantly increased odds of transitioning, followed by having a mother with a college degree ($B = 0.920$, $p = 0.033$). For participants with ID, being from a rural area significantly decreased odds of transitioning ($B = -1.181$, $p = 0.029$). In contrast, having a mother with a college degree significantly increased odds ($B = 1.757$, $p = 0.005$). Interestingly, higher IQ decreased the odds of leaving home for individuals with ID ($B = -0.041$, $p = 0.011$). Race, autism symptomatology, and employment did not predict residential transitions for either group.

Conclusions: For adults with autism and other DDs without ID, having a college education was the single largest predictor of living independently. For adults with ID, maternal education was the largest predictor of transition. Notably, IQ was significantly negatively associated with residential transitions for adults with ID, but not for those without. There may be greater urgency from family and service systems to expedite residential transitions for individuals with more pronounced needs. Results may also underscore a call for greater transition support especially for families with less educational resources and from rural areas. As this population ages, there is a pressing need to better understand residential transitions and factors associated with positive outcomes.



436.044 The Experiences of Direct Support Professionals Working with Autistic Adults: An Exploratory Study

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Background: Direct support professionals (DSPs) are hired to provide adequate and meaningful habilitative services to autistic adults. DSPs work with many autistic adults who have varying levels of support needs. It is suspected that DSPs may feel they are not being set up for overall success when working with autistic adults due to their organization's inadequate onboarding and lack of trainings.

Objectives: To explore the perceived quality of support DSPs receive in the field while working with autistic adults and how they navigate challenges.

Methods: This study uses a qualitative study approach featuring semi-structured interviews of 5 direct support professionals who were recruited through a snowball sampling approach. Interviews were transcribed by a HIPAA compliant transcription service. One independent coder, plus peer debrief, implemented the constant comparative method associated with a grounded theory approach. Codes and themes will be developed accordingly.

Results: Six major themes emerged: **(1) Challenges.** DSPs shared their experiences with how challenging their role is since "you don't know what you're going to be faced with on a day-to-day basis." Challenges ranged from barriers "being prepared to de-escalate a community that doesn't fully understand someone with potentially autism" up to situations that don't "go over too well in the community setting and we got the cops called on us." **(2) DSP Role.** DSPs are not always trained to but are expected to provide supports that vary "from individual to individual [for] folks on the spectrum, it's very individualized." **(3) Lack of Professional Support.** Service provision expectations of DSPs can be negatively impacted by a lack of professional supports which includes instances where "the training is -- it might not be extensive enough." **(4) Lack of Understanding.** DSPs are then left with a lack of understanding when it comes to supporting autistic adults. This can create situations where DSPs feel like "how can I learn or be taught from a book that's an understanding for you and not for me if I haven't worked with this person hands-on?" **(5) Successes.** While challenges are critical to examine, successes are also worthy of noting. DSPs who are empathetic and show passion in their role can lead to successful outcomes for autistic adults. "I think being willing to listen, being willing to check in with yourself, make sure that your bias is not affecting their ability to succeed, and knowing that success looks different to everybody." **(6) Supportive Agencies.** The success of DSPs is fostered through supportive agencies. "The organization support is very crucial as well. So, the family support, the organization support, and the -- yeah, the support that you receive from all stakeholder, the -- it matters. So, yes, to let, to make you be a successful DSP."

Conclusions: Well-equipped direct support professionals are crucial for adequate service provision for autistic adults receiving supports through Medicaid home and community-based supports. Future research should focus on the complexities of service provision and the DSP role. Researchers should explore ways to create more comprehensive and person-centered approaches to service implementation.

436.045 The Interaction between Autistic Traits and ADHD Symptoms in Taiwanese Adults: A Network Analysis

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Background:

Autism and ADHD symptoms tend to co-occur among children and adolescents. The shared genetic architecture and neurocognitive deficits may contribute to the similar manifestations of some symptoms between these two diagnostic entities. Network analysis is a useful tool to unpack the overlap and to reveal interactions between individual autistic traits and ADHD symptoms. The results of previous network analyses indicated that autism and ADHD symptoms among children could be divided into two separate constructs. However, the cross-condition associations of autism and ADHD in adults has been understudied in Asian countries.

Objectives:

This study aimed to examine the interaction between autistic traits and ADHD symptoms using network analysis in a sample of Taiwanese adults.

Methods:

A total of 659 adult participants (age range 20-83 years, mean age 34.49 ± 11.08 years, 46.1% male) were recruited from the psychiatric outpatient and the physical examination department of two teaching hospitals, as well as a university in Taiwan. Of them, 167 participants reported to have psychiatric disorders, and 13 reported to have autism. The Chinese version of Social Responsiveness Scale-2 (SRS-2) adult (self-report) form was used to measure the participants' autistic traits, and the Adult ADHD Self-Report Scale (ASRS) was used to measure their ADHD symptoms. The eLasso procedures was adopted to estimate undirected networks of autistic traits and ADHD symptoms.

Results: The 65 items of SRS-2 were grouped into two factors: Social Communication and Interaction (SCI, 49 items, Cronbach's alpha 0.95–0.96) and Restricted Interests and Repetitive Behavior (RRB, 16 items, Cronbach's alpha 0.86–0.89). There were 53 nonzero edges (34.64% of all 153 possible edges) between two ADHD symptoms, 198 nonzero edges (4.71% of all 2,080 possible edges) between two autism traits, and 18 nonzero edges (1.54% of all 1170 possible edges) between one ADHD and one autistic trait. Nonparametric Kruskal–Wallis test indicated significant differences in edge weight between ADHD–ADHD, autism–autism, and ADHD–autism connections ($\chi^2 = 13.04$, $p = 0.001$); pairwise Wilcoxon test accounting for multiple comparisons indicated ADHD–autism connections were significantly weaker than ADHD–ADHD ($p = 0.003$) and autism–autism ($p < 0.001$) connections. There was no difference on the strengths between ADHD–ADHD and autism–autism connections ($p = 0.901$). Of the 18 nonzero ADHD–autism connections, inattention symptoms and hyperactivity symptoms did not differ in number of edges (8 vs. 10) and group edge weight ($W = 27$, $p = 0.267$). As for the two factors of autistic traits, SCI contributed to most of the edges with ADHD symptoms compared to RRB (17 vs. 1).

Conclusions:

Our findings indicate that autistic traits and ADHD symptoms remain segregated in adult individuals. The strengths of ADHD–ADHD symptom connection weakened along with the partial remission in developmental trajectory. Autistic traits in social communication domain explained most of the associations between autistic traits and ADHD symptoms in adults.

436.046 The Phenomenology and Network Connectivity Alterations of Low Dose Psilocybin in Autistic and Non-Autistic Adults
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Background: Accumulating evidence has implicated the serotonin system in the underlying neurobiology of autism. Differences in the serotonin system are reported across organisational levels of autistic brain function, including alterations in the cortical expression of 5HT_{2A} receptors and the connectivity of resting-state networks. Both of which are well-established targets of the classic psychedelic and partial 5HT_{2A} receptor agonist psilocybin. For example, cortical 5HT_{2A} receptor activation is primarily responsible for the subjective (or 'psychedelic') effects of psilocybin, which have been associated with the patterns of functional connectivity alterations that it produces.

Objectives: Psilocybin was used as a pharmacological probe of the serotonin system to directly establish whether the serotonergic targets of psilocybin function differently in autism. Specifically, the subjective effects and shifts in within- and between-network functional connectivity in response to psilocybin were investigated.

Methods: In our 'PSILAUT' experimental medicine study, non-autistic (n = 30) and autistic (n = 37) adult participants received either (inactive) placebo, 2 mg or 5 mg psilocybin on three separate visits in repeated-measures, double-blind, randomised order. A resting-state functional MRI scan was acquired at peak drug effects (~ 70 mins post-administration) and the 5-dimensional altered states of consciousness (5D-ASC) questionnaire was used to quantify self-reported subjective effects at the end of each visit (~ 4 hours post-administration).

Results: The results of these ongoing analyses will be reported here for the first time.

Conclusions: This work will have important clinical ramifications. Recent psilocybin clinical trials have reported efficacy across a range of psychiatric conditions, including depression – which is more common in autism. Hence, cohorts in psilocybin clinical trials will likely include autistic individuals. Our previous work has suggested that, for example, the functional connectivity of resting-state networks respond differently to drug challenge in autistic compared to non-autistic participants. Should this be replicated here, any potential differences in responsivity to psilocybin in autistic individuals specifically may influence clinical efficacy in this sub-population. Findings from this study may also inform sub-grouping of autistic participants based on individual responsivity to psilocybin.

436.047 The Role of Memory in Reading Intervention Success for Autistic Children

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Background: A subset of autistic children excel at word reading (i.e., decoding) but struggle with reading comprehension, resulting in a *discrepant poor comprehender* reading profile (Nation et al., 2006; Davidson, 2021). Reading comprehension requires visual and verbal memory processes to create a cohesive representation of the text (Wooley, 2010; Cain, 2006). Weaknesses in short-term memory processes have been reported in many autistic individuals (Williams et al., 2006). Verbal and visual short-term memory have also been associated with the development of other cognitive abilities in autistic populations, including expressive vocabulary and syntactic production (i.e., sentence recall; Talli, 2020). As such, short-term memory processes likely contribute significantly to reading comprehension. However, the role of memory in general and working memory specifically, on reading comprehension, and the same in the context of response to intervention, have not been examined in autistic children with the *discrepant poor comprehender* profile.

Objectives: The current study examines relationships between working memory, short-term memory, and reading comprehension in autistic children with a discrepant reading profile. We also examine whether these memory variables predict autistic children's reading comprehension after they complete a reading intervention.

Methods: 26 autistic children (females=7) have participated in this ongoing study (M age=11.29, SD =1.69). Participants completed testing sessions before (T1) and after (T2) participating in a 10-week reading intervention based on visual imagery (Visualizing and Verbalizing (V/V) intervention; Bell, 1991). A full-scale IQ (FSIQ) and verbal IQ (VIQ) of 70 or above, as measured by the Weschler Abbreviated Intelligence Scale (WASI-II), was required to participate (FSIQ M =90.77, SD =12.31; VIQ M =86.92, SD =10.36). Participants also completed The Gray Oral Reading Test (GORT-5) and The Wide Range Assessment of Memory and Learning (WRAML-2). Visual and verbal memory indices of the WRAML-2 were combined into the *memory screening index*, which represents general short term memory functioning. The Behavior Rating Inventory of Executive Function (BRIEF-2) was used to obtain parent-reported estimates of participants' working memory.

After running Pearson correlations, BRIEF-2 working memory (T-scores) and WRAML-2 memory screening index (standard scores) were submitted to a multiple linear regression with T2 GORT-5 comprehension (scaled scores) as the dependent variable. T1 GORT-5 scores were also entered as a predictor in this model to control for baseline comprehension. It was hypothesized that better general short-term memory and working memory would predict higher T2 comprehension scores.

Results: WRAML-2 screening memory was significantly correlated with T2 GORT-5 scores ($r(19)=0.607$, $p=.004$), while working memory was not ($r(20)=-.202$, $p=.367$). After controlling for baseline reading comprehension, WRAML-2 screening memory significantly predicted T2 GORT-5 scores ($\beta=.049$, $t(20)=2.33$, $p=.032$), while working memory did not.

Conclusions: These preliminary results suggest that short-term memory plays a significant role in autistic children's ability to improve their reading comprehension after intervention. Children with poorer short-term memory may have greater difficulty creating gestalt mental images of large text to facilitate reading comprehension, which is the general mechanism of this intervention. These children may benefit from additional supports or strategies.



436.048 The Vocational and Educational Index: A Comprehensive Update to the Vocational Index

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Background: The Vocational Index (VI) was developed in 2012 as a reliable method of categorizing vocational and educational activities of autistic adults (Taylor & Seltzer, 2012). Prior autism research often grouped activities into broad indicators of working or not working. The VI allowed for more nuanced coding that captured a range of vocational and educational experiences of autistic individuals. The VI has been well-used, but changes in postsecondary education (PSE) options and shifts in the employment landscape have created a need for an updated version (Sahin et al., 2020).

Objectives: This study outlines the process and outcomes of updating the VI into the Vocational and Educational Index (VEI), expanding the original framework to reflect the growing range of vocational and educational opportunities for autistic adults.

Methods: Updating the VI was an iterative process starting with reviewing over 200 interviews from a longitudinal study of autistic adults administered between 2020-2022. The research team identified activities not represented in the VI, and drafted code revisions to incorporate these activities. Through independent coding, two researchers applied new codes to the dataset, making minor adjustments to clarify and confirm accurate categorization.

Revised codes were applied to a sample of 384 autistic adults ages 18-35, drawn from four studies. Data was extracted from interviews/surveys then two researchers independently coded vocational and PSE activities using original and updated codes. Through consensus resolution, data review, and group discussions, the team ensured reliability and compared the two coding schemes for consistency and change.

Results: The most substantial change involved separating educational and vocational codes into parallel dimensions with activities benchmarked by community integration, supports, and number of hours. This allowed for more precise classification of PSE programs available to autistic adults. Other revisions clarified types of support and separated unpaid internships from volunteering.

The VEI introduced a summary code derived by taking the higher of the educational and vocational code. Compared to the original codes, the VEI dimensional codes provided insight into how vocational versus PSE activities contribute to overall summary codes. While just over 20% of adults had no vocational nor educational activities, the “no activity” codes were more frequent within each dimension with one-third of adults not participating in vocational activities, and about 70% of adults not in PSE programs.

Distributions of VI and summary VEI codes were similar (See Table). Nearly 50% of adults classified as a “9” in competitive employment or degree-seeking PSE programs, and around 25% in low-activity categories of “2” or “1”, indicating volunteering, non-degree/non-certificate seeking PSE programs, or no participation. A notable difference was the reduction in code “2” from 5.7% to 3.6%, due to reclassifications of unpaid internships and certificate programs into categories with higher scores.

Conclusions: The VEI offers a flexible framework for studying contemporary vocational and educational experiences of autistic adults, ensuring research can keep pace with evolving opportunities available to this population. Reliable coding categories will aid in tracking change in vocational/educational activities over time, examining outcomes of intervention, and comparing activities across cohorts and nationalities.

**436.049** Identifying Links between Parkinsonism Symptoms, Restricted and Repetitive Behaviors and Interests, and Caudate Volume in Autistic Adults across the Lifespan

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Background:

Autism spectrum disorder (ASD) is a complex neurodevelopmental condition primarily studied in children and young adults, leaving a significant gap in understanding its impact on aging autistic adults. Motor challenges are often overlooked in autism, and potentially contribute to elevated risk of parkinsonism, which has been demonstrated through healthcare records, the Unified Parkinson's Disease Rating Scale, and case reports. Our research group has shown elevated self-reported parkinsonism features in two independent cohorts, with one cohort showing cross-sectional evidence of accelerated volume loss in the caudate, a critical motor control brain region. Interestingly, caudate size has also been linked to restricted and repetitive behaviors and interests (RRBIs), a core feature of autism, but whether or not RRBIs are linked with parkinsonism in autistic adults has not been investigated. Elucidating behavioral risk factors that can help clinicians identify autistic adults that are more vulnerable to parkinsonism will be critical to providing the earliest and best care.

Objectives:

We aimed to investigate the relationship between self-report parkinsonism and RRBIs in two independent cohort, one from Arizona and a nation-wide sample recruited from Simons Powering Autism Research (SPARK). Relationships with caudate volume were also investigated in the Arizona cohort.

Methods:

The Parkinsonism Screening Questionnaire (PSQ) and the Adult Repetitive Behaviors Questionnaire-2 (RBQ-2A) were administered in both cohorts (Arizona $n=207$; SPARK $n=210$; see Figure 1 for full demographics). For the Arizona cohort, bilateral caudate volumes were calculated using FreeSurfer from T1-weighted MRI.

Results:

See figure 1 for graphical depictions and full statistical results. Correlations revealed that the RBQ-2A factor 1 – motor/sensory, factor 2 – rigidity/routines/restricted interests, and total score significantly correlated with the PSQ total score in both samples, showing moderate to small effect sizes (e.g. $r(38)=0.44$, $p=0.004$; $r(208)=0.34$, $p<0.001$ for RBQ-2A total in Arizona and SPARK, respectively). No significant correlations were found between left and right caudate volumes and RBQ-2A factor 1, factor 2, or total score, however, due to the explicit role of caudate in motor function, correlations were explored with a specific motor subscale of the RBQ-2A, which was significant bilaterally (e.g. Left: $r(83)=0.28$; $p=0.01$). No significant correlations between bilateral caudate volume and PSQ total scores.

Conclusions:

Our findings provide evidence that self-reported parkinsonism features are associated with RRBIs in autistic adults across two independent cohorts. Both factors and total scores from the RBQ-2A correlated with parkinsonism features, suggesting that RRBIs broadly contribute to parkinsonism risk in the autistic population, as opposed to repetitive motor behaviors alone. Importantly, there is no overlap in items assessed on the RBQ-2A and PSQ, suggest that this relationship is not a phenocopy or symptomatic overshadowing, but further investigation is needed to fully understand the association. In the Arizona cohort, repetitive motor behaviors correlated with caudate volume, but not parkinsonism features. This suggests that the potential risk that RRBIs may present for developing parkinsonism features in autistic adults is not mediated through the caudate. Future research is warranted to identify converging and diverging neural mechanisms of these two symptom domains in aging autistic adults.



436.050 Towards a Better Understanding of Adverse Life Experiences in Autism and Attention-Deficit Hyperactivity Disorder

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Background:

Adverse life experiences (e.g., poverty and abuse) are associated with negative life outcomes, such as depression and heart disease. This association follows a dose-response effect whereby the more adversities a person has experienced, the higher the likelihood of these negative outcomes. Research suggests that autistic/ADHD individuals are over twice as likely to experience adversity compared to neurotypical people, however, little is known about the intricacies of this relationship. Additionally, while research primarily focuses on negative outcomes, the hidden talents model theorises that adaptive strengths may also arise from adversity. This study aims to fill these gaps within research into adversity in autism and ADHD by investigating: (1) whether there are adversities specific to autism/ADHD, (2) why autistic/ADHD individuals may be more susceptible to adversities, and (3) whether these adverse experiences contribute towards adaptive strengths, following the hidden talents model.

Objectives:

Leveraging a large sample, diverse in sociodemographic characteristics, we conducted a qualitative investigation into adverse experiences and life outcomes in adults with ADHD and/or autism, to gain novel insights into adversity and adaptive strengths in neurodevelopmental conditions.

Methods:

One hundred and twenty-three individuals aged 18 years and over, living in the UK or USA, who were diagnosed or self-identified as autistic or with ADHD, were sampled via online platforms. Participants completed an online survey with three open-ended questions, reporting their adverse experiences, the role of their neurodevelopmental condition on these experiences, and any resulting strengths. Data were analysed in NVivo, using inductive thematic analysis.

Results:

The findings, shown in Figure 1, suggest that cognitive (e.g., disorganisation), social (e.g., difficulties maintaining social relationships), emotional (e.g., emotional dysregulation), and environmental (e.g., lack of accessible support) factors play a role in participants experiencing marginalisation (i.e., job insecurity, financial instability, and neglect) and mistreatment (i.e., bullying, abuse, and isolation). In total, 63% of participants reported experiencing mental and physical health decline as a result of these adverse experiences. Notably, 75% participants also reported adaptive strengths derived from these adverse experiences, with approximately 25% identifying that they were more empathetic and 23% identifying that they were more resilient. However, 22% of participants highlighted that they did not develop any strengths as a result of their adversities.

Conclusions:

The direct accounts obtained from autistic and ADHD adults highlight several cognitive, social, emotional, and environmental factors that may increase the risk of adverse experiences in neurodivergent populations. Our findings have the potential to inform support given to these individuals across a range of settings (e.g., school, home, workplace). Crucially, this is the first study to apply the hidden talents model to autism and ADHD, showing that adversity may lead to some adaptive strengths such as empathy and resilience. However, further empirical research is required to elucidate the extent of these adaptive strengths.



436.051 Training Community Clinicians in Tennessee to Provide Quality Care for Autistic Adults

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Background:

Autistic adults experience significant unmet healthcare needs, with opportunities for improvement in both the systems and the practitioners who serve this population. Novel models to provide training and support to practitioners are sorely needed.

Objectives:

This project developed and is currently testing an Extension for Community Healthcare Outcomes (ECHO) care model adapted from our previous work. It was specifically focused on training practitioners in Tennessee who care for autistic adults, and those with other neurodiverse conditions, in best-practice medical and behavioral care. A key aspect of the program was the inclusion of an autistic adult and also family advocates.

Methods:

Community healthcare practitioners (physicians, nurse practitioners, licensed clinical social workers) who accept Tennessee Medicaid insurance are part of the ECHO program, which meets virtually on the Zoom platform. One six-month cohort (meeting twice a month for an hour) ended in March 2024 and a second cohort is running from June – November 2024. An expert team guides these practitioners, and includes an autistic adult, two neurologists, a psychiatrist, an internal medicine physician, a psychologist, and several family advocates. The community practitioners present deidentified cases for discussion by the entire team. The expert team presents brief didactic sessions that include topics such as managing medical and psychiatric conditions, supporting the autistic adult, self-determination and life skill development, government, housing and community supports, enabling technology including assisted communication devices, and cultural competency.

Results:

Participants completed demographics surveys at baseline (pre-training) along with goals that they wanted to improve on based on the ECHO training. After the ECHO session, they rated their progress. The majority reported good to excellent progress in attaining their goals, which included “becoming more competent in treating individuals with IDD and to recognize common issues they face when obtaining healthcare,” and “to identify resources for patients and families to optimize their treatment outcomes.” Additional feedback included: “(before the ECHO) I felt like I was by myself trying to figure it all out. My nurse practitioner school did not provide IDD education,” and “I feel more confident in being able to provide the resources necessary for patients and their families to live the fullest life possible.” Throughout the ECHO, individuals with life experiences related to autism contributed their stories and perspectives.

Evaluation of self-efficacy measures and claims data one-year before and after ECHO sessions (number of ED visits, hospital bed days, PCP visits per member, collection of lipids and hemoglobin A1C) are ongoing.

Conclusions:

Interactive models focused on training community healthcare practitioners, with the involvement of an autistic adult and family advocates, are effective in empowering practitioners to work with autistic adults.

436.052 Traumatic Life Experiences and PTSD Symptoms in Middle-Aged and Older Autistic Adults

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Background: High rates of traumatic life experiences and symptoms of poor mental health (including PTSD symptoms) are often reported by autistic people (Quinton et al., 2024), including by middle-aged and older people with high autistic traits (Stewart et al., 2021). However, these experiences and problems have yet to be studied in diagnosed autistic populations in midlife and older age.

Objectives: This pre-registered study (<https://osf.io/tnye7>) explored the differences in the frequency and types of traumatic experience and symptoms of post-traumatic stress among autistic and non-autistic adults in midlife and older age.

Methods: This study used data from the second wave of the AgeWellAutism project (collected in 2023), a sample of 469 autistic and 183 non-autistic adults aged 40 to 90 years old (mean = ~60 years; ~55% female). Participants completed widely used and standardised measures of trauma/adversity in childhood and adulthood (Grabe et al., 2012; Khalifeh et al., 2015), and of mental health, including PTSD symptoms (Lang et al., 2012), depression (Kroenke et al., 2001), and anxiety (Spitzer et al., 2006).

Results: The autistic group, particularly autistic women, reported significantly higher rates of self-reported traumatic events in both childhood and adulthood, including emotional and physical abuse/neglect and sexual abuse [ORs=2–6]. The autistic group reported more symptoms of PTSD than the non-autistic comparison group [$F(1,625)=144.10, p<.001$]. Severity of PTSD symptoms was positively correlated with the experience of trauma in childhood [$r=.346$ vs. $r=.199$] and adulthood [$r=.426$ vs. $r=.192$] in both autistic and non-autistic groups, respectively. These associations were significantly stronger in the autistic group than the non-autistic group (trauma in childhood $z=1.81, p=.035$; adulthood $z=2.97, p<.001$). This pattern of group differences and associations persisted when accounting for symptoms of depression and anxiety.

Conclusions: The findings from the current study align with similar findings from middle-aged and older populations with high autistic traits. Middle-aged and older autistic people, particularly autistic women, were found to be at a higher likelihood of reporting trauma from childhood and in adulthood, and experiencing high rates of current symptoms of PTSD when compared to non-autistic comparisons. A stronger association between trauma exposure and PTSD symptoms was found in the autistic participants compared to the non-autistic group. Taken together, these findings suggest that autistic people may be particularly susceptible to trauma and PTSD symptoms in midlife and older age. These findings highlight the importance of understanding autistic people's past experiences and ensuring they have access to trauma-informed help and support.

436.053 Autism Services and Support Implemented in a Sensible Timeframe (ASSIST) Michigan Families Study

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Background:

Diagnosing and receiving treatment for Autism Spectrum Disorder (ASD) can be lengthy and costly for families. The Autism Services and Support Implemented in a Sensible Timeframe (ASSIST) Michigan Families study aims to understand families' experiences with ASD diagnosis, evaluation, and receipt of treatment services in the State of Michigan.

Objectives:

In partnership with the Michigan Chapter of the American Academy of Pediatrics (MIAAP) and the Autism Alliance of Michigan (AAOM), our team hopes to learn more about barriers to children receiving care for ASD and any inequities related to the timely receipt of services.

Methods:

Caregivers, ASD evaluators, and pediatric providers were invited to participate in surveys and follow-up interviews. Eligibility criteria for surveys and interviews were as follows: the participant lives in Michigan, and either has a child aged 0-6 years old receiving ASD services (caregivers) or provides autism-related services (autism evaluators and pediatric providers). Participants were recruited through AAOM (caregivers) and MIAAP (pediatric providers) membership email lists. ASD evaluators were recruited directly from evaluation centers in Michigan.

Surveys were developed in partnership with MIAAP and AAOM and included questions about diagnosis experiences and receipt of services, focusing on the time elapsed from initial diagnosis to treatment. After completing the survey, participants indicated whether they were interested in a follow-up interview. Interviews were conducted via Zoom and averaged about 30 minutes. The semi-structured interview script covered topics similar to the survey, allowing interviewees to tell their stories in detail. After completing the interview, participants received a \$25 gift card.

Results:

To date, 87 families have completed the survey, and 27 have completed an interview (data collection will be completed by November 2024). Initial analyses of survey data indicate that the average wait time for families to receive a formal ASD assessment after initial screening is about one to three months. Caregivers' interview responses described longer wait times, with many families waiting up to a year for a formal ASD assessment. Families indicated that insurance was a significant barrier to assessment and treatment. To date, 12 ASD evaluators have completed the survey, and 7 have completed interviews. Evaluators also indicated that insurance could be a significant barrier for families, especially if families are out of network and must pay for the evaluation out of pocket (estimated to cost \$1,500-\$3,000) (Cross River Therapy). To date, 44 pediatric providers have completed the survey, and 4 have completed interviews. Providers indicated that finding an evaluation center and treatment services promptly are significant barriers to their pediatric patients receiving treatment for ASD.

Conclusions:

Insurance status and wait times posed barriers to families needing ASD diagnosis and treatment. More research is needed on how insurance plans cover ASD, what steps families must take to receive a formal evaluation, and how to educate families on ASD management. Results from this study will be shared with partners and family-facing educational materials will be created in an effort to support families seeking ASD services in Michigan.

436.054 Understanding Provider Experiences and Needs with Treating Sleep Disorders in Autistic Adults Study

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Background:

Insomnia is a significant issue among autistic adults. Insomnia is associated with increased risks of cardiovascular disease, diabetes, psychiatric conditions, and mortality — autistic adults have higher risks for all these conditions. Despite the prevalence of sleep problems in this population, there is a lack of research focused on cognitive behavioral therapy for insomnia (CBT-i), an effective evidence-based treatment. Many providers in other fields report a lack of training and experience to treat this group effectively. This study explores the experiences and perceptions of sleep providers treating insomnia in autistic adults.

Objectives:

The study is to

- Examine whether sleep providers trained in CBT-i receive referrals to treat autistic adults with insomnia.
- Assess providers' perceived motivation and competence, including their training, experience, and confidence in treating this population.
- Identify barriers and facilitators impacting providers' ability to treat this population effectively.

Methods:

We recruited sleep providers certified in CBT-i or practicing behavioral sleep medicine to participate in a national online survey. Providers were recruited through professional listservs, including the Behavioral Sleep Medicine Group and CBT-i Networks. The research applied the Capacity, Opportunity, and Motivation for Behavior (COM-B) model, assessing sleep providers' self-reported experiences regarding referrals for autistic patients, previous treatment experiences, perceived competence, and motivation. Demographic information (age, gender, race/ethnicity, professional background) was also collected. Correlation analyses were performed to investigate relationships between sleep providers' intention to treat autistic adults and factors such as training, confidence, and experience.

Results:

Eighty-four verified sleep providers were included in the analysis. The average age of respondents was 43.64 years, with 21 men and 62 women. 71.4% of sleep providers have no experience treating autistic adults. Sleep providers reported inadequate training (66.7%), skills (61.9%), and resources (64.3%) to treat this population effectively. Sleep providers who treated autistic adults reported many concerns including therapy compliance, motivation, and provider-patient communication. Most providers (77.4%) reported that they received no referrals for autistic adults with insomnia. Among those who had treated autistic patients, only 0.9% of their caseload consisted of autistic adults. Nonetheless, 63.1% of sleep providers expressed a willingness to treat autistic adults in the future, and 76.2% of providers expressed at least moderate confidence that CBT-i could treat insomnia in autistic adults. Correlation analyses showed strong links between sleep providers' intention to treat autistic adults and their training ($r=.47, p<.001$), skills ($r=.52, p<.001$), resources ($r=.41, p<.001$), confidence ($r=.42, p<.01$), referrals ($r=.38, p<.001$), and experience in treating this population with insomnia ($r=.36, p<.001$) or in general ($r=.53, p<.001$).

Conclusions:

This study highlights substantial barriers to treating insomnia in autistic adults, particularly regarding referrals and sleep providers' preparedness. While many providers show willingness to treat this population, providers report that gaps in training and resources hinder their ability to provide effective care. These findings underscore the need for improved training and support for trained CBT-i sleep providers to enhance care access and quality for autistic adults with sleep disorders. Future research should focus on developing tailored interventions and resources to better equip sleep providers in treating this underserved population.

436.055 Understanding the Autism Phenotype Among Individuals with Hnrnp-Related Neurodevelopmental Disorders

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Background: The HNRNP-Related Neurodevelopmental Disorders (HNRNP-RNDDs) are a group of NDDs caused by damaging variants in the heterogeneous nuclear ribonucleoprotein (hnRNP) family. To date, several HNRNP-RNDDs have been described and multiple candidate HNRNP-RNDDs are being investigated. It has been observed that the HNRNP-RNDDs have an overlapping clinical spectrum, which includes autism spectrum disorder (ASD). Overall, about half in individuals with HNRNP-RNDDs have a diagnosis of ASD or autistic features.

Objectives: To better understand the autistic features among individuals with HNRNP-RNDDs.

Methods: Here, we utilize ongoing RNA-seq data in induced neurons from fibroblasts from individuals with HNRNP-RNDD, publicly available RNA-seq data, and the literature to better understand the contribution of variants in *HNRNP* genes to autism spectrum disorder and other behavioral differences. We also evaluate candidate genes to understand the molecular overlap they may share with ASD-associated *HNRNP* genes. Finally, we have queried available phenotypic data from studies such as SPARK and Simon's Searchlight focused on ASD to better understand the behavioral features of each HNRNP-RNDD.

Results: The prevalence of ASD varies by disorder, with the least frequently diagnosed being those with HNRNPC-RNDD (18%) and the most frequently diagnosed being those with HNRNPUL2-RNDD (83%). We are assessing the RNA-seq data to better understand the molecular mechanism(s) of HNRNP-RNDDs.

Conclusions: The HNRNP-RNDDs are an example of a family of molecularly related disorders. By gaining an understanding of the clinical and molecular features of each disorder, we can work towards development of shared therapeutics.

436.056 Understanding the Goals of Adults with Autism: Implications for Service Design and Support

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Background:

Approximately 1 in 45 adults in the United States are diagnosed with autism spectrum disorder (ASD) (Dietz et al., 2020), with an estimated 50,000 adolescents transitioning to adulthood annually (White et al., 2021). These individuals often experience poorer quality of life outcomes compared to their peers (Mansell & Beadle-Brown, 2012). Goal setting is a critical factor in improving outcomes across various domains for individuals with ASD (White et al., 2018). Understanding the goals they prioritize in adolescence and adulthood is crucial for designing services that support autonomy, skill development, and quality of life. This research poster leverages data from a center for adults 18+ with autism spectrum disorder (ASD) and other neurodevelopmental disabilities. The center offers a wide array of classes and outings tailored to the diverse interests and support needs of its participants.

Objectives:

This research analyzed qualitative data from participants who self-identified as having ASD collected during intake at an adult life center over the past decade. It aims to understand the goals these individuals prioritize as they engage in lifelong learning and community activities. This research provides insights into the specific service needs and goals of adults with ASD.

Methods:

This poster presents the stated goals of 284 adults at the time they enrolled in an adult life center between 2014 and September 2024. During the intake process, participants, their caregivers, or support staff completed a form providing demographic information and responding to an open-ended question about their current goals. These responses were qualitatively coded to identify recurring themes.

Results:

284 adults with self-identified ASD participated at the Center between 2014 and 2024. 66% of the sample were male, 31% were female, 2% identified as nonbinary, and 1% chose not to disclose their gender. The ages of individuals in the sample are between 17 and 52 years old, with a mean age of 23 years at the time of intake. The interquartile range (IQR) was between 19 and 25, with about half of the sample falling between those ages. The sample was 64% White, 13.4% Asian, 3.2% Black or African American, 2.1% Hispanic or Latino Origin, 0.4% Native Hawaiian or Other Pacific Islander, 2.1% Other, 7.4% were two or more races, and 7.4% declined to provide their race.

Ten goal themes were identified for the sample: social connection, skill acquisition, hobbies and activities, independence, vocation, education and learning, physical health, wellbeing, routine and structure, as well as those who stated they did not currently have any goals they were working towards.

Conclusions:

Understanding the desires and goals of adults with ASD have for themselves in both the short and long term can inform the types of services and supports that should be provided for adults with autism spectrum disorder. These goals highlight what kinds of engagement adults want out of their communities to foster their growth.



436.057 Unraveling the Path from Autism Acceptance to Quality of Life in Autistic Transition-Age Youths: A Parallel Mediation Model

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Background: Autistic young adults experienced unique psychosocial challenges in transitioning to postsecondary settings. These challenges may result from both the nature of autism and the developmental tasks associated with this unique developmental stage. Given the challenges and barriers faced by this population, understanding the relationship among factors impacting QOL in this transition period and developing relevant interventions is crucial. According to Beatrice Wright's "coping vs. succumbing" framework, individuals who accept their disability as non-devaluing and are oriented to what they can do are often described as coping, which is associated with improved QOL. The critical role of acceptance and coping in enhancing QOL during the psychosocial adaptation process has been well-recognized in studies on various types of disabilities. However, the intricate interplay between these factors and their collective influence on QOL remains unclear.

Objectives: The purpose of the study was to investigate the role of autism acceptance, which represents autistic individuals' internal perceptions and understanding of the external environment and self, in the psychosocial adaptation process. Also, the study aimed to elucidate the relationship between autism acceptance, coping, and QOL based on Wright's "coping vs. succumbing" framework. It was hypothesized that (a) both autism acceptance (i.e., perceived and self-acceptance) and coping (i.e., engagement and disengagement coping) significantly predict levels of QOL and (b) coping serve as a partial mediator in the relationship between autism acceptance and QOL. This investigation intended to provide practical implications that can inform the development of effective transition interventions.

Methods: 204 autistic young adults aged 18 to 26 recruited from Prolific and Amazon Mechanical Turk (MTurk) completed an online survey consisting of instruments measuring target variables. Two parallel mediation models were examined to explore the relationships between autism acceptance, coping, and QOL.

Results: Both parallel mediation models showed good fit. In the first model, perceived acceptance had a significant direct effect on QOL ($\beta = .512$, $p < .01$) and a significant indirect effect through engagement coping ($\beta = .059$, $p < .01$). In the second model, the effects of self-acceptance on QOL were fully mediated by both engagement ($\beta = .073$, $p < .01$) and disengagement coping ($\beta = .089$, $p < .01$).

Conclusions: Autism acceptance is a crucial psychosocial factor in impacting successful transition to postsecondary settings. Acceptance-based transition services should be developed for autistic young adults to help them gain a comprehensive understanding of their relationship with self, others, and their autism. Findings in this study emphasized the necessity to incorporate the concept of acceptance into transition services that can prepare autistic youths with necessary strategies to cope with adverse societal attitudes and develop positive self-images when entering postsecondary settings. Both perceived and self-acceptance should be integral components of the techniques and activities used in these services. Provision of relevant trainings and interventions is essential to assist practitioners in ameliorating any derogatory understanding of autism. Practitioners should learn to echo the neurodiversity movement and advocate with this population for their deserved rights.

436.058 Unseen Disability: Autism and Severe Menstrual Pain

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Background: Autistic women are underserved in research and clinical practice. There is increasing evidence of women's health concerns at all stages of life among autistic women, and debilitating impairment related to reproductive health-related pain. However, there are few reports of menstruation-related pain among autistic women.

Objectives: The present report of original research aims to describe experiences of menstrual pain reported by autistic natal females (assigned a sex of female at birth), and the impact of menstrual pain on work and wellbeing.

Methods: The study sample was drawn from a larger study of reproductive health among autistic natal females who were recruited through SPARK Research Match in 2023. Participants in the present study (N=335) ranged in age from 19 to 74 (M=36.45, SD=11.06), who were still or no longer menstruating. 28.60% had a bachelor's degree or higher and 86% were Caucasian. The present study reports on responses to the following open-ended survey (Qualtrics) questions: "describe the location and intensity of the pain that you experienced with your period," "have you ever had to take time off of work due to menstruation or menstruation-related experiences?", "was the impact of menstruation on your well-being so significant that you needed medical intervention?". Numeric responses were tabulated (presence and frequency of menstrual pain), open-ended responses were reviewed, topics (initial codes) were identified, and themes bridging two or more topics were created by the PI and two undergraduate research assistants.

Results: Of the N=335 participants, N=223 (66.56%) were currently menstruating. Of those currently menstruating, 35.52% (N=119) always and 24.48% (N=82) sometimes experienced pain with menstruation. The locations and intensities of menstrual pain are reported in Table 1. Pain was reported throughout the body and ranged in severity from severe ("My cramping feels like someone is trying to sever my body in half") to mild ("Tenderness"). 43.58% (N=146) of participants reported needing to take time off work (at least once a month to the occasional day; see Table 2) due to menstrual pain. Among participants who did not take off work, some wished to take time off, but feared losing their jobs and would instead "power through" the pain. N=81 (36.3%) of menstruating and N=65 (58%) of not menstruating participants reported requiring medical intervention due to intense menstrual pain. Severity of medical intervention ranged from over-the-counter medications to invasive surgery (e.g. N=20 hysterectomies) to reduce the pain. Participants described being sent home from medical appointments with no answers about their menstrual pain, causing major strain on mental health and relationships. Menstrual pain caused a struggle to understand "what's wrong with them."

Conclusions:

Participants in the present study described intense menstrual pain that significantly impacted their ability to work, often requiring medical intervention. Barriers to health care were noted, including dismissal from health professionals who did not understand or doubted the degree of pain. Greater understanding of menstrual pain and its impact on body systems (e.g. cognition) and daily life (e.g. work, relationships) is necessary. Additionally, investigation of effective and targeted treatments for menstrual pain are needed.



436.059 Using Epigenetic Clocks to Examine Biological Aging in Autistic Adults

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Background: Autism is a lifelong condition, and in line with general aging trends, the number of older autistic individuals will increase in the coming years. This demographic shift highlights the urgent need to enhance our understanding of aging processes in the context of autism, including identifying risk and resilience factors to promote optimal aging outcomes. Epigenetic clocks offer a valuable tool for gaining insights into biological aging processes well before observable behavioral signs of aging emerge. These clocks estimate an individual's biological age by measuring age-related changes in DNA methylation at specific CpG sites. By comparing an individual's biological age to their chronological age, we can determine whether they are aging faster or slower than expected. This knowledge provides an opportunity to explore the factors that may influence the pace of aging, potentially guiding interventions to optimize aging trajectories.

Objectives: This study examines epigenetic aging in autistic adults followed since diagnosis at age two, providing a valuable chance to explore biological aging in a well-characterized sample. We sought to 1) compare epigenetic aging measures between autistic and neurotypical adults, and 2) identify factors predicting variations in epigenetic aging among autistic adults.

Methods: Oragene kits were used to collect saliva samples from 43 autistic adults (Mean Age: 29.77, 28-33 years; Mean NVIQ =71; 5-133) as part of an ongoing longitudinal study. DNA was extracted according to the manufacturer's protocol and underwent methylation analysis using the Illumina Infinium MethylationEPIC BeadChip. Matched control data were sourced from the Gene Expression Omnibus database, focusing on age-matched neurotypical individuals with saliva-derived methylation data (Mean age: 30.63, Range: 28-33). Methylation data from all participants were uploaded to the Epigenetic Clock Calculator (<https://dnamage.genetics.ucla.edu>) to estimate biological age using first- (Horvath, Hannum) and second-generation (PhenoAge, GrimAge) clocks. Epigenetic age acceleration (EAA) was quantified by regressing age estimates against chronological age, with residuals indicating acceleration (positive) or deceleration (negative).

Results: Independent samples t-tests indicated no significant group-level differences in EAA estimates using any of the four clocks (Figure 1). Although group-level differences were absent, substantial variability exists in EAA estimates among autistic adults (Figure 2). This underscores the necessity of recognizing individual variations within this population, beyond merely considering group-level distinctions. We will present findings from ongoing analyses examining how specific sociodemographic, lifestyle, and clinical factors, such as education, health conditions, and social engagement, predict EAA variations.

Conclusions: Our analysis revealed no significant group-level EAA differences between autistic and neurotypical adults. However, this underscores the need to focus on individual aging processes within the autistic population, rather than assuming uniform patterns of accelerated or slowed aging. Importantly, our findings show that epigenetic clocks can be successfully applied to study aging in a diverse sample of autistic adults, encompassing a wide range of cognitive, language, and functional abilities. This approach offers a powerful tool for understanding who may be at greater risk of accelerated aging and who demonstrates more resilient aging processes. By identifying these key risk and resilience factors, we can develop strategies to better support aging autistic adults.



436.060 Using Wearable Devices and Machine Learning Model to Predict Depressive Symptoms in Autistic People

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Background: Autism spectrum disorder (ASD) is frequently co-occurred with mood disorders, that may impact quality of life of the individuals in the adulthood. Proper assessment of mood symptoms will be important in terms of clinical care in autistic adults. However, identifying and monitoring depressive symptoms in autistic individuals present a significant challenge, primarily due to communication deficits and difficulties in emotional regulation inherent to this population.

Objectives: This study aims to develop predictive models for mood symptom monitoring in ASD individuals using digital biomarkers from wearable devices and machine learning algorithms.

Methods: Seventeen autistic adults were recruited from the Department of Psychiatry at National Taiwan University Hospital, Taipei, Taiwan. Utilizing Garmin Vivosmart 4 devices and weekly mental health questionnaires for depressive symptoms and sleep problems, as well as physical biomarkers including sleep, activity levels, and heart rate features were collected. Machine learning models, including the Logistic Regression, the Decision Tree, the KNN, the Random Forest, the AdaBoost, and the XGBoost were employed. We used the method of 5-fold cross-validation was employed for assessing the performance and generalizability of machine learning models.

Results: The preliminary analysis revealed that the XGBoost model demonstrated superior predictive efficacy, accurately identifying mild depressive states with an 84% accuracy and an AUROC of 0.91. Using SHAP for explainable AI, among all features of sleep, activity, and heart rate, lower activity levels, decreased sleep duration, and a reduced average heart rate emerged as potential predictors for mild depressive states.

Conclusions: Despite limitations such as sample size and data collection methods, this study highlights the importance of early detection for depression in autistic adults. Wearable technology and machine learning approaches show promise for mood monitoring in ASD. Our findings warrant further exploration of additional physiological variables and validation of clinical significance.

436.061 Utility of the W-ADL to Assess Daily Living Skills in Minimally Verbal Autistic Adults

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Background: Approximately 30% of autistic individuals are minimally verbal (MV), but this subgroup is understudied and often excluded from research (Rose et al., 2016). Evaluating daily living skills (DLS), and adaptive functioning more broadly, is an essential part of characterizing autism research samples. Comprehensive measures of DLS, such as the Vineland Adaptive Behavior Scales (VABS-3; Sparrow et al., 2016), are cost- and time-intensive. The Waisman Activities of Daily Living (W-ADL; Maenner et al., 2013) is a 17-item caregiver-reported DLS questionnaire. Given its brevity and open-access availability, the W-ADL may present a more feasible alternative to assess DLS, particularly in research contexts where the time and cost of evaluating critical constructs such as DLS may limit or impede the collection of other information.

Objectives: In a sample of MV autistic adults, this study evaluated the psychometric properties of the W-ADL. Specifically, this study examined:

1. criterion validity by comparing W-ADL and VABS-3 scores across parent-reported expressive language levels
2. convergent validity by examining correlations between W-ADL and VABS-3 scores.

Methods: Participants included 156 caregivers of MV autistic adults who completed the W-ADL as part of a larger SPARK Research Match study (Table 1). One-way ANOVA was used to compare W-ADL total and VABS-3 DLS domain standard scores (SS) across parent-reported expressive language levels (*No words/does not speak*, *Use single words meaningfully*, *Combines 3 words together into short sentences*). Pearson correlations were conducted to compare W-ADL total scores and the VABS-3 Adaptive Behavior Composite (ABC), DLS domain SS, and DLS subdomain (personal, domestic, and community) raw scores.

Results: W-ADL total and VABS-3 DLS standard scores differed significantly as a function of expressive language level (Figure 1). Correlations with W-ADL total scores were all statistically significant ($p < 0.05$) and ranged from moderate to very strong ($r_{ABC} = 0.612$; $r_{DLS} = 0.731$; $r_{Personal} = 0.842$; $r_{Domestic} = 0.759$, $r_{Community} = 0.591$).

Conclusions: The present study supports the W-ADL's validity for capturing DLS variability within MV autistic adults. Correlations indicate strong associations between the W-ADL and VABS-3 DLS estimates. Furthermore, W-ADL and VABS-3 showed similar patterns of variability across expressive language subgroups, with individuals with single words or phrases demonstrating more DLS than those who were non-speaking. Comparison of effect sizes suggests the VABS may be more sensitive to detecting differences than W-ADL, particularly in relation to the phrase-speech group. Item-mapping across instruments is underway to better understand comparability of estimates.

Given the limited time for collecting information from families in research, lengthy measures like the VABS-3 can be time-intensive and burdensome for families to reiterate daily challenges. Hence, the W-ADL may offer a viable alternative for characterizing DLS, particularly when research teams wish to dedicate more time to understanding other needs and strengths of autistic individuals. Future research evaluating the validity of the W-ADL across the full range of verbal and cognitive abilities is needed to further understand its utility across diverse settings.



436.062 Validating a Non-Wearable Device (Withings Sleep Analyzer) in Measuring Sleep Behaviours in an Autistic Adult Population.

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Background: Autistic adults experience a higher incidence of sleep disturbances that influence well-being and quality of life compared to non-autistic peers. Addressing and improving sleep behaviours requires accurate monitoring and measurement for targeted intervention. However, existing device-derived measurements of sleep are typically obtrusive and incompatible with the sensory or routine preferences of autistic individuals. Thus, the exploration of alternative device-based measurements for sleep is warranted. The Withings Sleep Analyzer (WSA) is a non-wearable, nearable and commercially-available device that measures the sleep behaviours of people in their own environments. The WSA has not yet been validated in an autistic adult population.

Objectives: This study examined the concurrent validity of the WSA compared to the ActiGraph GT9X in measuring sleep behaviours among autistic adults.

Methods: A total of 28 autistic adults (18-64 years) were included in the study. Individuals used the WSA and wrist-worn ActiGraph GT9X within their typical, everyday environments for 10-consecutive days. Participants self-installed the WSA device under their home mattress and wore the ActiGraph GT9X on their non-dominant wrist during their primary sleep period. Total sleep time (TST), wake after sleep onset (WASO), sleep onset latency (SOL), sleep efficiency, and wake and sleep times were compared to determine the level of association between the devices. Bland-Altman plots were used to analyse the level of agreement between devices and intraclass correlation were used to assess internal reliability.

Results: The WSA consistently overestimated outputs for TST, WASO and SOL, compared to the Actigraph GT9X. There were moderate associations between devices in measuring WASO, sleep efficiency and wake times. There were poor associations between devices for TST and sleep time. There was a strong association between devices for predicting SOL. Overall, there was good compliance in the use and wear-time of both devices.

Conclusions: This study demonstrated that the WSA is a useful, objective method of attaining device-derived sleep data. The associations between the WSA and ActiGraph GT9X were not statistically significant and encompassed systematic bias for TST, SOL and WASO. Future research and interventions incorporating the WSA should be used with caution due to consistent overestimation of sleep behaviours compared to the ActiGraph GT9X. However, as an affordable, non-wearable and commercially-available device the WSA provides autistic adults a sensory-affirming option to measure and monitor sleep behaviours within their home environments

436.063 Sleep Quality and Mental Health in Middle-Aged and Older Autistic and Non-Autistic Adults.

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Background: Sleep is an important biological function, and impaired sleep can lead to a range of problems, including poor health and wellbeing. Many autistic children and adults have been found to have poor quality sleep and higher rates of sleep disorders and problems (Schreck & Richdale, 2020), as have middle-aged and older people with high autistic traits (Stewart et al., 2020). However, these experiences and problems have yet to be studied in diagnosed autistic populations in midlife and older age.

Objectives: This pre-registered study (osf.io/973z8) explored differences in sleep quality and mental health problems among middle-aged and older autistic adults compared with an age- and sex-matched non-autistic comparison group.

Methods: This study used data from the first wave of the AgeWellAutism project (collected in 2019), from a sample of 265 autistic and 167 non-autistic adults aged 40 to 93 years (mean = ~60 years; ~50% female). Participants completed widely used and standardised measures of sleep quality/problems (PSQI; Buysse et al., 1989) and of mental health, including depression (PHQ-9; Kroenke et al., 2001), anxiety (GAD-7; Spitzer et al., 2006), and PTSD symptoms (PCL-6; Lang et al., 2012).

Results: The autistic group reported significantly more difficulties with various aspects of sleep, including lower perceived sleep quality, longer sleep onset latency (i.e., how fast you fall asleep), shorter sleep duration, worse sleep efficiency, more sleep disturbances, higher rates of requiring medication to sleep, and having more daytime tiredness and dysfunction. Overall, the autistic group reported significantly worse sleep quality index scores than the non-autistic comparisons, including when controlling for age and symptoms of mental health. Additionally, sleep quality index scores were significantly associated with older age and poor mental health in both groups, with the association between sleep and anxiety being stronger in the autistic group.

Conclusions: The findings from the current study align with similar findings from middle-aged and older populations with high autistic traits. Middle-aged and older autistic people were found to be at a higher likelihood of experiencing a broad range of sleep problems and worse overall sleep quality index scores when compared to non-autistic comparisons. Sleep index scores were associated with older age and mental health problems, particularly anxiety. These findings, albeit cross-sectional and correlational, suggest causal connections should be explored through intervention. Treating and managing symptoms of poor mental health, particularly anxiety, may help with improving sleep quality in autistic populations, particularly as autistic people get older.

436.064 Personality Disorder Diagnoses in UK Autistic People: Evidence from a Matched Cohort Study

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Background: Clinical accounts and cohort studies suggest that autistic people are disproportionately likely to be diagnosed with a personality disorder, which potentially increases their chances of exclusion from services.

Objectives: We measured the incidence of personality disorder diagnoses in UK autistic people between 2000 and 2019 and report the prevalence of diagnosed personality disorder among autistic people relative to the general population.

Methods: We conducted a cohort study of adults drawn from the IQVIA Medical Research Database with a diagnosis of autism, with follow-up from Jan 1, 2000 to Jan 16, 2019. We included a comparison group without diagnosed autism, matched (1:10) by age, sex, and primary care practice. We compared incidence of personality disorder, stratifying results according to diagnosis of intellectual disability (ID).

Results: We included 22,112 autistic adults. 6,437 (29.1%) had a diagnosis of intellectual disability, the median age was 20.36 (IQR 18- 28.47), and 16,881 (76.3%) were men. Compared to the general population, the rate of personality disorder diagnosis in autistic people without ID was 4.8 (3.5 to 6.7) times higher for men and 4.6 (3.1 to 6.8) times higher for women. For autistic participants with ID, the rate was 2.0 (1.0 to 3.7) times higher for men and 8.3 (4.0 to 17.2) times higher for women. Estimated incidence of personality disorder diagnosis for autistic people aged 20 increased from 14.67 (95% CI 10.36-20.77) per 10,000 person-years in 2009 to 22.43 (95% CI 13.86-36.30) in 2019. Incidence of personality disorder diagnosis increased in women (including autistic and comparison women) but remained largely stable in men.

Conclusions: Personality disorder diagnoses were more common in autistic people, and more so in women. We argue that this perhaps suggests attribution of autism/associated mental health support needs to personality disorder. Other hypotheses are also considered.

436.065 Systematic Review and Meta-Analysis of Recorded PTSD Prevalence Rates in Diagnosed Autistic Populations

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Background: Autistic individuals are more likely to experience traumatic life events and increased mental health difficulties. Surprisingly, there have been no comprehensive reviews to examine the prevalence rates of post-traumatic stress disorder (PTSD) among diagnosed autistic individuals. It is hard to understand how this feeds into prevalence using current diagnostic criteria. For example, several reviews have indicated increased PTSD symptoms within autistic populations, particularly when using self-report measures.

Objectives: The aim of this review is to conduct a meta-analysis to understand the recorded prevalence rates of PTSD in diagnosed autistic child-adolescent, and adult populations, as well as the factors that may influence these rates.

Methods: A systematic literature search was conducted to identify relevant studies reporting current and lifetime PTSD prevalence rates in diagnosed autistic populations. After screening, a total of 15 child-adolescent (n = 53,329) and 10 adult (n = 5,902) studies were included in the meta-analysis. Subgroup analyses were performed to explore the influence of factors which have been found to influence PTSD prevalence rates in neurotypical populations.

Results: After removing outliers, the findings indicate that the current prevalence of PTSD among diagnosed autistic children and adolescents was 0.8% (95% CI = 0.16; 1.94, $t^2 = 0.0016$), with a lifetime prevalence of 2.91% (95% CI = 1.76; 4.33, $t^2 = 0.0012$). For autistic adults, the current prevalence was 1.96% (95% CI = 0.013; 5.85, $t^2 = 0.0030$), with a lifetime prevalence of 2.24% (95% CI = 0.29; 5.97, $t^2 = 0.0073$). Although the rates are like those observed in the general population, they are much lower than the rates observed in other reviews that examined PTSD symptoms in autistic populations. Subgroup analysis suggests that the presence of intellectual disability within the autism sample, the type of PTSD diagnostic criteria used, and the type of informants used during PTSD assessment impact prevalence rates across both child-adolescent and adult studies.

Conclusions: This meta-analysis provides valuable insights into the prevalence of PTSD among diagnosed autistic populations. It underscores the complex relationship between autism and PTSD whilst also highlighting the importance of reconsidering diagnostic criteria to identify and address trauma in this population more accurately.

436.066 Mechanisms of Action for a Culturally and Linguistically Adapted Intervention for Latino Young Adults with Autism Spectrum Disorder

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Background: Latino young adults with autism spectrum disorder (ASD) must navigate the transition to adulthood with few culturally and linguistically adapted interventions. By leveraging community based participatory research (CBPR) and identifying mechanisms of action, researchers can enhance engagement and efficacy in culturally adapted interventions. The present study seeks to fill a significant gap in the literature, as prior evaluations of group and individual interventions for adults with ASD have largely excluded Latinos. The present study is vital in addressing disparities in mental health services and outcomes for this demographic.

Objectives: The present study examines mechanisms of action in a culturally adapted therapy program for Latino young adults with autism spectrum disorder (ASD). The primary focus is to evaluate how improvements in social support, physical health, and cultural connectedness mediate mental health and adaptive functioning outcomes for young adults participating in a culturally and linguistically adapted intervention.

Methods: We conducted a pilot study involving 56 Latino autistic young adults (ages 18-25). Participants received the 12-week, *¡Iniciando! la Aduldez* intervention, which consists of telehealth-group therapy sessions for both parents and young adults. Additionally, young adults received weekly coaching therapy sessions to work on goals and family therapy sessions. Mechanisms of action—social support, physical health, and cultural connectedness—were assessed at five time points (baseline, mid-treatment, post-treatment, 3- and 6-month follow-ups). Mediation analyses will explore how these mechanisms influence changes in mental health (anxiety, depression), adaptive functioning, and caregiver burden. By adopting a CBPR approach, we ensured that the intervention remains culturally relevant and effectively addresses the specific needs of the community. This collaboration not only enhances the program's acceptance but also promotes sustainability and long-term impact.

Results: We expect that improvements in social support, physical health, and cultural connectedness will mediate positive changes in mental health, adaptive functioning, and caregiver burden among Latino autistic young adults and their families. Specifically, we anticipate that participants receiving the *¡Iniciando!* intervention will show significant reductions in anxiety and depression, enhanced adaptive functioning, and increased social and cultural support compared to the waitlist group. These mechanisms will likely explain the observed changes in outcomes we found in our pilot work in areas such as social cognition, adaptive functioning, and quality of life, reinforcing the importance of culturally tailored interventions for Latino populations with ASD.

Conclusions: Understanding mechanisms of action such as social support, physical health, and cultural connectedness will provide insights into how culturally tailored interventions can reduce mental health disparities and improve adaptive functioning in Latino young adults with ASD. This research not only aims to contribute to academic literature but also aspires to inform policy and practice, leading to improved health equity in mental health services. The findings have the potential to influence the development of future interventions, ensuring that they are grounded in the cultural and contextual realities of the communities they serve. By enhancing our understanding of these mechanisms, we aim to establish a framework that other researchers and practitioners can adopt to foster better outcomes for Latino individuals with ASD.

436.067 The Working Alliance of Parents, Young Adults, and Clinicians in a Transition to Adulthood Program

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Background: The working alliance, or the collaborative relationship between clients and therapists, plays a crucial role in therapy outcomes. A systematic review found that in 70.3% of studies, the working alliance mediated therapeutic outcomes, with stronger alliances correlating with greater symptom improvement. Furthermore, research suggests a bidirectional relationship between symptom improvement and working alliance: improvement in symptoms strengthens the alliance, while a stronger alliance contributes to further symptom improvement. For individuals with autism spectrum disorder (ASD), evaluating the working alliance presents unique challenges. For example, few studies have examined how working alliance may change over the course of treatment for young adults with ASD, especially within culturally and linguistically diverse populations.

Objectives: This study aims to examine the working alliance among bilingual, Latino young adults with ASD, their Spanish-speaking parents, and their clinicians during a transition-to-adulthood intervention. We sought to determine how the working alliance mediates outcomes in mental health and quality of life during this transition, exploring whether this relationship extends to diverse cultural contexts.

Methods: We conducted a pilot study involving 56 Latino autistic young adults (ages 18-25) and their Spanish-speaking parents. Participants were enrolled in the 12-week *¡Iniciando! la Aduldez* intervention, a telehealth-based group therapy program that includes group therapy for parents, group therapy for young adults, family therapy sessions, and weekly individual coaching sessions for young adults. Working alliance was assessed using the Working Alliance Inventory-Short Revised (WAI-SR) completed at week 2, mid-treatment, and post-treatment. We evaluated the relationship between several variables, including quality of life (measured by WHOQOL-BREF) and post-treatment outcomes, with mid-treatment working alliance as a mediator. Mediation analyses were conducted to assess the significance of working alliance in influencing changes in quality of life outcomes across participants. A correlation matrix was used to explore associations between cultural variables and working alliance.

Results: Preliminary analyses demonstrated that working alliance significantly mediated the relationship between baseline psychological well-being and post-treatment outcomes for both young adults and their parents. Participants who reported stronger alliances with their therapists at mid-treatment experienced greater improvements in overall quality of life by the end of the intervention. Notably, cultural variables examined (e.g., cultural connectedness, language) were not significantly associated with working alliance for any group (parents, young adults, or clinicians).

Conclusions: The findings suggest that the development of a strong working alliance transcended cultural factors within this specific intervention, underscoring the potential for culturally adapted programs to foster meaningful therapeutic relationships. The findings also highlight the central role of working alliance in promoting positive mental health and quality of life outcomes for Latino young adults with ASD and their families during the transition to adulthood. This study contributes to the growing body of research on therapeutic alliance, particularly within culturally adapted interventions, and underscores the importance of fostering strong alliances to maximize therapeutic efficacy. Despite challenges in measuring alliance within ASD populations, this study supports the potential of culturally responsive telehealth interventions to create meaningful alliances that promote successful transitions to adulthood.

436.068 Social Determinants of Health That Disproportionately Increase Mortality Risk Among Autistic Vs. Non-Autistic Older Adults: A Big Data, Machine Learning Study

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Background: Emerging literature suggests the health needs of autistic older adults require singular attention, distinct from younger autistic adults and older non-autistic adults. Prior studies found autistic older adults had significantly greater risk of mortality than non-autistic peers. However, we do not know which social determinants of health differentially impact time-to-mortality among autistic older adults relative to the general population. This is a barrier to identifying autistic older adults who would benefit from targeted preventive healthcare and support services.

Objectives: To identify social determinants of health that disproportionately increase mortality risk among autistic compared to non-autistic older adults.

Methods: In this quasi-experimental longitudinal cohort study, we analyzed inpatient and outpatient data from a 100% United States national sample of Medicare beneficiaries during 2013-2021. Medicare is a nationally administered program that provides nearly universal healthcare coverage to Americans aged 65 and older (including autistic and non-autistic older adults). Our total sample included 10,807 autistic older adults and 21,611 non-autistic older adults who were propensity score matched on sex, race, age, year, rurality, Charlson Comorbidity Index, county, and US state. The samples were divided into training (75%) and validation cohorts (25%). Our dependent variable was survival, calculated as years between age 65 and death or last observed healthcare encounter. The primary independent variable was group membership (i.e., autism vs. matched control). Social determinants of health included sex, race, rurality, and Social Vulnerability Index. We applied a machine learning technique ("Logic Forest") to identify subpopulations, based on social determinants of health, where autistic older adults had significantly higher mortality risk than non-autistic older adults. Results identified in the training cohort were validated in the mutually exclusive validation cohort.

Results: The validation cohort included 8,101 Medicare beneficiaries (n=2,701 autistic older adults). Beneficiaries were mostly male (67.9%), white/non-Hispanic (88.9%), and a majority resided in metropolitan areas (82.2%). Overall, 35.3% of autistic older adults and 17.9% of matched controls died during the observation period. Autistic older adults had 25% (95% CI=1.11-1.40) higher risk of mortality than matched controls. Multiple sub-populations were identified where autistic older adults had significantly higher mortality risk than non-autistic older adults. Among beneficiaries living in a small metropolitan area, autistic older adults had 42% (95% CI=1.09-1.84) higher risk of mortality. Among those who had low social vulnerability and were racially minoritized, autistic older adults had 50% (95% CI=1.22-1.85) higher risk of mortality. Among those with high social vulnerability and were white/non-Hispanic, autistic older adults had 54% (95% CI=1.03-2.29) higher risk of mortality. Sex did not differentially impact time-to-mortality for autistic older adults relative to matched controls.

Conclusions: Identifying subpopulations of autistic adults with disproportionately elevated mortality risk—like those living in small metropolitan areas, those with low social vulnerability who are racially minoritized, and those with high social vulnerability who are white/non-Hispanic—highlights the need for targeted preventive healthcare and support services. Future research should delve deeper into these factors to develop strategies that can effectively address health challenges faced by this growing demographic to improve health, wellbeing, and longevity.



436.069 Representation of Autism Mortality Data By Citing Authors: An Analysis of Articles Citing Hirvikoski Et Al., 2016

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Background: Understanding health outcomes across the lifespan, including mortality, is a high priority for the autistic community. High-profile publications and government reports state “people with autism die 16 years earlier” or have a “54-year life expectancy,” citing a rigorous landmark study of mortality among autistic people by Hirvikoski et al., 2016. Yet under 3% of autistic people died during the study’s observation period, making conclusions about the average age of death for the entire autistic sample, or about the life expectancy of all autistic people, a misrepresentation of findings.

Objectives: To quantify how often and describe in what ways key findings from Hirvikoski et al., 2016, a seminal work on mortality in autistic people, were accurately or misrepresented by citing authors

Methods: We conducted a systematic citation context analysis by searching MEDLINE, Scopus, CINAHL, PsychINFO, Web of Science, and PubMed to identify articles that cited Hirvikoski et al., 2016. We included articles that were available as full-text, peer-reviewed, and in English. Data extracted from each article included author, publication year, journal, Altmetric score, number of citations, and all passages of text where Hirvikoski et al., 2016 was cited. Next, two team members collaboratively reviewed citing passages from 20% of the articles to develop a codebook to guide article evaluation as incorrect/misleading, correct/accurate, or not relevant. Once finalized, we coded all remaining articles. We used descriptive statistics to summarize the characteristics of included articles.

Results: 506 articles were included. Most (n=356, 70.4%) were incorrect/misleading, 25.1% (n=127) were correct/accurate, and 4.5% (n=23) were irrelevant. Articles that cited all-cause mortality findings were significantly (p<0.001) more often categorized as incorrect/misleading, while articles that cited suicide findings were significantly (p<0.001) more often categorized as correct/accurate. Among articles that correctly represented findings (n=127), 55.9% cited the higher death by suicide rate, 37.8% cited the higher all-cause mortality rate, and 7.9% cited broad references to health inequities experienced by autistic people. Among articles that misrepresented findings (n=358), the most common misrepresentation was referring to “premature mortality” (53.7%), defined as the proportion of deaths occurring prior to the national average age of death, which was not quantified by Hirvikoski et al., 2016. Other frequently observed misrepresentations included conflating suicidality with death by suicide (17.1%), making unsupported conclusions about life expectancy of autistic people (16.6%), and over-generalizing the findings regarding mean age of death of decedents (15.7%). Other articles (17.7%) misrepresented odds ratios comparing deaths by suicide between autistic and non-autistic people, by conflating the largest odds ratio with the leading cause of death (8.4%) or by inaccurately or incompletely reporting the odds ratio (9.3%).

Conclusions: We found widespread misrepresentation of mortality findings by citing authors. Misrepresenting mortality findings may have serious unintended consequences for autistic people including psychological harm, compromised ability to obtain commercial health or life insurance, altered retirement planning decisions, and perpetuation of health disparities. As such, we assert that there is a moral imperative for authors, peer reviewers, and journals to be accountable for the accurate representation of findings from cited studies.



436.070 Life Satisfaction Outcomes for Adults with Autism and/or IDD Enrolled in Life-Long Learning and Recreation Community Program

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Background: Data from the CDC estimated around 28.7% of adults in the USA have a disability in 2022, 13.9% of whom have a cognitive disability (Prevention, 2024). As the population of adults with intellectual and developmental disabilities (IDD) including autism (ASD) continues to grow in the USA, research is important in understanding how services and programming designed for adults with autism and developmental disabilities contributes to positive quality of life (QOL) outcomes. Starting in 2021, selected questions from the WHO Quality of Life Intellectual and Developmental Disabilities module (WHOQOL-DIS)(Group, 2011) were used to assess QoL and life satisfaction measurements of adults 18+ with IDD and/or autism enrolled in a community-based life-long learning and recreation program.

Objectives: The primary goal of this study is to explore how participation in age-appropriate life-long learning and recreation community centers for adults with autism and IDD contributes to positive QoL outcomes over time. This study seeks to compare Life Satisfaction outcomes between participants with and without autism.

Methods: Data were collected via electronic surveys from adults with IDD enrolled in a life-long learning and recreation community program and/or their proxies, using selected items from the WHOQOL-DIS and demographic information. Baseline data were collected from returning participants upon returning to in-person services post-COVID restriction in June 2021, or at new intake appointments. The follow-up survey was administered in January 2024. Data analysis was conducted in R Studio (Version 2023.06.2). A two-way repeated measures ANOVA was employed to assess mean differences in QoL across two time points (baseline vs. follow-up) and between groups (ASD vs. non-ASD) for participants who completed both surveys. In addition, paired t-tests were conducted to compare QoL between ASD and non-ASD groups at baseline and follow-up separately.

Results: A total of 173 surveys were completed at baseline (M age = 26.21, SD = 6.72; 87 non-ASD, 86 ASD), and 94 surveys were completed at follow-up (M age = 27.82, SD = 6.91; 46 non-ASD, 48 ASD). Of these, 35 participants (21 non-ASD, 14 ASD) completed surveys at both time points, but no significant changes in QoL Life Satisfaction were observed over time. At baseline, no significant differences in QoL were observed between the ASD (M = 3.83, SD = 1.15) and non-ASD (M = 4, SD = 1.02) groups. However, at follow-up, a significant difference in overall life satisfaction was found between the ASD (M = 3.75, SD = 0.98) and non-ASD (M = 4.17, SD = 0.95) groups, with $t(92) = 2.13, p = 0.036$, and a small effect size (Cohen's $d = 0.44$).

Conclusions: This study highlights the importance of recognizing and addressing the unique needs of adults with IDD in improving QoL outcomes. While baseline QoL was similar between ASD and non-ASD groups, follow-up data revealed lower life satisfaction in the ASD group, emphasizing the importance of understanding and addressing factors that impact long-term QoL in adults with ASD. Further research is needed to explore these factors and develop strategies to promote lifelong positive outcomes for this population.

Poster Session**437 - Brain Function (fMRI, fcMRI, MRS, EEG, ERP, MEG) II**

May 3rd, 2025, 12:30 PM - 1:30 PM - Hall 4A

437.071 Longitudinal EEG Investigation of Syllable Entrainment and Word-Segmentation in Infants at Low and High Likelihood for Autism

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Background: Autism Spectrum Disorder (ASD) often presents with early language delay that can impact many developmental domains. To avoid those detrimental cascading effects, it is essential to detect and support early verbal difficulties early on. In this regard, implicit neuroimaging measures have the potential to assess key preverbal mechanisms for language acquisition. Previous studies of autistic individuals identified decreased cortical synchronization to syllable input, as well as difficulties in the computation of statistical properties contained within speech input - a process known as statistical learning. However, the maturation pattern of those speech processing mechanisms remain under-explored in the infant period, in ASD as well as in typical development (TD).

Objectives: We aim to define the trajectories in infants at high and low likelihood for ASD for (1) cortical entrainment to syllables, (2) word discovery within a speech input using its statistical properties, and (3) memorizing the discovered words.

Methods: We collected 83 longitudinal high-density EEGs in 44 infants (2.5-22.6 months) at high (HL) and low (LL) likelihood for ASD. We measured neural entrainment at syllable and word rates during exposure to a multi-speaker speech stream containing trisyllabic words, then collected ERPs during a word recognition procedure. Data were analyzed with longitudinal partial-least square correlation (PLS-c), a multivariate data-driven approach.

Results: We found a decreased neural entrainment to syllables in HL infants compared to LL. Moreover, this finding was associated with HL verbal outcome at 24 months. However, HL infants' ability to detect words using statistical learning was globally preserved, although it followed a different age-trajectory compared to LL. HL infants also showed reduced neural response to the presentation of learned vs novel words, possibly caused by atypical maturation of the memory system and/or reduced orientation to novelty. Our results might reflect a less precise response along the auditory processing pathway in HL, while statistical learning might represent a relatively spared mechanism on which HL infants rely.

Additionally, the multi-speaker nature of our stimulus might have played a role, HL infants paying possibly less attention to voice changes.

Conclusions: We highlighted the crucial role played by longitudinal implicit metrics of infant language processing to unveil fine-grained cascading effects involved in ASD. This prompts the development of early assessment tools using neural entrainment measures to estimate verbal outcome in HL, as well as early intervention strategies supporting the precision of brain response to syllables.

437.072 Longitudinal Stability of Neural Responses to Faces and Relation to Social Behaviors in Autistic Youth: Results from the Autism Biomarkers Consortium for Clinical Trials

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Background: Face processing has been proposed as a potential biomarker of social function because it is a fundamental skill related to social communication. Individuals with autism show slowed neural speed (longer N170 latencies) of face processing compared to typically developing youth (Webb et al., 2021, 2023; Hileman et al., 2011) and adults (Kang et al., 2017). Latencies of the P100 and N170 are moderately stable over six weeks in autistic youth and slower N170 latency corresponds to lower verbal and non-verbal IQ (Webb et al., 2023).

Objectives: In this Autism Biomarkers Consortium for Clinical Trials (ABC-CT) project, we (1) Examined ERP stability from T1 (baseline) to T4 (+4 years) for Faces ERP variables. (2) Examined concurrent relation of ERP to behaviors at T4. (3) Examined acquisitional, demographic, and behavioral factors predicting stability between T1 and T4 ERP latencies.

Methods: T4 data were collected from 90 autistic youth (M=12.8 yrs, SD=1.8) and 62 typically developing controls (TD) (M=12.5 yrs, SD=1.8) 4.2 years (SD=.66) after T1. At T1, ASD diagnosis was confirmed by gold-standard measures. ERP data was acquired while participants watched pictures of upright and inverted faces and houses (as in Webb et al., 2021, 2023). Analyses included participants with valid Faces ERP data at both T1 and T4. Social Behaviors were characterized using the Vineland Adaptive Behavior Scales-3 (VAB3) and the Social Responsiveness Scale (SRS-2).

Analyses were conducted separately by diagnostic group. (1) Intraclass correlation coefficients (ICC) were used to examine stability in latency of ERP components. (2) Pearson Correlations examined relationships between ERP components (upright and inverted faces) and behavior. (3) To predict T4 ERP latencies, Linear Regression was calculated using predictors: T1 ERP latency, T4 acquisition variables, demographics (age, sex), and behavioral predictors (IQ, VAB, SRS).

Results: (1) ICC values are presented in Table 1; values were poor to moderate across four years. (2) In ASD group, Face Upright N170 latency was correlated with VAB Socialization ($r=.275$) and Daily Living Skills ($r=.284$; also with Face Inverted $r=.230$). No relations were found with full scale IQ or SRS SCI score (r values $<|.078|$). In the TD group, there were no significant correlations between behavior and ERP values.

Conclusions: In contrast to previous research demonstrating moderate short-term stability, latencies of the P100 and N170 were more variable over four years in autistic youth, except for the P100 responses to upright face. In our older T4 sample, latency to faces did correspond to components of social skills and daily living behavior. In comparison to previous results, novel relations to behavior were found at older ages suggesting that brain-behavior relations may change with age. Analyses are ongoing and will further examine predictors of T4 ERP latency including adaptive skills, T1 ERP latencies, demographics, and acquisition variables.



437.073 Mirror Neurons and Theory of Mind in Autistic Youth Post-Social Skills Intervention

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Background: Research on imitation, a feature of the mirror neuron system (MNS) and an important facet of social interactions suggest it is less pronounced in autistic youth (Chan & Han, 2020). In autistic youth, overconnectivity in the MNS was associated with increased social difficulties in a cross-sectional study (Fishman et al., 2014). However, the impact of targeted social skills interventions on MNS connectivity and its association with ToM performance has not been fully explored yet.

Objectives: To examine whole-brain functional connectivity of the inferior frontal gyrus (IFG; MNS hub) and its relationship to ToM in autistic youth, compared to typically developing (TD) controls after a social skills intervention.

Methods: Autistic youth completed The Awareness of Social Inference Test (TASIT; McDonald et al., 2006), the Social Attribution Task-Multiple Choice (SAT-MC; Johannesen et al., 2013), and imaging scans pre- and post- the 14-weeks Program for the Education and Enrichment of Relational Skills (PEERS; Laugeson et al., 2012) social skills intervention. Resting-state functional MRI data were acquired via a Siemens 3T PRISMA scanner for 15 autistic ($M_{age} = 14$, 73.3% male) and 11 TD ($M_{age} = 15$, 58.3% male) youth. FSL (Smith et al., 2004) and AFNI (Cox, 1996) were used for preprocessing and bandpass filtering ($0.008 < f < .08$ Hz). ICA-AROMA (Pruim et al., 2015) addressed motion confounds. A bilateral IFG mask was created using the Harvard-Oxford atlas (Desikan et al., 2006). Global time series from this mask were correlated with whole-brain signal. Final connectivity maps were normalized using Fisher r-to-z transformations. AFNI's 3dClustSim (Cox et al., 2017a, 2017b) estimated the probability of false positives while running paired t-tests for group-level comparisons. Pre- and post-intervention change scores calculated from Z' (prime) scores extracted from significant clusters within the autistic youth group were used to examine correlations between IFG connectivity and change scores derived from pre- and post-intervention total raw scores TASIT and SAT-MC.

Results: Pre-intervention between group comparisons of IFG connectivity were nonsignificant, $p > .05$. Post between-group comparisons showed whole-brain underconnectivity of the IFG with the right lingual gyrus (RLG) in autistic youth compared to controls, $p = .01$. There was a significant difference between SAT-MC scores pre- ($M = 16.33$, $SD = 2.49$), and post- ($M = 17.27$, $SD = 1.71$) PEERS intervention, $t(14) = -2.36$, $p = .017$. The correlation between SAT-MC scores and IFG connectivity post-intervention were nonsignificant, $p > .05$. Differences for TASIT scores pre- to post-intervention were nonsignificant, $p > .05$. However, IFG underconnectivity in the autistic group post-intervention was negatively correlated with TASIT scores, $r = -.61$, $p = .016$. Such that, ToM performance improved on the TASIT with greater underconnectivity of the IFG to RLG.

Conclusions: Findings support previous research showing that autistic youth have difficulties in ToM, but social skills interventions can help improve ToM. Underconnectivity between the IFG and RLG visual area may be a compensatory mechanism post-intervention, which may help improve social outcomes. This research suggests integrating neurobiological insights into social skills training for more effective interventions for autistic youth.



437.074 Multimodal Brain Imaging in Autism Spectrum Disorders in Patients with SHANK3 Mutations

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Background: Genetic mutations can be specifically identified in approximately 30% of individuals with autism spectrum disorder (ASD) (Munnich et al., 2019). Among these, mutations in the *SHANK3* gene (22q13.3), which encodes a post-synaptic scaffolding protein, occur with higher frequency. However, brain MRI abnormalities have rarely been explored in ASD patients with *SHANK3* mutations.

Objectives: This study aimed to investigate anatomical and brain perfusion abnormalities in children with ASD and *SHANK3* mutations and to assess the relationship between these abnormalities and the type of mutation.

Methods: We conducted a retrospective study including 36 patients with ASD and *SHANK3* mutations (aged 2–22 years, mean age 6.6 ± 4.8 y) who underwent MRI at Necker Hospital, Paris. Among these, 15 had a complete deletion (Phelan-McDermid syndrome; Group A), while 21 had partial deletions or point mutations (Group B). Anatomical MRI, including 3D T1-weighted FSPGR, axial and coronal FSE T2-weighted imaging and coronal FLAIR sequences, were reviewed by an expert neuroradiologist. Arterial spin labeling MRI (ASL-MRI), a non-invasive technique for measuring cerebral blood flow (CBF) at rest, was performed on a subgroup of 7 patients (aged 2–5 years) and 21 age-matched comparison children. A whole-brain voxel-wise analysis was conducted to compare rest CBF between patients and controls. Statistical analyses were performed using SPM12, controlling for age as a confounding variable, with a significance threshold of $p < 0.05$ corrected for multiple comparisons (FWE).

Results: Clinical analysis of anatomical MRIs from the entire patient group ($n=36$) showed that 14 patients had normal MRI scans, while 15 had clearly defined abnormalities, including dysmorphic corpus callosum (14 patients), cortical atrophy (7 patients; Figure 1), and temporal pole abnormalities (5 patients). In Group A ($n=15$), all patients showed MRI abnormalities. In Group B ($n=21$), 13 patients exhibited MRI abnormalities. Additionally, cortical atrophy was significantly more frequent in Group A (6/15) than in Group B (1/21) ($p = 0.01$). Voxel-wise whole-brain ASL analysis revealed significant reductions in rest CBF in the bilateral superior temporal regions, left superior frontal gyrus, left precentral gyrus and left supramarginal gyrus in *SHANK3* patients compared to controls (Figure 2). No increases in CBF were observed in *SHANK3* patients.

Conclusions: Our findings align with previous studies that reported temporal pole MRI abnormalities in children with ASD without identified genetic mutations (Boddaert et al., 2009). Additionally, our results suggest that cortical atrophy may be specifically associated with a complete deletion of *SHANK3*. The observed hypoperfusion in the superior temporal regions, which are crucial for social cognition, are consistent with prior brain imaging studies in idiopathic ASD. This is the first study to investigate brain perfusion abnormalities in *SHANK3* patients, highlighting the importance of advanced imaging techniques for understanding the neurobiological mechanisms underlying ASD associated with genetic mutations.



437.075 Network Mechanisms Underlying Core Behavioral Features in Fragile X Syndrome

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Background:

Fragile X Syndrome (FXS) is characterized by intellectual disability, sensory hypersensitivities, executive dysfunction, and autistic characteristics. Current treatments only target specific psychiatric features (e.g., anxiety and irritability) and not cognitive features, which are more pressing for patients and families, due in part to poor insight into underlying neural mechanisms. Recent work from our group using resting state electroencephalography (EEG) has linked abnormal functional connectivity (FC) and specific microstates (i.e., transient, quasi-stable spatial patterns of brain activity across the scalp) to cognitive disruptions and lower IQ making FC an ideal target for investigation. The current study aims to evaluate the underlying functional network disruptions using EEG to examine FC in source space during resting state and during a cognitive flexibility task.

Objectives:

We aim to identify mechanisms contributing to functional disruptions in frontoparietal and temporal networks, with the goal of generating more specific, targetable biomarkers of the neurophysiology supporting cognition.

Methods:

A preliminary microstate analysis was conducted on resting state EEG data from 70 adult individuals ($N=36$ FXS and 34 typically developed controls (TDC)) ages 16-45, using the +Microstate Toolbox (K-means clustering to define microstates. Both a 4-cluster solution (i.e., replicates canonical microstates) and a 6-cluster solution were generated to replicate Takarae et al., 2023. Peak alpha frequency was also calculated as a proxy for cognition. The final results will include microstate outcomes from 80 adults ($N = 40$ FXS, 40 TDC) ages 18-36 to avoid both aging and developmental effects on cognition. Relationships between microstates and clinical measures indexing cognition will be evaluated using FC summary scores that represent whole functional networks as mediators within our statistical models. This approach aims to elucidate how specific underlying network disruptions correspond to distinct clinical features of FXS.

Results:

Preliminary results show elevated global variance explained (GEV), i.e., the amount of original EEG data explained by the microstate solution, across microstates differed significantly between groups for both the 4-microstate solution ($F(2, 67)=12.76, p<.001, ES=.16$) and the 6-microstate solution ($F(1, 68)=7.46, p=.008, ES=.1$). Individuals with FXS exhibited greater GEV (**4:** $M = 61.2\%, SD = 7.8\%$; **6:** $M=64.4\%, SD=7.1\%$) compared to TDC (**4:** $M=56.1\%, SD=8.4\%$; **6:** $M=59.3\%, SD=8.4\%$) (see figure). Further, GEV was inversely correlated with frontal peak alpha frequency ($r = -.28, p = .019$), with higher GEV associated with lower PAF. Next steps will include the FC analysis and assessment of a cognitive task where we hypothesize that there will be disruptions in the salience network, a network related to stimulus detection and attention, which will predict network stasis and difficulties with cognitive flexibility. Further, we will address whether microstates can be used as a less computationally intensive way to capture FC dynamics in FXS.

Conclusions:

The GEV findings are in alignment with prior findings in FXS where GEV elevation suggests network stasis and may reflect disruptions to underlying functional networks which may be associated with distinct cognitive and behavioral features of FXS, as suggested by the correlation with PAF.



437.076 Neural Correlates of Executive Functioning in Autistic and Non-Autistic Youth

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Background: Executive functioning (EF) is an umbrella term for higher order cognitive processes that underlie goal-directed behavior (Gioia et al., 2000). EF has been proposed as an endophenotype of autism (Demetriou et al., 2020). Yet, there is significant heterogeneity across EF domains and autistic individuals that may be explained with research on the underlying neurophysiological characteristics (Yeung et al., 2024).

Electroencephalographic (EEG) spectra analyses during resting-state tasks capture such neural processes (Saby et al., 2012). Theta (4-8 Hz), alpha (8-13 Hz), beta (13-30 Hz), and gamma (30-80 Hz) all relate to different EF processes (Pizzagalli, 2007; Schürman & Başar, 2001; Neuper & Pfurtscheller, 2001), but only one small study on autistic and non-autistic preschoolers (n=29) investigated the relation among theta/beta ratio and EF, with research needed on other power spectra in larger samples (Zhao et al., 2023).

Objectives: This study will investigate the relation among frontal resting state EEG power and EF in a large sample of autistic and non-autistic youth. It was hypothesized that Delta, Theta, and Beta would correlate with EF.

Methods: Data for the current analyses were collected as part of the ACE GENDAAR network, a study aimed at investigating sex and gender differences in autistic and non-autistic youth. In the current study, participants included autistic (n=136) and non-autistic (n=136) 8-to-17 year olds ($M=12.86$ years, $SD=2.90$) with $IQ > 70$ ($M=107.09$, $SD=19.03$). The sample was 46% female (n=125). High density EEG was collected while participants completed an eyes-open resting state task. Regions of interest were created to improve signal-to-noise estimates by averaging the absolute power across electrodes in the frontal left, medial, and right regions. EF was characterized using the Behavior Rating Inventory of Executive Function (BRIEF). Given differences in EF and power spectra between autistic and non-autistic youth, correlations were run separately.

Results: For autistic participants, absolute power in the Beta band was positively correlated with the Shift ($r=.20$) and Organization of Materials subscales ($r=.18$), as well as with the Behavior Regulation Index ($r=.17$) and Global Executive Composite (GEC) ($r=.17$). For the non-autistic group, the Plan/Organize subscale was negatively correlated with absolute power in the Delta band ($r=-.18$). See Table 1 for results from the non-autistic group and Table 2 for results from the autistic group.

Conclusions: As Beta relates to task engagement and alertness, autistic individuals with more global and specific EF challenges may be more engaged and alert at rest (Wang et al., 2013). Non-autistic individuals with challenges in planning/organizing may show lower attention and motivation at rest, as indicated by the correlation with Delta power (Knyazev, 2012). Although research on non-autistic individuals often reports that higher theta relates to lower EF, no correlations with Theta emerged in the current sample, likely due to the older age range in our sample (Tan et al., 2024). Future research should investigate power during EF-specific tasks.

**437.077 Neural Effects of Creative Movement, General Movement, and Sedentary Play Interventions on Interpersonal Synchrony in Children with Autism Spectrum Disorder: A Preliminary fNIRS Study**

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Background: Children with Autism Spectrum Disorder (ASD) demonstrate difficulties in interpersonal synchrony (IPS)¹, which is linked to atypical activation in brain regions associated with the Observation Execution Matching System (OEMS)². Specifically, this includes hypoactivation in the Inferior Frontal Gyrus (IFG) and Superior Temporal Sulcus (STS), as well as hyperactivation over the Inferior Parietal Lobule (IPL)^{2,3}. Additionally, children with ASD fail to show enhanced OEMS activation when provided with more social information⁴. While creative movement (CM) interventions have shown promise in improving social, cognitive, and motor skills in children with ASD⁵, the underlying neural mechanisms remain poorly understood.

Objectives: This pilot randomized controlled trial (RCT) aims to explore the behavioral and neural effects of CM, General Movement (GM), and Sedentary Play (SP) interventions in children with ASD, using a drumming task to measure IPS.

Methods: Twenty-four children with ASD, aged 5 to 14 years, were recruited and randomly assigned to one of three groups: CM, GM, or SP. All groups participated in 16 training sessions over 8 weeks (two sessions per week). The CM group engaged in rhythmic musical, dance, and yoga-based activities aimed at improving whole-body coordination, praxis, and IPS. The GM group participated in exercise and locomotor games targeting coordination, strength, and endurance. The SP group, modeled on standard care, engaged in sedentary activities such as reading, building, and arts and crafts to enhance communication and fine motor skills. Before and after the intervention, participants completed a drumming task under two conditions: 1) Solo, where they matched alternating hand movements to a metronome, and 2) Social, where they synchronized their movements with an adult partner. During the task, cortical activation in the IFG, middle frontal gyrus (MFG), STS, and IPL was measured using functional Near-Infrared Spectroscopy (fNIRS). Video recordings of the sessions were analyzed for rhythmic, synchrony, and mirroring errors.

Results: After 8 weeks, children in the CM group showed significant improvements in IPS, with fewer rhythmic, synchrony, and mirroring errors ($ps < 0.05$; 75%–87.5% of children followed this trend). Additionally, the CM group demonstrated the most widespread increases in socially enhanced activation in the left IFG, STS, and MFG ($ps < 0.10$; Hedge's $g = 0.68$ – 1.34 ; 87.5%–100% of children followed this trend). The GM group showed increased activation in the left IFG ($ps < 0.05$; Hedge's $g = 1.27$; 71.4% of children), while the SP group exhibited increased activation in the left STS ($p < 0.01$; Hedge's $g = 1.07$; 71.4% of children). Children with lower baseline adaptive functioning, social responsiveness, and socially enhanced activation experienced greater IPS improvements post-intervention ($r = 0.41$ – 0.45 , $ps < 0.05$).

Conclusions: The current study supports the use of CM intervention in enhancing IPS performance in children with ASD and highlights the potential of fNIRS as a tool for tracking and predicting intervention outcomes.



437.079 Acquisition Stability of Resting-State EEG and Relation to Adaptive and Cognitive Functioning in Autistic Children: Results from the Autism Biomarkers Consortium for Clinical Trials (ABC-CT)

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Background: A key metric of biomarker evaluation is understanding how factors that influence acquisition may impact generalizability of data to new populations. In a previous publication from the Autism Biomarkers Consortium for Clinical Trials (ABC-CT; Webb et al., 2023), children who did provide EEG data were older, had higher IQ scores, and greater adaptive skill compared to those that did not.

Objectives: This project extends this work to examine if child characteristics continue to influence acquisition across timepoints. Specifically, children in the ABC-CT were invited to return for 4 visits, T2 was +6 weeks, T3 was +6 months and T4 was +4 years. We examined: (1) The relationship between EEG data acquisition variables and adaptive functioning and cognition, and (2a) Short, medium and long term stability of resting alpha power (6-12.99 Hz) and then (2b) considered how acquisition performance and adaptive and cognitive skills influenced stability. **Methods:** The ABC-CT is a longitudinal study including autistic (N=280) and typically developing (TD, N=119) children aged 6-to-11 years-old. Of the original 399 participants, 226 (N_{ASD}=148, N_{TD}=78) returned for T4, 4.2yrs (SD=.66) after completing T1. (1) Pearson's correlations examined the relationship between age, verbal and nonverbal IQ, adaptive skills via the Vineland Adaptive Behavioral Scales, and EEG data acquisition variables (number of attended, artifact, and total valid trials). (2) Intraclass correlations were used to examine the stability of resting alpha (6-12.99 Hz) power. (3) We will use regression analysis to examine if T1 baseline values (acquisition variables, age, time between T1-T4, adaptive and cognitive skills) predict either T4 values or T1-T4 change; analyses for Aim 3 are ongoing.

Results: (1) Correlations between acquisition variables and IQ were present at T1 and T3, but not at T4 (see Table 1). Relation to adaptive skills was present at all timepoints. Correlation with social skills were not present at baseline but were at later time points. The pattern of results suggests similar child behavior relations for attention vs signal artifact (motion, eye movements). (2) Intraclass correlation showed moderate stability of alpha power over the four time points for the ASD group (see Table 2). While the ICC2 values for alpha power lowered over subsequent time points, they remained moderate overall, in both younger and older participants, and in the ASD high IQ subgroup.

Conclusions: In agreement with the initial findings at T1 (Webb et al., 2023), children in the ASD group who provided more valid EEG data were older and had better communication and daily living skills. Resting State alpha power maintained moderate stability throughout the multi-year study. For generalizability, the ABC-CT used a fixed acquisition protocol that did not allow for individualized behavioral support for autistic children and thus may underestimate abilities of autistic children when individualized strategies can be implemented. These data provide direction for developing better acquisition supports for children who may struggle with the procedure.

**437.080 Neurocomputational Correlates of Autism: Exploring 1/f Power and Narrowband EEG Activity across Genders**

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Background: Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder characterized by difficulties in social interaction and communication, with sex-based differences in presentation that complicate diagnostics, particularly for females. The power-law exponent, a key neurocomputational measure, reflects the 1/f slope of EEG spectra and may provide insights into the neural dynamics underpinning these sex differences. This study aims to investigate sex-based differences in brain organization in autistic and neurotypical populations by examining broadband 1/f characteristics and narrowband EEG power.

Objectives: This study investigates the differences in the 1/f power-law exponent between male and female autistic participants and neurotypical controls, as well as the relationship between broadband (1/f) and narrowband (theta, alpha, gamma) EEG activity.

Methods: 5 minutes of continuous resting-state (eyes-closed) EEG data was collected for 19 autistic young adults (10 F, age 18-27, M = 20.7, SD = 1.8), and 23 neurotypical controls (14 F, age 18-27, M = 21, SD = 1.8), using a 64-channel EGI Hydrocel Geodesic Sensor net and Netstation EEG acquisition system. The data was analyzed to quantify the 1/f power spectrum using Irregular Resampling Auto-Spectral Analysis (IRASA; Wen & Liu, 2016), and amplitude spectra for frequency ranges of interest were calculated using fast Fourier transforms in MATLAB; peak amplitude within each frequency range was squared to obtain band power. Recursive Feature Selection (RFE) machine learning algorithm was applied to identify electrode sites most salient for participant neurotype classification based on neurotype and sex.

Results: Female autistic participants exhibited significantly larger 1/f power-law exponents than female neurotypical participants over centro-parietal regions, coupled with significantly reduced alpha power in the same areas. Comparisons between female and male autistic participants revealed greater 1/f exponents over left anterior regions in females, alongside reduced gamma power. RFE analysis identified right anterior and left parietal electrode sites as highly salient for distinguishing between ASD and neurotypical participants, with increased delta power in ASD males relative to neurotypical males at left parietal sites ($p < .043$) and increased theta power in neurotypical males ($p < .049$).

Conclusions: Significant sex differences in the 1/f power-law exponent suggest distinct neural organizational patterns between male and female autistic individuals, particularly in the left anterior and fronto-parietal regions associated with language and executive function. These findings underscore the need for sex-specific approaches in ASD diagnostics and interventions. The correlation between broadband 1/f measures and narrowband theta, delta, and gamma band activity further indicates that functional brain organization differences captured by 1/f analysis manifest in both broadband and narrowband EEG activity.

437.081 Neuroepigenetics in Autistic Adults: An In Vivo Brain Imaging Study

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Background:

Interactions between genes and environment, mediated through epigenetic mechanisms, are involved in autism spectrum disorder (ASD). Preclinical and human studies have implicated epigenetic mechanisms, including acetylation, in ASD (reviewed in Tseng et al., 2022). Histone deacetylases (HDACs), epigenetic enzymes that decrease acetylation of the DNA, can be measured using positron emission tomography (PET) and [¹¹C]Martinostat. [¹¹C]Martinostat binds to HDAC1, 2, and 3, which are closely associated with neuroplasticity and cognition (Wey et al., 2016).

Objectives:

Assess whether regional HDAC expression is altered in autistic adults compared to age- and sex-matched controls (CON) and assess whether HDACs are associated with ASD core symptoms in autistic adults.

Methods:

Seventeen autistic adults (11M/6F, age=25.82±6.28 years) and 22 non-autistic CON (11M/11F, age=28.32±5.55 years) completed a simultaneous PET and magnetic resonance imaging (MRI) scan with [¹¹C]Martinostat. Autistic adults met the DSM-5 diagnosis for ASD, and the scores on the Autism Diagnostic Observation Schedule, Second Edition (ADOS-2), Module 4 supported the diagnosis (ADOS-2 social interaction+communication score: 13.79±3.93, N=14). Autistic adults had to have an intelligence quotient (IQ) at or above 35.

For autistic participants, behavioral symptoms were assessed based on caregiver-report questionnaires (N=16), including the Social Responsiveness Scale, Second Edition (SRS-2), Aberrant Behavior Checklist, Second Edition (ABC-2) Social Withdrawal and Stereotypic Behavior subscales, and Repetitive Behavior Scale, Revised (RBS-R). Receptive vocabulary was measured using the Peabody Picture Vocabulary Test, 4th Edition (PPVT-4).

[¹¹C]Martinostat PET data from 60-90 minutes post-radiotracer injection were reconstructed into standardized uptake value (SUV) maps and normalized by the whole brain mean (SUVR). Whole brain voxelwise analyses were conducted using a general linear model with mixed effects and ordinary least squares ($Z > 2.3$, p-cluster corrected < 0.05). Analyses were run to i) compare [¹¹C]Martinostat SUVR between ASD and CON and ii) test for associations between [¹¹C]Martinostat SUVR and behavioral and language measures in ASD, controlling for age and sex.

Results:

Between-group analysis showed elevated HDACs in the visual cortex and lower HDACs in the insula, hippocampus, and orbitofrontal cortex in ASD compared to CON (Figure 1). In terms of associations with behavioral scales, lower HDACs in the right middle frontal gyrus were associated with higher scores on the Social Withdrawal subscale of the ABC-2, indicating more severe social withdrawal. Lower HDACs in the cerebellum and higher HDACs in the precuneus were associated with higher scores on the Stereotypic Behavior subscale of the ABC-2, indicating more severe stereotypic behavior. No other associations between HDACs and behavioral symptoms or language scores were found.

Conclusions:

In ASD, we observed regionally altered HDACs in areas involved in socio-emotional processing. The finding of lower HDACs in multiple brain regions aligns with previous findings of lower acetylation near HDAC genes in ASD (Sun et al, 2016). Regional HDACs were associated with symptoms of social withdrawal and stereotypic behavior in ASD, with lower regional HDACs in frontal and cerebellar areas being associated with more severe symptoms. Future work will expand the current sample size to assess potential sex-differences.

**437.082 Neurophysiological Indicators of Neurodevelopmental Outcomes**

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Background: Children born preterm (< 37 weeks gestational age) are at an elevated likelihood for autism (ELA) and intellectual disabilities (ID). Event-related Potentials (ERPs) are a non-invasive method of measuring brain activity and have the potential to identify important neurodevelopmental outcomes. Enhanced auditory discrimination, measured by the difference in the neural response to alternating sounds around 100ms post stimulus, is associated with autism, while reduced neurophysiological habituation to repeated sounds during an identical time period is correlated with a lower IQ. These two auditory perceptual measures can be quantified within the same experiment, allowing for an examination of the differential role of neurophysiological processes as indicators for autism and cognitive ability.

Objectives: The present study sought to examine whether early auditory discrimination and habituation could differentially predict autistic traits and cognitive abilities, respectively, among a sample of school-aged children born preterm. Secondly, we assessed brain-behaviour associations between ERPs and sensory features (i.e., sensory sensitivity).

Methods: ERPs were elicited using an auditory oddball paradigm consisting of alternating standard 1200Hz (80%) and deviant 1000Hz (20%) tones from 22 school-aged (mean age = 6 years, SD = 0.5) children born preterm (mean gestational age = 27.2 weeks; SD = 1.9 weeks). Mean amplitudes of the P1 discrimination difference wave (deviant – standard) and P1 habituation difference wave (first standard – second standard) were extracted from a frontocentral electrode cluster (E5, E6, E7, E12, and E106). Cognitive abilities (FSIQ) were assessed using the Stanford-Binet, fifth edition and autistic traits were measured with the Child Autism Quotient. Sensory features were measured using the Sensory Profile, Second Edition (SP-2). Two linear regressions were conducted with the neurophysiological measures as predictors and neurodevelopmental features as dependent variables, followed by a series of Pearson bivariate correlation tests.

Results: A larger P1 discrimination led to a greater caregiver endorsement of autistic traits ($F(2, 18) = 5.468, p = .004, R^2 = .31$), but P1 habituation did not predict FSIQ ($F(2, 19) = 0.1295, p = .6362$). Enhanced auditory discrimination was also associated with higher caregiver-ratings of sensory sensitivity ($r(20) = -.66, p = .002$).

Conclusions: This study established the P1 discrimination as an emerging neurophysiological predictor of autistic traits among ELA children born preterm. Further, the P1 discrimination may be uniquely associated with restricted and repetitive behaviors in autism. Future researchers may seek to replicate and extend these results in a longitudinal design with a large, diverse sample.



437.083 New Dynamic Facial Expression EEG Signatures Reveal Perceptual and Attentional Features Associated with Social Communication and GABA Phenotypes in Autism: A Link with the Third Visual Pathway

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Background: Autism is characterised by core differences in social communication and interaction. The underlying neurobiology can be investigated through experimental designs that capture the dynamic nature of social perception, which activates the third visual pathway.

Objectives: Here, we investigated dynamic specific facial emotion processing using a naturalistic paradigm, leading to a dynamic N170 (dN170). Our dynamic facial emotion recognition task allowed to obtain a specific face expression sensitive - dN170, with a contrast against a neutral face baseline, leading to a specific facial emotion processing signal. The paradigm we employed demonstrates ecological validity, offering a more naturalistic approach to social cognition. This allows to elucidate the role of event-related potentials (ERPs) markers, specifically the face-sensitive dN170 and a dynamic P300 (dP300) in autism, as well as across the spectrum from non-autistic to autistic individuals. We further aimed to investigate the complex interplay between neurophysiological signatures, neurometabolite profiles, as measured by magnetic resonance spectroscopy (MRS) and social communication abilities.

Methods: Sixteen autistic children/adolescents (11 males and 5 females; mean (M) age =13.31±2.182 years) were recruited from the Neurodevelopmental and Autism Unit (ULS, Coimbra, Portugal). The other group comprised 16 non-autistic (11 males and 5 females; M = 13.31±1.922 years). Autism diagnosis was assigned based on the gold standard instruments: parental or caregiver interview, Autism Diagnostic Interview-Revised and direct semi-structured proband assessment with Autism Diagnostic Observation Schedule. Participants engaged in an active task of an avatar with two temporal trajectories: morphing from neutral to happy or sad expressions and unmorphing back to neutral. We recorded ERPs and MRS in autistic and non-autistic children/adolescents in these groups matched for sex, handedness, and age. GABA and Glx (Glutamate+Glutamine) measurements were performed with the Hadamard Encoding and Reconstruction of Mega-Edited Spectroscopy (HERMES) approach.

Results: We found that the dN170 had longer latencies during unmorphing for the autistic group: a main effect was found for the dynamic conditions, $F(1, 30) = 4.336, p < .05, \text{partial } \eta^2 = .126$, and the pairwise comparisons showed that, for the autistic group, there are longer latencies in the unmorphing condition ($M = 263.813, SE = 8.893$) than in the morphing condition ($M = 226.813, SE = 8.465$). The specific timing effect identified for the unmorphing vs morphing conditions in autism suggests a stimulus trajectory dependent effect (hysteresis in autism). dP300 results demonstrated higher amplitudes in the autistic group during morphing: a statistically significant two-way interaction between dynamic conditions and group was found, $F(1, 30) = 11.572, p < .01, \text{partial } \eta^2 = .278$. Pairwise comparisons showed that the dP300 amplitude elicited by the morph condition is higher in the autistic ($M = 5.860, SE = .469$) than in the non-autistic group ($M = 3.870, SE = .469$). This suggests the presence of an attentional compensatory mechanism. Correlations between ERPs, neurochemical (GABA), and social communication abilities provided evidence of a continuum from non-autistic to autistic phenotypes.

Conclusions: These findings support the promising roles of specific dynamic facial expression ERPs by reflecting perceptual and attentional processing differences in autism.

437.084 Normative Modelling of the Functional Connectome in Autism Spectrum Disorder

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Background: Altered social communication in autism (ASD) impacts many aspects of life including learning and relationships. Social communication difficulties in ASD may be linked to alterations in cognitive processes such as memory and reasoning, which show altered functional connectivity (FC) in the brain in ASD. While case-control studies are common, they are flawed in assuming homogeneity of groups. ASD is known to be a highly heterogeneous population and case-control methods may mask individual differences. Normative modeling provides a solution by deriving neurotypical (NT) developmental trajectories of selected features and computing individual-level deviations. This is often done using anatomical features, and studies have shown that the extent of deviation from anatomical norms can predict ASD symptoms. Recent studies have characterized FC, rather than anatomy, and demonstrated applicability in ASD. Complex and dynamic processes in the brain such as social communication and memory are better captured by FC than anatomy. Therefore, it stands to reason that deviations from the normative functional connectome in ASD would relate to the amount of impairment in these cognitive functions. Relationships between the extent of deviation and social communication processes could inform areas for early detection or intervention.

Objectives: **1.** Compute extent of deviation from normative FC in NT and ASD samples. We expect ASD children will have a greater proportion of extreme deviations. **2.** Relate deviation to behavioural measures such as memory, theory of mind, social responsiveness, and IQ. We anticipate deviation in the ASD group to be related to these measures.

Methods: We currently have a sample of 129 participants (103 NT, 26 ASD; aged 5.95-30.00 years) with 3T multi-echo fMRI including movie-watching rather than rest data as this has been shown to reduce movement in children and to provide higher sensitivity to behavioural differences. Additionally, we measure IQ (WISC-V), social responsiveness (SRS-2), memory, and theory of mind. Data collection is ongoing. **1.** We will derive normative models of system segregation ($(FC_{\text{within-network}} - FC_{\text{between-network}})/FC_{\text{within-network}}$) for each of the 7 and 17 Yeo networks using open-access HBN movie-watching fMRI data. We will compute age- and sex-specific deviation indices for each subject and identify extreme deviations in each group. **2.** We will correlate deviation indices with each behavioural measure.

Results: Models derived in our NT sample and applied to our ASD sample (e.g. Figure 1) show positive correlations between segregation of the control network and measures of fluid reasoning ($\rho = .424$, $p = .017$, Figure 2), and between segregation of the default mode network and social responsiveness ($\rho = .404$, $p = .024$). Modeling of HBN data and comparison between these deviations and behaviour is underway.

Conclusions: Our results suggest FC deviations from normative models can predict behavioural differences associated with social communication in ASD. This advances our understanding of the development of the functional connectome in ASD and may be applied to identify areas for intervention at an individual level. These data could be used to derive ASD subtypes and characterize multiple developmental trajectories within this population for early detection before behavioural symptoms are evident.



437.085 Real-World Listening in the Autistic Brain

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Background:

Histological studies conducted in postmortem human tissue samples from autistic children show dysmorphology and decreased neuronal numbers in auditory brainstem nuclei that are important for coding information from the two ears (binaural hearing). Difficulty on auditory tasks that rely on binaural hearing, such as understanding speech in noisy real-world environments, is also frequently reported by autistic individuals.

Objectives:

In this study, we obtained neural and behavioral measures of binaural hearing to test the hypothesis that deficits in binaural coding underlies the auditory processing difficulty experienced by autistic individuals.

Methods:

The participants in this study were 19 autistic 7-to-10-year-old children (13 male, 6 female) and 19 age- and biological sex-matched neurotypical comparison children. To assess binaural processing, we measured the neural encoding of timing differences between the ears using electroencephalography (EEG) as well as spatial release from masking (SRM), a binaural hearing phenomenon that improves speech perception when distracting talkers are spatially segregated from the talker of interest. To prioritize real-world relevance, we simulated an everyday classroom scenario for our speech perception measure: Listening to a teacher read a book in a sea of background noise. We recorded EEG while participants were listening to an audiobook under 3 conditions 1) Quiet, 2) Co-located Noise, and 3) Segregated Noise. To quantify how well speech is encoded in the neural response, we employed a linear modelling approach where a ridge regression model was fit from acoustic speech features including the envelope, envelope derivative, word onset, and phoneme onset, to the EEG signal to produce a multivariate temporal response function (mTRF). This mTRF method allowed us to compare the neural encoding of speech in noise across groups using machine learning, and to obtain a neural measure of SRM.

Results:

Our preliminary results show reduced neural encoding of timing difference between the ears in autistic children (Fig. 1). Furthermore, the mTRF analysis revealed the surprising finding that the neural encoding of speech is worse for autistic children when distracting talkers are moved away from the target speaker (Segregated Condition; Fig. 2). This is the opposite pattern expected. What this finding may translate to in a classroom, is that when students are listening to their teacher read at the front of the room and there are distracting talkers (e.g., other students), moving the distracting talkers away from the teacher and off to the side helps neurotypical children hear the teacher better. However, this makes autistic children do worse at hearing what the teacher is saying.

Conclusions:

These findings suggest binaural processing differences in autistic children, warranting further investigation in larger cohorts and across a wider age range.



437.086 Relationship between Early Visual Processing and Sensory Profiles in Young Autistic Children

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Background:

Visual Evoked Potentials (VEP) provide insights into early visual processing mechanisms, revealing significant differences in neural responses among autistic individuals. Research consistently demonstrates reduced amplitudes in VEP components, particularly P1 and N1, suggesting constraints on local processing pathways and enhanced sensitivity to specific visual stimuli. Additionally, longer N1 latencies have been associated with executive function challenges and sensory awareness. Although sensory processing challenges—hyperresponsivity (heightened reactions to sensory input), hyporesponsivity (reduced reactions to sensory input), and sensory seeking (active engagement in sensory experiences)—are prevalent in autistic individuals, the relationship between these profiles and early VEP responses remains poorly understood. This study aims to fill that gap by examining how variations in P1 and N1 components relate to sensory behaviors in young autistic children.

Objectives:

We aim to examine if amplitude and latency of the early sensory components, P1 and N1, can predict downstream sensory behaviors in the three sensory domains. This is the first study to correlate VEP and Sensory Experiences Questionnaire (SEQ) in a sample of young autistic children.

Methods:

91 autistic children participated; of these, 43 (47%) had valid VEP data. P1 amplitude was calculated as the most positive value between 80 and 160 ms and N1 amplitude was calculated as the most negative value between 40 ms and the P1 latency in a) occipital left hemisphere, b) occipital right hemisphere, and c) occipital midline. VEP data were considered invalid if a) less than 30 trials remained after artifact detection (simple voltage threshold $\pm 200\mu V$) and removal of un-attended trials ($n=12$), or more than 1/3 of channels were interpolated overall or more than 2 interpolated within a region ($n=15$). Sensory processing was assessed via caregiver report using the SEQ. Linear regression was utilized for the full autism sample, with no subgrouping, with age and IQ as covariates, using an alpha of 0.05.

Results:

The N1 latency processing at the midline predicted both hyper-responsive behaviors ($\beta=0.009$, $p=.02$) and sensory seeking behaviors ($\beta=0.01$, $p=.02$). Whereas the latency of the P1 component in the left hemisphere predicted hypo-responsive behaviors ($\beta=-0.01$, $p=.02$). P1 and N1 amplitudes did not predict sensory profiles ($p > .05$).

Conclusions:

We observed that longer N1 latency predicts more hyper-responsive and sensory-seeking behaviors, while shorter P1 latency predicts more hypo-responsive behaviors in autistic children. The N1 component indicates varying degrees of excitatory input to the primary visual cortex, and may be related excitatory and inhibitory (E/I) changes in autism. Our findings suggest that the timing of early visual responses is associated with different sensory profiles in children with ASD, supporting research linking E/I mechanisms to sensory processing. The timing of VEP components, rather than their strength, is associated with downstream sensory behaviors. Timing of neural responses rely on properly myelinated neurons, with distinct pathways converging with millisecond precision; even slight disruptions in timing can lead to large-scale network changes. Future studies should directly compare subgroups to each other to see if amplitude/latency differences exist between the different sensory groups.



437.087 Relationship between Speech Performance and Sensorimotor and Language Network Functional Connectivity in Autism Spectrum Disorder

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Background: Speech impairment is common in individuals with autism spectrum disorder (ASD) and can adversely impact social interaction and communication. Both sensorimotor brain networks and language networks may play a role in the heterogeneous presentation of speech production in ASD.

Objectives: To evaluate the relationship between speech performance and sensorimotor and language network functional connectivity (FC) in ASD. **Methods:** 82 subjects with ASD and 34 typically developing control (TDC) subjects were enrolled. Speech measures included age scaled scores for the Goldman-Fristoe Test of Articulation Sounds-in-words subtest (articulation), NEPSY-II Inhibition Naming Time (rapid naming), and Diachokinetic Period (DDK) for repetitions of “Puh-Tuh-Kuh” (speech motor function) administered according to Oral Speech Motor Screening Exam-3rd Edition procedures.

Resting-state functional MRI (rsfMRI) was collected using a 32-channel coil on a 3T GE MR750 scanner and analyzed with CONN using language network seeds (left/right inferior frontal gyrus (IFG) and superior temporal gyrus (STG)) and sensorimotor network seeds (left/right lateral and midline superior sensorimotor cortex (SM)). T-tests evaluated group differences in speech measures. Multivariable linear regression models (adjusted by age and sex) compared FC between groups and evaluated the relationship between speech performance and FC within ASD subjects (false discovery rate correction for multiple comparisons).

Results: There was no significant group difference in age or sex. TDC subjects scored significantly higher in speech articulation, rapid naming, and speech motor function (Table 1).

ASD subjects had stronger FC between sensorimotor regions and the thalamus ($p < 0.005$), caudate ($p < 0.001$), and cerebellum ($p < 0.005$) but weaker connectivity within the sensorimotor network (right and left SM, $p = 0.005$; superior and right SM, $p = 0.00001$; superior and left SM, $p = 0.006$) compared to TDC subjects (Figure 1a). No significant differences between groups were found in language networks.

Among individuals with ASD, better articulation was associated with stronger FC between the SM and anterior cingulate cortex (ACC) ($p = 0.0001$; Figure 1b). Better rapid naming was associated with stronger FC between left STG and left supramarginal gyrus/angular gyrus ($p = 0.046$), and between left IFG and right precuneus/angular gyrus ($p = 0.0009$; Figure 1c). Slower DDK performance correlated with stronger FC between right STG and ($p = 0.026$; Figure 1d).

Conclusions: Results indicated that sensorimotor and language network FC was associated with speech performance in individuals with ASD. We identified stronger FC in the sensorimotor-cerebellar-thalamocortical pathway but weaker FC within cortical sensorimotor regions in the ASD. Stronger FC in the ACC, important for sensorimotor integration and error detection, was associated with better speech articulation in the ASD group. Further, the mSFC (involved in motor planning) and the STG (involved in auditory processing) are integral for speech-motor control. We found that increased right hemisphere connectivity in these regions was associated with slower DDK performance, which suggests that atypical lateralization may be involved in slower DDK performance. Our measure of rapid naming incorporated demands for both rapid speech and semantic judgments. This was the only task with semantic demands, and it was the only one to demonstrate associations with FC in the language network, with better performance being associated with stronger connectivity in ASD.



437.088 Reliability of a Novel Spatial Filtering Algorithm in the Reconstruction of MEG Cortical Auditory Evoked Responses Under Conditions of Different Paradigm Lengths and in Relation to Clinical Correlates in Autistic and Typically Developing Youth
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Background:

Magnetoencephalographic (MEG) cortical auditory response delays have been associated with lower verbal abilities in individuals with autism spectrum disorder (ASD). Functioning in other domains that rely on auditory processing, such as verbal learning, may also be related to these delays. Participation in MEG research can be challenging, as repeated trials (long scan times) are necessary to acquire quality data.

Objectives:

To evaluate: (1) group differences in source reconstructed MEG cortical auditory response latency, (2) associations between response latency and verbal learning in ASD, and (3) whether a novel approach to MEG source reconstruction would allow for replication of results under simulated conditions of fewer trials.

Methods:

41 typically developing control (TDC) and 71 ASD participants aged 8-17.3 years were administered the California Verbal Learning Test-Children's Version

(CVLT-C) and a MEG auditory evoked field (AEF) task. The CVLT-C age-scaled total learning score was used to index verbal learning. MEG data were collected for 120 trials (2-second inter-stimulus-interval) of a 100ms 1000Hz tone burst presented binaurally at 77dB. Four MEG datasets were created from the first 80%, 60%, 40%, and 20% of the 120 trials to simulate shorter scan times. For each dataset, artifact-free trials were processed with the Champagne with baseline noise learning algorithm. AEFs were localized to auditory cortex and M50, M100, and M200 response latencies and normalized amplitudes were documented for each hemisphere of each participant for all 5 datasets. Repeated measure ANCOVA was used to examine differences between groups and within-participants across the results of the five datasets. Bivariate linear regression with bisquare weight function was conducted to compare latency and amplitude results of 100% trials dataset against each simulated dataset. Finally, hierarchical linear regressions were performed to examine associations between CVLT-C total learning score and auditory response latencies/amplitudes derived from each of the five datasets after controlling for age.

Results:

Significant between group differences were identified for bilateral M100 (LH:F(1, 58) = 4.788, $p=0.033$; RH:F(1,80)=4.25, $p=0.043$) and right hemisphere M50 (F(1,65)=6.483, $p=0.013$) response latencies with delayed responses in the ASD group. No significant differences were identified within subject across reduced trial simulations for either latencies or amplitudes; however, bivariate linear regression results suggested that only the 80% ($R^2>0.88$) and 60% trials datasets ($R^2>0.45$) could produce reliable latency results relative to the 100% trials dataset, and amplitude results of all simulated datasets were not reliable. Hierarchical linear regression analyses showed that, after controlling for age, CVLT-C total learning score was significantly associated with left hemisphere M100 ($t(48)=-2.55$, $p=0.014$) and M200 latencies ($t(47)=-3.188$, $p=0.003$) in the 100% trials dataset, and that these significant associations were sustained for the 80% trial dataset. With 60% of trials, only the left hemisphere M200 remained significantly associated with CVLT-C scores.

Conclusions:

Results indicated that auditory response delays were associated with verbal learning performance in ASD participants. Further, a novel source reconstruction algorithm produced reliable latencies with 20%-40% fewer trials, suggesting that this approach could be used in studies focused on cortical auditory response latency to make research participation more accessible to those who cannot tolerate longer scans.

437.089 Repetition Strengthens the N170 Response in Autistic and Neurotypical Children: Results from the Autism Biomarkers Consortium for Clinical Trials (ABC-CT)

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Background: Converging evidence suggests that repetition suppression, or reduced neural response to repeated stimuli, is diminished in autism. This finding has been observed across sensory modalities, experimental methods, and developmental stages. Reduced repetition suppression is associated with increased autistic traits. Despite well-evidenced face processing differences in autism and their relation to social-communicative function, no studies have specifically examined repetition suppression of the N170, a marker of early-stage face processing, in autistic children.

Objectives: To (1) compare N170 repetition effects for faces and houses in autistic and neurotypical (NT) children; and (2) examine relationships with autistic traits. We predicted NT but not autistic children would show reduced N170 amplitude across trials. We expected reduced N170 repetition suppression to correlate with greater social and sensory autistic features.

Methods: In the Autism Biomarkers Consortium for Clinical Trials (ABC-CT), 280 autistic and 119 NT children aged 6-11 passively viewed 72 upright neutral faces and 72 houses while electroencephalogram (EEG) was recorded. We measured peak amplitudes of the P100, reflecting attention allocation, and the N170. We used linear regression to evaluate the influence of repetition (first/last half of trials), stimulus category (faces/houses), and group (autistic/NT) on N170 amplitude. The analyses were repeated with the P100-N170 peak-to-peak difference as the dependent variable to rule out the possibility that between-condition differences in more general visual processing indexed by the P100 influenced the findings. Associations between N170 repetition effects and measures of social function and sensory differences were examined using Pearson correlations.

Results: There was a significant main effect of repetition [$F_{1,828.71}=27.7, p<.001$], with N170 amplitude increasing (enhancement) not decreasing (suppression) in the second half of trials compared to the first half. There was also a significant main effect of stimulus category [$F_{1,834.65}=271.5, p<.001$], such that N170 amplitude was greater for faces compared to houses. There were no group differences in N170 amplitude [$F_{1,300.03}=1.7, p=0.199$]. No interaction terms were significant, meaning that repetition enhancement did not differ between faces and houses [$F_{1,829.38}=0.025, p=0.875$] or autistic and NT children [$F_{1,828.71}=0.088, p=.767$]. Repetition enhancement was negatively correlated, albeit weakly, with scores on the Pervasive Developmental Disorder Behavior Inventory sensory subscale ($r=.18, p<.05$) and the Social Responsiveness Scale, Second Edition social cognition ($r=.18, p<.05$) and social motivation ($r=.16, p<.05$) subscales among autistic children.

Conclusions: Contrary to our hypothesis, both autistic and NT children demonstrated repetition enhancement—an increase in N170 amplitude over the course of the experiment—rather than the expected suppression. Repetition enhancement is thought to reflect a temporary increase in encoding efforts related to the formation of novel neural representations, with repetition suppression emerging only after a stable representation has been established. Accordingly, there may have been insufficient trials in this study to induce repetition suppression. Alternatively, early-stage face processing, indexed by the N170, may not exhibit the same differential repetition effects observed with other stimuli or neuroimaging techniques. These findings suggest that reduced repetition suppression in autism may not be as robust as previously thought and may depend on the specific component or processing stage being measured.

437.090 Response of Resting State Networks to Cannabidiol (CBDV) in Autistic and Non-Autistic Individuals: From Both Static and Dynamic Perspectives

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Background: Resting state networks (RSNs) represent large-scale spatial patterns of neural functional connectivity. Altered RSNs are associated with cognitive and emotional difficulties, but - though widely reported in autism - very large cohorts are needed to identify even small reproducible differences. However, in these prior studies, RSN characteristics are averaged through time, possibly missing crucial information embedded in temporal fluctuations. Moreover, RSNs are regulated by neurochemical systems, yet this is under-explored in non-autistic, let alone autistic cohorts. We have previously shown that modulating the endocannabinoid system using CBDV shifts the functional connectivity of cortico-subcortical networks in autistic adults towards the pattern observed in non-autistic controls (Pretzsch et al., 2021).

Objectives: Here extended this work to examine static and dynamic data-driven RSN activity and tested the hypothesis that CBDV influences RSNs differentially in autistic and non-autistic adults.

Methods: A resting-state fMRI dataset from a randomised, double-blind, cross-over study of autistic (n=14) and non-autistic (n=17) males, was acquired following placebo or 600mg CBDV administered orally on 2 separate visits. We identified 20 RSNs with group-level independent component analysis. The static RSN activity was characterised as core network strengths - mean values across voxels of subject-specific spatial maps (dual regression stage 2). The dynamic RSN activity, was characterised using the moment-to-moment RSN activity timeseries (dual regression stage 1). All timepoints were clustered into 10 brain states with K-medoid (Figure 1). Dynamic features were computed as fractional occupancy (FO) and dwelling time (DT) of each state. Baseline differences (placebo condition), drug effects of CBDV, group×drug interaction and differences between autistic RSNs under CBDV and non-autistic baseline were examined with multiple linear regression and linear mixed models.

Results:

Static RSNs: At baseline, the core network strength of the executive control network (ECN) was higher in autistic participants than in non-autistic participants ($t=2.446$, $p=.022$). There were no main effects of CBDV nor group×drug interaction, though group differences were not present between autistic participants under CBDV and non-autistic baseline.

Dynamic RSNs: At baseline, the FO and DT of State 10 were higher in autistic adults compared to non-autistic controls (FO: $t=3.030$, $p=.005$. DT: $t=3.099$, $p=.005$). There was a significant effect of CBDV on the DT of State 6 ($\chi^2(1, 23)=5.286$, $p=.021$) and State 10 ($\chi^2(1, 23)=12.381$, $p<.001$) in non-autistic participants as well as significant group×drug interaction effects on the DT of State 6 ($\chi^2(1, 43)=6.617$, $p=.010$) and State 10 ($\chi^2(1, 43)=6.437$, $p=.011$). CBDV significantly increased the DT of State 6 ($t=2.299$, $p=.039$) (Figure 2A) and State 10 ($t=3.519$, $p=.004$) (Figure 2B) in non-autistic participants. While there was no significant drug effect in autistic participants, differences in the FO and DT of State 10 were not found between autistic participants under CBDV and non-autistic baseline (Figure 2B).

Conclusions: We have shown baseline differences in both static and dynamic RSN activity between autistic and non-autistic individuals. Moreover, CBDV modulated the RSN dynamics differently in autistic and non-autistic adults, suggesting a shift in autistic brain dynamics towards a pattern more similar to non-autistic baseline after CBDV.



437.091 Resting EEG Periodic and Aperiodic Components and Links to Language and Cognitive Skills in Neurotypical and Autistic Children

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Background: Previous studies have shown that resting-state EEG power across multiple frequency bands is associated with language development in young autistic children, although this finding has not consistently been replicated. Most prior studies focused on absolute or relative power when examining brain-behavior association with language development. New methods have emerged to parametrize the power spectra into *aperiodic* (broad band neuronal spiking activity) and *periodic* (oscillatory activity across different frequency bands) components. However, little is known about whether aperiodic or periodic components differ between neurotypical and autistic children and how these neural activities relate to language and cognitive abilities in autistic children with a wide range of language skills.

Objectives: Aim 1: To characterize and compare whole brain resting aperiodic and periodic components between neurotypical and autistic children. Aim 2: To investigate the concurrent association between resting aperiodic and periodic activities, receptive and expressive language skills, and cognitive ability in autistic children.

Methods: Artifact-free 5-minute resting-state EEG data from 71 neurotypical and 63 autistic children (age-matched; $M_{age}=4.44$ years, $SD=1.20$, ranging from 2.04 to 6.85) were included in this study. Aperiodic and periodic activity were decomposed using SpecParam. All autistic participants have a confirmed clinical diagnosis of autism spectrum disorder. Natural language samples were used to derive two measures of expressive language: number of different words (NDW) and mean length of utterance (MLU). Receptive language was assessed using the Preschool Language Scale-Fifth Edition (PLS-5) and nonverbal IQ with the Mullen Scales of Early Learning or the Differential Ability Scales-II. ANCOVAs were used to compare resting neural activity between neurotypical and autistic children with age as a covariate. Linear regression models were used to examine the association between EEG features and language and cognitive ability in the autistic group.

Results: Aperiodic offset decreased with age across the sample, $r(134)=-.181$, $p=.036$. After controlling for age, aperiodic offset was larger in the autistic group, $F(1,131)=6.63$, $p=.011$. There were no significant differences in aperiodic slope between the two groups. Autistic children showed significantly higher aperiodic total power than their neurotypical peers, $F(1,131)=4.56$, $p=.035$. While neurotypical and autistic children did not show significant differences in peak alpha amplitude and frequency, older children demonstrated higher peak alpha amplitude, $\rho(134)=.18$, $p=.037$, and frequency, $\rho(134)=.303$, $p<.001$, in both groups.

Autistic children with higher peak alpha amplitude used more diverse vocabularies (NDW, $F(3,64)=7.69$, $p<.001$) and complex sentences (MLU, $F(3,62)=8.55$, $p<.001$) during naturalistic interactions controlling for age and had higher nonverbal IQ, $r(60)=.275$, $p=.034$. Autistic children with lower aperiodic offset ($F(2,58)=3.522$, $p=.036$) and higher peak alpha amplitude ($F(2,58)=4.78$, $p=.012$) had higher receptive language.

Conclusions: Autistic children demonstrated more broad band neural spiking activity compared to their neurotypical peers reflected by a larger aperiodic offset, and those with reduced spiking activity showed better receptive language. Neurotypical and autistic children did not show significantly distinct patterns of excitatory-inhibitory balance based on the similar aperiodic slope between the two groups. Peak alpha amplitude, an indicator of thalamocortical maturation, is important for nonverbal IQ and language development in autistic children.



437.092 Resting Gamma Power Associates with Expressive Language Skills in Autistic Youth

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Background: There is substantial heterogeneity in language skills among children with autism spectrum disorder (ASD). High-frequency EEG oscillations between 30–45 Hz (i.e., gamma) are associated with language ability and higher-order cognition. Gamma oscillations display a pattern of developmental maturation, increasing rapidly during early life to promote cognitive development, slowing in adolescence, and decreasing in advanced age in neurotypical (NT) individuals. Reduced frontal gamma power correlates with expressive language skills and language learning in autistic children. However, whether gamma is elevated or reduced in autism is debated, and its developmental trajectory in autistic children is unclear.

Objectives: This study aimed to examine the relationship between development, expressive language abilities, and gamma power during resting EEG in autistic and non-autistic children.

Methods: Resting EEG data was collected from 25 autistic (6–18 years; $M=11.3$, $SD=3.7$) and 41 non-autistic (6–18 years; $M=11.2$, $SD=3.3$) children. Participants in both groups had an $IQ \geq 70$ ($M=113.8$, $SD=15.1$), and groups did not differ on IQ or age. EEG was recorded while participants sat still with eyes open and closed. A one-way ANOVA measured whether gamma power, averaged across all electrodes, differed between groups. For autistic participants, Pearson correlations examined the relationship between gamma power and expressive language skills, measured by the Vineland Adaptive Behavior Scales-3, a parent interview of adaptive functioning.

Results: Gamma power over all electrodes decreased with age in both groups (ASD: $r=-0.27$, $p=0.2$, NT: $r=-0.24$, $p=0.36$). Autistic youth had elevated gamma compared to NT participants ($F(1,39)=3.493$, $p=0.07$, $\eta^2=0.08$). No correlation between gamma and expressive language was found in the NT group. However, in the ASD group, gamma power positively correlated with expressive language skills on the Vineland ($r=0.49$, $p=0.01$).

Conclusions: Consistent with extant findings among neurotypical populations, gamma power decreased with age for autistic and non-autistic participants alike. However, autistic children had elevated gamma power overall compared to the non-autistic group, possibly reflecting differences related to attention, perception, or learning. Contrary to prior research, gamma power was positively associated with expressive language skills in the autistic group which may indicate more effective neural connectivity within language-related networks in the brain. Because our sample ranged from age 6 to 18, the results may demonstrate developmental differences related to gamma power and autism, wherein the rapid increase in gamma power observed in non-autistic children during early life continues into adolescence for autistic children. Future studies with larger samples and constrained developmental ranges may further clarify the relationship between gamma power, development, and language abilities in autism.



437.093 Sex-Specific Cerebrovascular Reactivity Differences in Autistic Children

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Background: Many studies use resting-state functional magnetic resonance imaging (rsfMRI) to investigate the neurobiology of autism; however, findings remain inconsistent and are often attributed to the heterogeneity of neural differences in autism. Yet, in addition to neural activity, the blood oxygen level dependent (BOLD) signal also reflects systemic vascular changes that drive oxygenated blood flow, such as local brain vascular capacity. Despite evidence of cerebrovascular differences in preclinical and postmortem studies of autism, these findings and the extent to which heterogeneity in cerebrovascular differences may contribute to disparate rsfMRI findings have not been examined in humans in vivo. In a previous study, we leveraged a novel rsfMRI analysis to measure cerebrovascular reactivity (CVR), or the capacity for cerebral blood vessels to dilate in response to a vasoactive stimulus, in the multi-site Autism Brain Imaging Data Exchange. For the first time, we identified elevated relative CVR (rCVR) in regions of the ventral attention network, specifically in autistic girls (9-12 years old).

Objectives: In this study, we leverage a longitudinal, single-site study of autistic and non-autistic children, to investigate rCVR differences in a new cohort.

Methods: RsfMRI images (TR=2s) were motion corrected and spatially smoothed (Gaussian kernel full-width-half-max=8mm). Motion parameters, a linear drift term, and imaging frames with framewise displacement (FD) greater than 0.25mm were removed using linear regression. After excluding participants with fewer than 75% of frames censored for motion, 56 autistic (16 female) and 67 non-autistic (26 female) participants (9-12 years old) were included. CVR is calculated as the change in BOLD signal per change in vasoactive stimulus (e.g. CO₂). To generate rCVR maps from rsfMRI, we used voxel-wise general linear models that regress each voxel's BOLD signal on the frequency-filtered (0.02-0.04Hz) global signal, which reflects natural changes in arterial CO₂, a vasodilator, during normal breathing (Figure 1). Resulting β maps from linear regression were normalized to global β to produce rCVR maps. CVR was calculated in native fMRI space, then transformed to T1-anatomical and MNI-standard space. Using linear models, rCVR was compared between diagnostic and sex groups in gray matter regions of the Harvard Oxford Atlas (91 regions). Nuisance regressors included age and mean FD.

Results: Autistic females had decreased rCVR in the right middle frontal gyrus (rMFG; $\beta=-0.31$, $p=0.0004$) and posterior cingulate cortex (PCC; $\beta=-0.15$, $p=0.03$) compared to non-autistic females (Figure 2). No diagnostic effects were significant in males. There was a significant diagnosis-by-sex interaction in the rMFG ($p=0.008$), where autistic females also had decreased rCVR compared to autistic males ($\beta=-0.24$, $p=0.003$). In the PCC, non-autistic females had elevated rCVR compared to non-autistic males ($\beta=0.12$, $p=0.03$).

Conclusions: In our second study of rCVR differences in autistic children, we identified rCVR differences in similar regions, specifically in autistic females. However, in this study, we found decreased, as opposed to elevated, rCVR in autistic females. Our sex-specific findings are consistent with known sex hormone mediated differences in cerebrovascular function. Further studies will examine these differences longitudinally and in relation to pubertal status, behavior, and functional connectivity to disentangle these findings.



437.094 Sleep Spindles and 40Hz Auditory Steady State Responses As Biomarkers of Thalamocortical Circuit Dysfunction in Autism Spectrum Disorder

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Background: Accumulating evidence implicates thalamocortical circuit dysfunction in autism spectrum disorder (ASD). Thalamocortical circuitry plays an important role in filtering information from the environment. Thus, disruptions in this circuitry could be related to core symptoms (i.e., sensory sensitivities) and sleep disturbances, which are common in ASD. One assay of thalamocortical circuit functioning are sleep spindles, 12-15Hz bursts of activity generated by the thalamic reticular nucleus and propagated to the cortex by thalamocortical relays. During wake, the same circuitry modulates gamma oscillations in auditory cortex, which can be indexed by the 40Hz Auditory Steady-State Response (ASSR). Reduced 40Hz ASSRs and sleep spindles are reported in people with ASD, supporting the possibility of thalamocortical circuit dysfunction. However, it remains unclear if there is a relationship between these measures in ASD, or if they are associated with clinical features of ASD.

Objectives: Here, we test the hypothesis of thalamocortical circuit dysfunction in ASD, and that this circuitry underlies sleep disturbances or core ASD symptoms. We predict that there would be reduced 40Hz ASSRs and spindle density in ASD, and that reductions in spindle density would be correlated with reductions in the 40Hz ASSR given that they arise from common circuitry. We also predict that reductions in 40Hz ASSRs and spindle density will be related to increased ASD symptom severity and sleep disturbances.

Methods: 18 adults with ASD (age: 22±3; 3 Female; Non-verbal IQ: 108±14) and 16 neurotypical (NT) adults (age: 24±4; 4 Female; Non-verbal IQ: 112±16) were given a 90-minute nap opportunity while EEG was recorded. Following the nap, participants listened to 150 40Hz click trains (500ms on, 500ms off) while EEG was recorded to measure ASSRs. ASD symptom severity was assessed using the Autism Diagnostic Observation Schedule (ADOS). We derived sleep spindle density (#/minute) and wake after sleep onset (WASO) from the nap data, and calculated inter-trial phase coherence (ITPC), a measure of phase alignment, from the ASSR task.

Results: ASD participants had reduced 40Hz ASSRs compared to NT participants ($t(25)=2.67$, $p=.01$, $d=1.03$). There were no significant differences in spindle density between groups. Reduced 40Hz ASSRs were associated with lower spindle density in frontal electrodes ($ps<.042$). Although the magnitude of this relationship did not significantly differ between groups, it was mostly driven by NT participants ($r=.71$, $p=.01$; ASD $r=.10$, $p=.76$). Within the ASD group, lower 40Hz ASSRs correlated with higher ADOS scores ($r=-.74$, $p=.002$). Worse sleep quality (increased WASO) was also associated with reduced spindle density in NT and ASD participants ($Tsum=-16.08$, $p<.001$).

Conclusions: These results provide mixed support for the hypothesis of thalamocortical circuit dysfunction in ASD. Spindles and 40Hz ASSRs were correlated in NT participants, consistent with the notion that these biomarkers arise from common circuitry, but this relationship was weaker in ASD. These biomarkers were also associated with sleep disturbances and core ASD symptom severity, highlighting their clinical relevance. Additional work is required to better understand the role of thalamocortical circuitry in ASD and replicate these findings in a larger sample.

437.096 Specific Association Patterns between Brain Glutathione Levels, Myelin Map and Functional Connectivity in Autism Spectrum Disorder

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Background: Previous studies have demonstrated reduced levels of glutathione (GSH), which is involved in the body's antioxidant defenses, in blood samples from individuals with autism spectrum disorder (ASD) (Frustaci et al. 2012; Chen et al., 2021). Although several postmortem brain studies in ASD have reported reduced GSH levels in the temporal cortex and the cerebellum (Chauhan et al., 2012; Rose et al., 2012), there has been no in vivo evidence of atypical brain GSH levels in individuals with ASD.

Objectives: This study examined whether 1) individuals with ASD have reduced GSH levels in regions suggested by postmortem brain studies, including the temporal lobe and cerebellum, 2) brain GSH levels show differential associations with myelination in autistic and typically developing (TD) individuals, 3) relationships between myelination and functional connectivity also differ in ASD and TD individuals, and 4) functional connectivity shows group differences in associations with emotion recognition ability.

Methods: In this study, regions of interest (ROIs) were defined in the bilateral temporoparietal junction (TPJ), cerebellum, and pregenual anterior cingulate cortex (pgACC), and GSH measurements were performed using ¹H-magnetic resonance spectroscopy (MRS) to compare individuals with ASD (n=30, age range 20-39, 28 males) and age- and sex-matched TD (n=27, age range 18-41, 25 males). Myelin maps were generated based on the T1w/T2w ratio to explore myelin associations with GSH across the whole brain. Functional connectivity analyses were performed based on resting-state functional magnetic resonance imaging (rsfMRI). We used the multivariate pattern analysis (MVPA) to examine group differences in associations between T1w/T2w ratio and functional connectivity. Based on the MVPA results, we also examined group differences in associations between functional connectivity and emotion recognition ability as measured by the Reading the Mind in the Eyes Test (RMET, Baron-Cohen et al., 2001).

Results: Individuals with ASD showed higher left TPJ GSH concentration than TD controls ($t = 2.1$, $p < 0.05$, uncorrected). No significant differences between groups were found in other ROIs. Myelin maps showed a significant group x GSH interaction in the left middle frontal gyrus (MFG), suggesting a group difference in the correlation between the left TPJ GSH concentration and the left MFG T1w/T2w ratio ($p < 0.05$, family-wise error [FWE] corrected at the cluster level). MVPA also identified a significant cluster in the left MFG for the interaction between group and the left MFG T1w/T2w ratio, suggesting a group difference in the association between the left MFG myelination and functional connectivity from this area. Finally, using this left MFG cluster as a seed region, a whole-brain seed-to-voxel analysis revealed that the correlation between MFG-occipital functional connectivity and emotion recognition ability was significantly different between groups.

Conclusions: The present study demonstrated ASD-specific associations between GSH levels, myelination, functional connectivity, and emotion recognition ability. Contrary to the hypothesis, brain GSH levels were not reduced but increased in the left TPJ of individuals with ASD, and GSH levels in this region were positively associated with myelination in an ASD-specific manner. These findings suggest compensatory neural mechanisms in individuals with ASD.

**437.097** Spontaneous Functional Connectivity in Subcortical Attentional Networks Driving Social Behaviors and Developmental Outcomes in Autism

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Background:

Evidence from human and basic research suggests that the central issue of atypical social orienting in autism may involve dysfunction in early-maturing brain structures designed for detecting relevant environmental elements (Kleinhan et al., 2011). This ancient attention pathway, compared to neocortical-subtended attention, is responsible for the automatic detection of salient stimuli in the environment (Johnson et al., 2005) and is phylogenetically conserved across species to facilitate rapid detection of relevant signals, such as threats or conspecific cues. This route involves the superior colliculus (SC), pulvinar (PUL), and amygdala (AMY), with the SC being central. Research shows that the SC matures early, around 20 weeks gestation (Qu et al., 2006), predisposing it to salience detection early in development. This aligns with findings of early preferential orienting to faces (Simion et al., 2011) or face-like stimuli (Goren et al., 1975, Johnson et al., 1991) in human infants. In parallel, recent translational evidence from autism mouse models (SHANK3) showed that the SC-Ventral Tegmental Area (VTA) pathway, a dense site of dopaminergic (DA) neurons, was critical to encoding social orientation towards an unfamiliar conspecific (Solié et al., 2022). Converging evidence of this circuit's role in processing social information comes from a study in children with autism (7-13 years old) highlighting aberrant structural and functional connections between the VTA and nucleus accumbens (NAc) in response to social stimuli (Supekar et al., 2018). Objectives: To investigate the role of the subcortical attention route, involving the superior colliculus (SC) and its connections, in the symptomatology of autism spectrum disorder (ASD) and assess how connectivity patterns within this pathway relate to key autistic symptoms and developmental progress.

Methods:

We utilized the superior colliculus (SC) as a seed region to explore its whole-brain functional connectivity in relation to age and autistic symptom severity using partial least squares correlation (PLS-C). This approach revealed a significant multivariate component ($r = 0.64$, $p = 0.04$), indicating a primary effect of symptom severity and a secondary effect of age. To evaluate developmental changes, follow-up data from 30 children were analyzed using a "rate of change" score derived from differences between follow-up and baseline Mullen Scales of Early Learning (MSEL) results, normalized by the elapsed time.

Results: The significant PLS-C component indicated lower SC connectivity with regions involved in reward processing and attention, including the ventral tegmental area (VTA), pulvinar, amygdala, visual cortex, precuneus, vermis, and temporoparietal junction. Children with higher symptom severity exhibited hypoconnectivity within this network. Notably, SC-VTA connectivity showed a positive correlation with developmental change rates, particularly in a subgroup of children receiving early intensive behavioral intervention.

Conclusions: This study provides evidence that SC-VTA connectivity may play a crucial role in developmental gains among children with ASD, highlighting its potential as a biomarker for stratifying developmental outcomes. The findings suggest that early intervention strategies might capitalize on the plasticity of this pathway to enhance multisensory integration and developmental progress. Future studies with larger cohorts are needed to confirm the role of SC-VTA connectivity in guiding personalized interventions in ASD.

437.098 Stay Still like a Statue: Using a Brief Measure to Predict Head Motion during MEG Data Collection

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Background: There has been increasing awareness of the need for the inclusion of individuals with Autism Spectrum Disorder (ASD) who have high support needs in neuroimaging research. To this end, clinical and behavioral protocols for reducing motion and increasing scan quality have been developed (e.g., Nordahl et al., 2016; Kushner et al., 2021). These protocols may also benefit autistic children with fewer support needs, but who may still demonstrate increased head motion due to repetitive behaviors, sensory sensitivity, or executive functioning difficulties, leading to a reduction in evaluable data (Bednarz & Kana, 2018). As motion training can be time-intensive, establishing methods to efficiently identify individuals who may benefit most from this training is of interest.

Objectives: To assess the use of a brief assessment (NEPSY-II Statue) for screening participants to predict head motion during magnetoencephalography (MEG) data collection.

Methods: Participants were 61 children with ASD, 6 to 12 years (54 males, mean age=9.8 years, SD=1.4; mean IQ=106.5, SD=17.7). The NEPSY-II Statue subtest was administered to participants, and caregivers completed the Child Behavior Checklist (CBCL) and the Behavior Rating Inventory of Executive Function (BRIEF). The Statue task requires children to maintain a pose with their eyes closed for 75 seconds while the examiner introduces distractions. Norms are not available for school-age children, as they are expected to achieve a perfect raw score (indicating no movement during the task; Korkman et al., 2007); thus, raw scores were used for analysis. Participants were scanned using a 275-channel CTF MEG system in a supine position with three head position indicator (HPI) coils attached to the scalp to monitor head position during a 15-minute task where they are presented auditory stimuli while watching a movie (without sound).

Results: There was a relationship between the mean raw score on Statue and the maximum amount of motion ($M=2.01$ mm, $SD=1.6$, $r=-0.27$, $p=.03$). The amount of time with motion >10mm during the MEG exam was also associated with the number of 5-second intervals during which the child opened their eyes ($r=0.27$, $p=.04$) or vocalized ($r=0.26$, $p=.05$) during Statue, but not the total raw score or intervals with body movement. There were no significant associations between the amount or duration of motion during the MEG exam and caregiver ratings on the CBCL or BRIEF ($ps>0.05$). Finally, there were no associations between motion and age ($r=-0.02$, $p=.86$) or IQ ($r=-0.13$, $p=.32$).

Conclusions: Children who had more difficulty keeping their eyes closed or staying quiet during the 75-second task had more head motion during MEG data collection. There were no associations between caregiver rating scales and motion; therefore, Statue may be an efficient and better predictor of motion during the MEG exam compared to more comprehensive measures, such as caregiver rating scales. Furthermore, motion was not predicted by age or IQ. Thus, Statue is a quick and easy-to-administer approach to identifying children who may benefit from motion training prior to neuroimaging, making it an ideal tool to integrate into neuroimaging protocols.

437.099 Subcortical Brain Volumetric Differences in Autistic Individuals across the Lifespan

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Background: Several subcortical brain regions underpin critical clinical symptomatology of autism spectrum disorder (ASD), including hippocampus, amygdala, thalamo-basal ganglia, and ventricular areas. However, the extent to which volumetric variations of these subcortical regions differ between autistic individuals and neurotypical controls across the lifespan, particularly during middle to later adulthood, is largely unknown.

Objectives: To bridge this critical gap, we leveraged a multi-site T1-weighted MRI dataset to examine volumetric deviations in the hippocampus, amygdala, thalamo-basal ganglia, and ventricles in autistic individuals and controls ages 7-73 years. We examined between-group differences in each subcortical region for the whole age range and Young (<30 years) and Old (≥30 years) subgroups, respectively.

Methods: Our dataset includes 122 autistic (40 female) and 92 neurotypical controls (37 female) recruited from the UT Southwestern Medical Center, University of Kansas, and University of Florida. All T1 data underwent standard postprocessing pipelines using FreeSurfer 7.2.0. Volume data of 38 hippocampal, 18 amygdala, 8 thalamo-basal ganglia, and 8 ventricular ROIs were extracted. Subfields associated with a specific subcortical region were bundled for principal component analysis (PCA). For each subcortical region, component(s) were selected when the cumulative variance exceeded 75% total variance. ANCOVA(s) were then implemented on each selected component with Group, Age, and Group *Age as predictors, total intracranial volume and sex as covariates, and the component score as the response. ANCOVA analyses were examined for the whole sample and then separately for Young and Old subgroups.

Results: The first principal component (PC1) was extracted for the ventricle and amygdala cluster. Additional PCs were extracted for the thalamo-basal ganglia and hippocampal clusters, respectively. The bilateral ventricles contributed significantly to PC1 of the ventricular cluster. For the whole and Old age analyses, autistic individuals showed greater PC1 scores compared to controls of older ages. For the amygdala cluster, PC1 primarily consisted of the bilateral lateral nucleus and basal nucleus. Autistic adults exhibited greater PC1 scores than controls when comparing the whole sample and the Young subgroup. For the hippocampal cluster, PC1 was largely associated with bilateral hippocampal head, body, and tail subfields. Young autistic individuals showed greater PC1 scores compared to young controls. For the thalamo-basal ganglia cluster, PC1 was primarily driven by the bilateral thalamus. The autistic Young group demonstrated significantly greater PC1 scores, but this was not exhibited for the whole or Older group. No significant group or group-by-age effect was identified for the remaining PCs of the hippocampal and thalamo-basal ganglia clusters.

Conclusions: Our findings highlighted accelerated ventricular volumetric increases in autistic individuals at old ages. The "Old" autistic group did not differ from controls in volumes of the hippocampal, amygdala, and thalamo-basal ganglia clusters, although this observation was associated with significant overgrowth of these subcortical regions in young autistic individuals and a faster rate of volumetric declines in ASD with older age. Together, our study offers novel insights into neurobiological substrates underlying age related volumetric differences in ASD and highlights potential earlier and accelerated neurodegenerative processes manifested in subcortical regions at young ages of ASD.

437.100 Symptoms of Persistent Depression but Not General Anxiety or Major Depression Predict Resting Alpha Power for Autistic Children: Results from the Autism Biomarkers Consortium for Clinical Trials (ABC-CT)

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Background: Autistic individuals exhibit different patterns of EEG power spectra (elevations in resting gamma power, reductions in relative alpha power) compared to neurotypical individuals, representing possible biomarkers for autism (Neo et al., 2023). Distinct power spectra have also been observed in Major Depressive Disorder (MDD; increased theta power and increased alpha power; Kemp et al., 2010) and Anxiety Disorder (decreased theta power; Zhang et al., 2022). Anxiety and depression frequently co-occur in autism, thus understanding relationships among anxiety and depression and resting EEG in ASD could inform biomarker development (Mayes et al., 2010).

Objectives: The current study aimed to (1) examine how resting state EEG power varies as a function of parent-reported anxiety and depressive symptoms in autistic participants and (2) investigate possible differential relationships in autistic versus neurotypical children.

Methods: Resting EEG was collected from 260 children with ASD (31% female) and 116 neurotypical children (31% female) between the ages of 6 and 11 ($M_{age}=9.1\pm1.6$ years) in the Autism Biomarkers Consortium for Clinical Trials (ABC-CT). Log-scaled power spectral density EEG values were used as dependent variables in linear regression models that included variables to control for age, sex, full-scale IQ (Developmental Ability Scales II) and EEG data quality. Subscales from the Child and Adolescent Symptom Inventory, 5th edition (CASI-5) captured individual differences associated with symptoms of major depression (MD), persistent depression (PD), and general anxiety (GA).

Results: Regression models revealed a significant interaction between PD scores and diagnostic group to predict alpha power (10-12.99 Hz), indicating that the relationship between PD scores and alpha power differed between diagnostic groups ($\beta=0.28, p=.022$). Follow-up models within each diagnostic group revealed a main effect of PD score on alpha power for autistic participants ($\beta=-0.71, p=.049$), such that higher PD symptom report was associated with lower resting alpha power. A significant main effect of PD score in neurotypical participants indicated higher PD symptom count was associated with greater alpha power ($\beta=0.20, p=.048$). MD and GA scores exhibited no significant interactions with resting alpha power.

A significant interaction between MD scores and diagnostic group in the analysis of gamma (35-54.99 Hz) revealed that the relationship between MD scores and resting gamma power was also contingent on diagnostic status ($\beta=0.12, p=.023$). However, there was no significant main effect of MD scores on gamma power for autistic children. GA and PD scores exhibited no significant interactions with gamma power. All comparable analyses investigating theta band activity produced null results.

Conclusions: The relationships between resting alpha and gamma power and symptoms of anxiety and depression differed for diagnostic groups, confirming the between-group dissimilarity reported in prior work. Higher parent-reported PD symptomology was negatively associated with resting alpha power for autistic children, while this relationship was positive for neurotypical children. Contrary to previous literature, GA and MD symptoms were unrelated to resting state alpha or theta power for autistic participants. Results highlight the importance of considering co-occurring conditions when evaluating EEG biomarkers for autism.

437.101 Thalamocortical Gradients Reveal Atypical Thalamic-Insula Interactions in Autism

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Background: The thalamic-cortical circuits are critical in sensory information processing and cognitive integration. Findings from our recent work over typical development, suggest that connectivity between the thalamus and the salience network is pivotal in development of the functional segregation between externally-oriented (i.e., visual, sensorimotor) and internally-oriented (i.e., default mode) networks (Park et al., 2024, Nat Neuro). As a first step to extend this line of investigation to autism, the present study examines thalamocortical connectivity in this group along with its association with autistic symptom severity.

Objectives: We aimed to examine thalamocortical functional connectivity gradient maps (CMAP) and their neocortical projections (NEOMAP) in individuals in the autism spectrum compared to an age- and sex-matched neurotypical (NT) group.

Methods: We analyzed data selected from the Autism Brain Imaging Data Exchange-I (ABIDE-I), including n=107 autistic and 113 NT individuals, (aged 6.4–50 years, all males). We derived CMAPs in the Brainspace toolbox via diffusion map embedding with a normalized angle kernel, and applied Procrustes alignment for aligning individual CMAPs to the whole sample mean. NEOMAPs were extracted by multiplying CMAPs to the thalamus-cortex correlation matrix, projecting the CMAPs onto the neocortical surface. Statistical testing of CMAPs and NEOMAPs for group differences used surface-based linear models in SurfStat, with age and head motion as covariates; site effects were controlled via ComBat harmonization. For interpretation, we sorted the NEOMAPs and significant findings by the Yeo-Krienen 7 networks. Follow-up analyses using linear regression modeling tested for associations between gradients in the NEOMAPs regions showing significant group differences and the calibrated severity total scores of the Autism Diagnostic Observation Schedule-2.

Results: For both groups, CMAP1 showed a superior-to-inferior pattern while CMAP2 ranged from anterior-to-posterior. However, significant group differences were found in CMAP1 (pFDR-corrected<0.05, Figure 1A, 1B), particularly in thalamic nuclei involved in visual (pulvinar), somatosensory (ventral lateral posterior nucleus), and auditory (medial geniculate nucleus) processing, as well as in 'gate control' of salient features (centromedian nucleus). No significant differences were observed in CMAP2 (Figure 1C). Analysis of NEOMAP1 (i.e., the neocortical projection of CMAP1), revealed a more compressed cortical gradient (i.e., reduced range) in autism (Figure 2A, 2B). This was evident in the right insula, superior temporal, and visual cortex (pRFT-clusterwise<0.05; Figure 2C). Network profiling indicated these differences were most pronounced in the visual, somatosensory, salience, and default mode networks (Figure 2D). Notably, among the regions showing significant group differences (autism<NT), the right insula, within the salience and somatomotor networks, showed a significant negative correlation with autism symptom severity (p<0.01 for vertex-wise threshold, pRFT-clusterwise<0.05 for significance); Figure 2E).

Conclusions: The present findings show that atypical thalamocortical connectivity involving part of the salience network may contribute to autism symptom severity. Given the role of thalamo-salience connectivity in differentiating externally- and internally-oriented networks, these findings suggest atypical segregation of these networks in autism.



437.102 The Developmental Trajectory of Autism from Preschool to Adulthood: Age-Dependent Shifts in Thalamic Glutamate-GABA Ratios

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Background:

The excitation/inhibition (E/I) balance theory of autism proposes atypicalities in the balance between the activity of gamma aminobutyric acid (GABA) and glutamate, the brain's primary inhibitory and excitatory neurotransmitters, respectively. This shift in the activity state of neural systems may lead to differences in perception, cognition, and sensory function. Numerous lines of evidence - including genetics, preclinical research, and human investigations - support this theory. Magnetic Resonance Spectroscopy (MRS), a non-invasive MR technique, can be utilised to quantify the concentrations of GABA and glutamate in the human brain in vivo. While MRS has identified group differences in GABA and glutamate levels between autism and typical development (TD), this has predominantly been studied in adolescents and adults. Furthermore, the age trajectory of glutamate/GABA balance and its variations in autism remains largely unexplored, as well as sex differences. Gaining insight into E/I balance throughout development is crucial for pinpointing critical periods in E/I balance maturation, understanding the emergence of autism and for developing targeted support approaches.

Objectives:

To characterise thalamic GABA and glutamate concentrations in a large cohort spanning from 2-5 and 14-31 years of age, and associate these with age, sex and diagnosis (autism or TD).

Methods:

GABA and glutamate (Glx; the combined glutamate and glutamine) were quantified using PRESS and HERMES acquisitions on a thalamic voxel in two cohorts: preschool (74 participants; 24 autistic, 2-5 years of age) and adolescent/adult (141 participants; 90 autistic, 14 - 37 years of age; Table 1) from the AIMS-2-TRIALS PIP and LEAP studies. MRS data were processed using Osprey. GABA and Glx concentrations were quantified relative to creatine. Linear regression was used to explore if GABA, Glx and Glx:GABA ratios associate with sex, age and/or diagnosis, while controlling for site.

Results:

Thalamic Glx:GABA *ratios* significantly associated with age ($\beta_{\text{age}} = 0.13$, $p < 0.001$), and this further interacted with diagnosis ($\beta_{\text{diagnosis} \times \text{age}} = -0.06$, $p < 0.01$), and sex ($\beta_{\text{sex} \times \text{age}} = -0.06$, $p < 0.01$). Age-related shifts in E/I balance thus vary between autistic and TD cohorts, and across sexes. In TD males, TD females and autistic females, thalamic Glx:GABA increased throughout the developmental period studied (Figure 1). In autistic males, thalamic Glx:GABA was comparatively stable with age (Figure 1).

Conclusions:

Our findings support atypical E/I balance establishment in autism, with age, sex and diagnosis predicting Glx:GABA ratios from early childhood to adulthood. This study uniquely used a universal MRS approach across multiple sites (with identical acquisition and voxel parameters), in the largest MRS autism cohort to date. Furthermore, our work highlights the importance of looking at GABA and glutamate in relation to each other and exploring sex differences. While we did not observe direct age effects on GABA+ or Glx levels alone, existing research indicates that age-related changes in brain metabolites are pronounced during late childhood, a period not captured by the included cohorts. We plan to next explore how autism associated variations in Glx:GABA (E/I) balance associate with sensory processing differences, as these may serve as a tractable measure of E/I imbalances.

**437.103** The Neural Correlates of Sensory Overresponsivity in Adolescents with Autism Spectrum Disorder

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Background: Approximately 56-70% of youth with autism spectrum disorders (ASD) experience sensory over-responsivity (SOR), an extreme sensitivity to sensory stimuli, often paired with negative responses and avoidance of select sensory inputs. Functional magnetic resonance imaging (fMRI) evidence indicates that autistic individuals exhibit heightened activation in sensory cortices relative to their non-autistic peers, suggesting that neural hyperactivity may underlie SOR in this population (Jassim et al., 2021). Despite this, very little fMRI research has examined this hypothesis while differentiating between ASD youth with and without SOR.

Objectives: To this end, the present study aims to compare patterns of neural activation between youth with ASD and SOR (ASD_{SOR}), ASD and no sensory irregularities (ASD_{NS}), and non-ASD youth during sensory stimulation. We anticipate that ASD_{SOR} youth will exhibit greater activation in sensory regions of interest (ROIs) than ASD_{NS} and non-ASD.

Methods: A sample of 46 adolescents aged 11-15 (ASD_{SOR}: $n=17$, ASD_{NS}: $n=14$, non-ASD: $n=15$) were passively exposed to sensory stimulation (including visual and auditory) during fMRI. Visual stimuli were three flickering white-black circular checkboard wedges that rotated around a central fixation point and auditory stimuli were trains of complex tone bursts. Both sets of stimuli have been shown to elicit robust activation in sensory-related regions. Following preprocessing in SPM 12, whole brain BOLD responses were estimated separately for auditory and visual conditions. Subject-level beta weights for each condition were then extracted from a priori regions of interest (ROIs) for visual and auditory networks (Power et al., 2011) and entered into group-level analyses.

Results: A series of one-way ANOVA followed by contrast tests revealed statistically significant group differences in BOLD signal in two regions of the right visual association area (one posterior, one anterior) during the visual stimulation. In the anterior right visual association area, ASD_{SOR} exhibited greater activation than ASD_{NS} ($t[43]=2.84$, $p=.007$) while non-ASD participants exhibited greater activation than ASD_{SOR} ($t[43]=-2.19$, $p=.034$) in the posterior right visual association area. Significant group differences were also observed in the left primary auditory cortex and right superior temporal gyrus (rSTG) during auditory stimulation. In the left primary auditory cortex, ASD_{NS} participants exhibited increased activation relative to both ASD_{SOR} ($t[43]=-2.24$, $p=.03$) and non-ASD ($t[43]=2.50$, $p=.016$). In the rSTG, ASD_{NS} participants exhibited increased activation relative to non-ASD ($t[43]=2.32$, $p=.025$).

Conclusions: Only the anterior right visual association area demonstrated increased activation in ASD_{SOR} relative to ASD_{NS} while no SOR-linked hyperactivity was seen in auditory regions. Contrary to expectations, the ASD_{SOR} group exhibited decreased activation in the left primary auditory cortex relative to ASD_{NS}. In the posterior right visual association area, ASD_{SOR} participants demonstrated decreased activation relative to non-ASD participants. Taken together, these results provide partial support for the hypothesis that hyperactivity in relevant sensory cortices underlies SOR in ASD; however, the neural mechanisms of this condition may be more complex than previously thought. Although these results are preliminary, they highlight the need for further investigation into the complex brain-behavior relationship associated with SOR in autistic youth.

437.104 The Relationship between Voice Processing and Reading Ability in Young Children with Autism Spectrum Disorder

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Background: Autism Spectrum Disorder (ASD) often draws attention for its behavioral and social challenges, but learning difficulties due to the co-occurrence of developmental dyslexia have also been pointed out (Nation K et al., 2006). Research on the neural basis of developmental dyslexia has shown that children aged 8 to 12 with reading difficulties exhibit reduced lateralization of brain responses to auditory stimuli (Johnson et al., 2013). In at-risk children, atypical responses to phonological stimuli at 6 and 12 months of age have been observed, suggesting that such atypical brain activity could serve as an early marker of reading difficulties (Kuhl et al., 2022). However, the neural basis and early characteristics of children with both ASD and reading difficulties remain unclear.

Objectives: The purpose of this study is to conduct a longitudinal survey of children with Autism Spectrum Disorder (ASD) before and after school entry to examine whether early physiological data related to central processing of auditory information can serve as a predictive indicator of their literacy abilities during school age.

Methods:

Twenty children with Autism Spectrum Disorder (ASD) (15 boys, 5 girls), with an initial mean age of 72 ± 15.7 months and a follow-up mean age of 136 ± 25.2 months, participated in this study. ASD was assessed using the Diagnostic Interview for Social and Communication Disorders (DISCO) and the Autism Diagnostic Observation Schedule (ADOS).

At the time of the initial participation, cortical brain responses to two types of "ne" utterances (one with a flat intonation and one with an expressive intonation) were measured using magnetoencephalography (MEG) designed for infants. In this study, auditory-evoked responses (P1m) triggered by the more frequently presented flat-intonation "ne" were detected from both hemispheres using the dipole estimation method.

At the follow-up assessment, the K-ABC II was administered, and the scores for "word reading" and "word writing" were used as behavioral indicators of literacy skills. Multiple regression analysis was conducted to examine the relationship between P1m responses and literacy abilities, using P1m amplitude and latency from both hemispheres as dependent variables. The independent variables included the initial participation age, follow-up age, and the evaluation scores for word reading and word writing.

Results:

The results of the multiple regression analysis, with the P1m latency in the left hemisphere as the dependent variable, suggested a significant negative correlation with the word reading score. No significant correlations were found with age at initial participation, age at follow-up, or the writing scale.

Conclusions: As a result of this study, the latency speed of brain responses (P1m) to human voices before school entry was found to be particularly associated with higher word reading abilities later on. These findings are consistent with several previous studies that reported phonological responses as predictors of future literacy abilities, supporting the theory that phonological processing deficits are a causal factor in dyslexia. It is suggested that children with ASD who experience reading difficulties may have underdeveloped brain regions involved in phonological processing from an early stage.

437.105 The Role of the Ventromedial Prefrontal Cortex in Neural Mechanisms Linking Autistic Traits to Alexithymia

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Background: Autistic traits are distributed along a continuum within the general population and are associated with an increased risk of alexithymia. Previous research attributed the difficulties in emotion processing observed in autistic individuals to the presence of alexithymia. Nevertheless, the neural mechanisms linking autistic traits to alexithymia are undetermined. One potential explanation of this relationship is the underactivation of the ventromedial prefrontal cortex (vmPFC), which is associated with impaired affective Theory of Mind (ToM) abilities. However, the specific function of vmPFC in the relationship between autistic traits and alexithymia remains unclear.

Objectives: This study aimed to reveal the vmPFC-based neural mechanisms underlying the relationship between autistic traits and alexithymia, including its subscales.

Methods: A total of 73 neurotypical Chinese college students (51 females, age = 21.86 ± 2.32 years) completed a survey measuring autistic traits (Autism Quotient, AQ) and alexithymia (Toronto Alexithymia Scale-20, TAS-20). Brain functional images were obtained by resting-state functional magnetic resonance imaging (rs-fMRI). We conducted a Pearson correlation analysis between TAS-20 scores and whole-brain functional connectivity (FC) seeded in the vmPFC (Schmälzle et al., 2017), controlling for sex, age, and head motion (GRF corrected: cluster $p < 0.05$, voxel $p < 0.005$). The correlation between the significant FC and autistic traits was also examined. Mediation analyses accounting for the same covariates were conducted to investigate whether the significant vmPFC-based FC mediated the relationship between autistic traits and alexithymia and its subscales.

Results: Higher AQ scores significantly correlated with greater TAS-20 scores ($r = 0.563$, $p < 0.001$). Furthermore, a significant negative relationship was observed between TAS-20 scores and the FC of the vmPFC and bilateral putamen (left: $r = -0.433$, $p < 0.001$; right: $r = -0.413$, $p < 0.001$). These FC also negatively correlated to autistic traits (left: $r = -0.310$, $p < 0.001$; right: $r = -0.309$, $p < 0.001$) and mediated the effect of autistic traits on alexithymia (left: $\beta = 0.101$, 95%CI: 0.018 – 0.200, right: $\beta = 0.086$, 95%CI: 0.008 – 0.166, indirect effect) and its subscales. Specifically, the vmPFC-left putamen connectivity mediated the relationships between autistic traits and both difficulty identifying feelings (DIF, $\beta = 0.114$, 95%CI: 0.027 – 0.224) and difficulty describing feelings (DDF, $\beta = 0.070$, 95%CI: 0.004 – 0.154), but no mediation was found for externally oriented thinking (EOT, $\beta = 0.033$, 95%CI: -0.049 – 0.147). In contrast, the vmPFC-right putamen connectivity mediated the relationship between autistic traits and DIF only ($\beta = 0.097$, 95%CI: 0.019 – 0.185), with no significant mediation effects for DDF ($\beta = 0.055$, 95%CI: -0.034 – 0.126) or EOT ($\beta = 0.035$, 95%CI: -0.054 – 0.134).

Conclusions: Our findings indicated that the vmPFC-putamen connectivity mediated the relationship between autistic traits and alexithymia. Notably, the pathways mediating this relationship may differ across the dimensions of alexithymia, particularly in affective dimensions. Our findings contribute to the concept of neurodiversity by emphasizing that autistic traits exist on a continuum and may also result in alexithymia, thereby promoting understanding and mitigating social discrimination against autistic individuals.



437.106 Theta-Burst Stimulation over the Right Cerebellum Could Modulate Default Mode Network Connectivity in Autistic Adults

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Background:

Recent studies have demonstrated that the lateral cerebellum, especially Crus I/II, is associated with social functions, language and emotion and thus may serve as a potential target in alleviating autistic symptoms. The reduction of cerebellar Purkinje cells in autistic people leads to impaired inhibitory function and causes excitation/inhibition imbalance in the brain. This imbalance alters functional connectivity between the cerebellum and other brain regions, especially the default mode network (DMN) in autistic people. Despite these facts, no study has investigated the effect of repetitive transcranial magnetic stimulation (rTMS) on the lateral cerebellum in autistic people.

Objectives:

Our study aimed to explore the safety, feasibility and impacts of theta burst stimulation (TBS, a modified form of rTMS) applied to the right Crus I/II (lateral cerebellum) on intrinsic brain functional connectivity in autistic adults.

Methods:

In this open-label trial, we enrolled ten intellectually able autistic adults (7 males and 3 females, assigned sex at birth, aged 18- 29 years). Participants underwent a single session of neuro-navigated intermittent TBS (iTBS; 600 x 2 pulses spaced with a 15-minute interval at 80% of the active motor threshold) over the right Crus I/II. The right Crus I/II was individually localized using resting-state functional MRI. Resting-state functional MRI scans were scheduled before and immediately after the TBS intervention.

Results:

All of the autistic adults could tolerate a single iTBS session over the right Crus I/II without severe adverse events. The retention rate is 100%. We found intrinsic functional connectivity within the default mode network and somatosensory motor network significantly decreased post-iTBS 1200, while other networks remained unchanged. Moreover, our exploratory analysis showed the inter-individual variability (idiosyncrasy) post-TBS over the ventral attention, frontoparietal, default mode network and visual networks significantly decreased.

Conclusions:

Our pilot study demonstrated the safety and feasibility of applying iTBS over the lateral cerebellum in autistic adults. Moreover, we found that iTBS could modulate several functional networks in autistic adults. Our findings provide the pilot data for a neuroscience-informed, larger-scale, randomized controlled trial in the future.

437.107 Towards a Brain-Based Biomarker of Social Attention: Altered Cortical Hemodynamics in Temporal Regions in Toddlers with Autism

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Background: Diminished attention to the faces of social partners represents one of the earliest measurable *behavioral* markers of autism (AUT). This decreased attention is most pronounced when children observe a person using child-directed-speech and eye contact. Over the past two decades, neuroimaging studies using fMRI or fNIRS have been conducted to identify *brain-based* biomarkers of autism. Amongst the brain regions implicated in autism are bilateral superior temporal regions typically involved in audio visual processing of social cues. However, the practical difficulties to conduct task-based rather than resting-state neuroimaging studies with young children have led to a knowledge gap in the imaging literature during toddlerhood.

Objectives: 1) Assess the feasibility of task-based cortical activation studies using fNIRS with toddlers with and without autism. 2) Examine activation in bilateral superior temporal gyrus (STG) in response to ostensive cues comprising child-directed-speech and direct gaze. 3) Investigate associations between temporal cortical hemodynamics to social cues and 3a) social attention to a speaking face, 3b) social autism symptoms and 3c) receptive language (RL) skills.

Methods: 47 toddlers with autism and typically developing (TYP) toddlers (Mage=22.5, SD=4) took part in both fNIRS (full-head coverage NIRS NIRSport2 device) and screen-based eye-tracking (SR-Eyelink) studies during which videos of an actress using speech (SP) and/or eye contact (EC) were displayed. Feasibility measures: participants retention after exclusions due to capping, inattention, and signal quality. Hemodynamics measures: difference (Hb_diff) between oxy-hemoglobin (Hbo) and deoxy-hemoglobin (Hbr) in response to speech and gaze cues in both left and right STG. Phenotypic measures: looking time to the face in the speech and gaze condition (%Face), the ADOS-2 Social-Affect scores and the MSEL RL.

Results: 1) *Feasibility:* The retention rates were 76% (n=37) of TD and 65% (n=11) of AUT groups, and the rates did not differ by group, ($\chi^2(64)=0.12, p=0.725$). 2) *Hemodynamics:* in the left STG, TD toddlers exhibited increased hemodynamic response in conditions involving speech and reduced hemodynamic response in conditions without speech. In contrast, toddlers with AUT, left STG activity was negligible across all conditions. Regarding the right STG, TD toddlers showed a similar pattern of response (although reduced) as in the left hemisphere, but AUT toddlers exhibited increased response to conditions with speech and gaze cues. 3) *Associations with phenotypic features:* There were significant associations between Hb_diff in the left STG in the speech-and-gaze condition and %Face ($r(44)=.29, p=.048$), ADOS-2 Social-Affect ($r(43)=-.32, p=.033$) and MSEL-RL ($r(42)=.32, p=.034$). No associations were found with the right STG region ($p>.223$) (Figure1).

Conclusions: Toddlers with autism and TYP controls tolerated the fNIRS procedure well. Toddlers with autism display bilaterally atypical cortical activation in the STG in response to dynamic social engagement cues. In the left hemisphere, they fail to activate the STG to speech or gaze cues, and in the right hemisphere, they show lower discrimination between speech and gaze cues than controls. In the combined sample, cortical activity in the left STG predicts social and language functioning. The fNIRS-based indices of responsivity to speech and gaze may constitute a promising candidate biomarker for social and language vulnerabilities in toddlers.



437.108 Transcranial Magnetic Stimulation Lowers Neural Activity Linked to Sensory over-Responsivity in Autistic Adults

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Background: Sensory over-responsivity (SOR) refers to an exaggerated, aversive response to sensory stimuli, often associated with Autism Spectrum Disorder (ASD), and can disrupt daily life and communication (Carter et al., 2017). Neuroimaging studies have shown that individuals with severe SOR display heightened sensory region activity and difficulty adjusting to repeated stimuli, especially when multiple senses are engaged (Green et al., 2015, 2019). Despite the prevalence of SOR, no effective treatments exist (Yuan et al., 2022). Intermittent Theta-Burst Stimulation (iTBS), a type of non-invasive transcranial magnetic stimulation, targeted to the prefrontal cortex (PFC) induces long-lasting facilitatory effects on cortical excitability (Huang et al., 2007; Huang et al., 2005) and is already being used to treat depression (Somani et al., 2019). However, iTBS targeting non-sensory ASD-related symptoms shows inconsistent results (Oberman et al., 2015). Given that the PFC is involved in sensory regulation (e.g., Cakar et al., 2023; Green et al., 2019), stimulating the PFC with iTBS may improve SOR, and demonstrating the specific effects on sensory responses across SOR severity levels is crucial.

Objectives: This study aims to examine how brain activity changes after iTBS is delivered to the PFC and whether SOR severity predicts these changes in adults with ASD.

Methods: The study included 24 adults with ASD (ages 18-31) who self-reported SOR severity using the Sensory Processing 3-Dimensions (SP3-D) Inventory (Miller et al., 2017). Participants underwent an fMRI task at baseline and again one month later, immediately after iTBS was administered to the left dorsolateral prefrontal cortex (DLPFC). The iTBS was delivered using a Magstim Rapid 2 device with a Figure 8, 70mm coil at 80% of motor threshold intensity, consisting of 600 pulses in a 20 two-second on/8-second off cycle. The fMRI task involved six blocks each of alternating mildly aversive Auditory+Tactile and Visual+Tactile stimuli, with tactile stimulation from a scratchy glove, auditory stimulation via pink noise, and visual stimulation from a rotating color wheel. Brain activity changes pre- and post-iTBS were analyzed using FSL, and correlations between SOR severity and brain changes were explored, with statistical thresholds set at $Z>2.3$ and corrected for multiple comparisons at $p<.05$.

Results: After iTBS, brain activity decreased in primary sensory areas, including the auditory cortex and postcentral gyrus, during the Auditory+Tactile task (Figure 1A, top). Similarly, during the Visual+Tactile task, activity reductions were observed in sensory-processing areas, such as the visual cortex and insula (Figure 1A, bottom). Notably, greater SOR severity correlated with more enhanced reductions in activity in sensorimotor cortices, insula, and limbic regions (Figure 1B).

Conclusions: iTBS to the left DLPFC reduced atypical brain responses to mildly aversive stimuli in autistic adults with SOR. Participants with more severe SOR showed greater changes in sensory and limbic brain regions. These findings suggest that excitatory stimulation of the PFC may help regulate sensory processing in ASD, particularly for those with more severe SOR, positioning it as a potential non-invasive treatment for sensory processing challenges in ASD.



437.109 Unraveling Language Development Trajectories in Autism Spectrum Disorder: Electrophysiological Evidence

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Background:

Language difficulties are frequent in autism spectrum disorder (ASD) and significantly impact functioning. Autistic individuals can be classified into three language profiles: unimpaired (LU), impaired (LI), and minimally verbal (MV). In previous work, we identified these three profiles in autistic preschoolers and characterized each profile's trajectory and moderators. Building on these findings, the present study examines the associations between the language profiles and resting-state EEG (RS-EEG) power in autistic preschoolers and typically developing (TD) peers. Previous RS-EEG studies reported increased gamma and reduced alpha power in autistic children and adults. In preschoolers with ASD, increased frontal gamma power (FGP) was associated with language difficulties, emerging as a potential marker for language heterogeneity. However, no longitudinal study has focused on RS-EEG power to predict and characterize language development across the specific autistic profiles.

Objectives:

1. To investigate longitudinal trajectories of frontal alpha and gamma power in preschoolers with ASD compared to their TD peers.
2. To explore the association between FGP and language profiles in autistic children younger and older than 4 years, when global stability in language skills is typically

Methods:

Preschoolers with ASD and TD were recruited from an ongoing longitudinal cohort that includes RS-EEG recordings while quietly watching a cartoon. RS-EEG recordings were collected using a high-density EEG cap, yielding a robust dataset of 395 RS-EEG recordings from 126 children with ASD and 67 TD (age range: 1.3-7.6 years). A longitudinal subsample of 53 children with ASD and 42 TD (age range: 1.7-6.3 years), resulting in 155 RS-EEG recordings, has been analyzed. The language profiles of the 53 autistic children were: LU (N=32), LI (N=14), and MV (N=7). Due to the small MV sample, they were grouped with the language impaired. Signal oscillations were decomposed in canonical frequency bands: delta (1-4 Hz), theta (4-8 Hz), alpha (8-12 Hz), beta (12-30 Hz), and gamma (30-40 Hz). The average summed power for each frequency band was computed and normalized using a log base 10 transform.

Results:

Mixed-model analyses of frontal alpha and gamma power trajectories showed no significant differences between ASD and TD groups ($p > 0.05$). For children under 4 years, no significant differences in FGP were found among autistic children with or without language impairment, and TD peers. However, in children aged 4 and older, autistic children with impaired language exhibited increased FGP ($p = 0.035$) compared to TD children (Figure 1).

Conclusions:

Contrasting with previous studies, we did not find differences in frontal gamma and alpha activity between younger autistic and TD children. However, increased FGP was specifically associated with language impairments in autistic preschoolers older than 4 years, suggesting that FGP may vary as language profiles stabilize. We are currently investigating gamma and alpha power in a larger dataset and whether increased FGP could serve as an early marker of language impairment in ASD. These investigations hold promise for improving our understanding of the neural mechanisms underlying language trajectories in young autistic children and paving the way for personalized interventions.

**437.110** Unraveling Toddlers' Social-Emotionality and Language Interaction with Brain Network Controllability at Birth

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Background: In infants and toddlers, language and social-emotional outcomes are intertwined. For example, “late-talking” toddlers tend to lag in social-emotional development, and children with social-emotional impairments tend to engage less in peer conversations. However, little is known about how white matter development at birth supports this intertwined relationship between language and social-emotionality development.

Objectives: This study uses edge-centric network control theory and connectome-based predictive modeling to predict social-emotional and language development outcomes at 18 months from diffusion-weighted images collected at birth. We further investigate the role of the brain network at birth involved in the development of the intertwined social-emotional and language outcomes.

Methods: First, we constructed structural connectomes (a comprehensive map of white matter connections) using standard methods and quantified the edge controllability for 348 infants from the developing Human Connectome Project (dHCP). Edge controllability measures the contribution of each white-matter connectome within the brain structural network to drive system-level brain state transitions. Next, we used connectome-based modeling (a validated machine learning approach for connectome data) with 10-fold validation to predict social-emotional and language development. The Quantitative Checklist for Autism in Toddlers (Q-CHAT) assessed social-emotional development. The Bayley Scales of Infant and Toddler Development (BSID-III) assessed language skills. Finally, we tested how each network predicted the other measures (i.e., we used the SEN to predict language scores and vice versa) and if controllability at birth mediated the associations between social-emotional and language development at birth.

Results: CPM significantly predicted Q-CHAT scores ($r=0.22$, $p<0.001$; $MAE=6.91$) and BSID-III language scores ($r=0.21$, $p<0.001$; $MAE=3.95$). 275 edges comprised the predictive model for Q-CHAT--labeled social-emotional network (SEN), which mainly connected between the visual network and the somatosensory network. 344 edges involved in predicting language scores--labeled language network (LAN), concentrating between the visual network and the dorsal attentional network. 109 edges were common between SEN and LAN, connecting between the visual network and other networks including dorsal attention, default mode and subcortical networks. The edge average controllability in SEN inversely predicted the language scores ($r=-0.30$, $p<0.001$). Similarly, edge average controllability in LAN inversely predicted the Q-CHAT ($r=-0.25$, $p<0.001$). These predictions were inversely correlated with the correlations between BSID-III language and Q-CHAT scores ($r=-0.56$, $p<0.001$). Using a bootstrapped mediation analysis, the edge average controllability in SEN partially mediated the association between BSID-III language and the Q-CHAT scores ($r=-0.13$, $p<0.001$).

Conclusions: Our study leveraged the advances in network control theory to understand how early white matter structure supports future social-emotional and language development. Our findings show that controllability at birth predicts key 18-month outcomes. Additionally, networks for social-emotional and language development cross-predict outcomes. Finally, networks mediate later behavioral associations at 18-months. Together, these results suggest that the overlapping network in early life supports social-emotional and language development. These networks may open opportunities to design individualized interventions to promote optimal outcomes in those with developmental delays.



437.111 18-Kda Translocator Protein Signaling and Reward Circuitry Functioning in Autism Spectrum Disorder

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Background: The Social Motivation Hypothesis of Autism highlights disruptions in brain systems that process rewards as a factor that contributes to autism pathophysiology. In autism spectrum disorder (ASD), impaired social communication is associated with elevated inflammatory profiles^{1,2} and atypical neural responses to social reward³, leading to theories hypothesizing that immune dysfunction is an underlying mechanism of social impairments and ASD etiology⁴. However, our understanding of the mechanism underlying this potential relationship is still limited, and would provide insight into the development of treatments targeting inflammatory processes.

Objectives: To assess 18-kDa translocator protein (TSPO) expression from young adults with ASD to examine its impact on neural response to reward and ASD symptom severity.

Methods: Participants included 10 autistic and 6 typically-developing adults (ages 18-40). All participants completed a 90-minute simultaneous positron emission tomography magnetic resonance (PET-MR) scan using the radioligand [¹⁸F]PBR111 to assess TSPO expression, an index of immune functioning. During this scan, participants also completed a monetary incentive delay task⁵ to assess fMRI responses during reward anticipation and receipt. Areas related to reward processing and immune functioning were selected as regions of interest (ROIs). To examine regional group differences in TSPO radiotracer binding, a series of linear regressions were conducted in R. BP_{ND} in each ROI was used as the outcome variable so that contributions of diagnostic group could be assessed while controlling for age, BMI, and TSPO genotype.^{6,7} To determine the unique contribution of TSPO expression on ASD symptom severity, each ROI was first assessed using stepwise selection linear regression models to determine covariates that should be included in the model. The residuals from each of these models were then used as predictors in separate linear regressions to examine how TSPO expression in each ROI contributes to ASD symptom severity (SRS Total T-scores). Finally, we assessed fMRI responses during reward processing as a mediator of the relationship between TSPO expression and ASD symptoms (SRS scores) using the R “Lavaan” package⁸ to estimate the strength of the indirect and total effects.

Results: There were no differences between the ASD and comparison groups in TSPO expression. However, TSPO expression in several brain regions related to ASD symptom severity. TSPO expression in the precuneus (after controlling for BMI) was significantly positively related to SRS scores for autistic adults after FDR correction ($p=0.04$), while TSPO expression in the orbitofrontal cortex was negatively related to ASD symptom severity ($p=0.04$). fMRI responses to rewards in all ROIs did not significantly mediate the relationship between TSPO expression and ASD symptom severity.

Conclusions: This study contributes to our understanding of the complicated role of immune functioning in social symptoms in ASD. Although we did not observe statistically significant differences in regional TSPO expression, there were significant relationships between TSPO expression and ASD symptom severity. This provides further evidence that immune functioning is a contributing factor to ASD symptom severity, providing opportunities for future research to use inflammation as a treatment outcome variable or target in translational research to improve the quality of life of autistic individuals.



437.112 Visuospatial Attention Differences during Speech-in-Noise Perception Among Children with ADHD or Autism

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Background:

Many children with autism spectrum disorder (ASD) or attention deficit hyperactivity disorder (ADHD) have difficulty distinguishing speech in the setting of noise. This can impact learning and community participation. Prior work has implicated audiovisual integration of lip movements with speech sounds as a potential underlying mechanism, but the impact of deficits in spatial attention are important, often overlooked, confounders. Disambiguating the respective contributions of these two mechanisms to speech-in-noise perception difficulties in ADHD and ASD is a critical step in the design of mechanism-tailored supports or interventions.

Objectives:

We aimed to evaluate patterns of audiovisual integration and allocation of visuospatial attention during speech-in-noise processing among school-age children with ADHD, ASD, and TD.

Methods:

We recruited 7–12-year-old children with ADHD (n=33, Males-22/Females-11), ASD (n=22 Males-17/Females-5), and TD (n=28, Males-13/Females-15) to participate in an integrated virtual reality and electrophysiologic (EEG) speech-in-noise perception paradigm. In virtual reality, children were asked to press a button whenever a centrally-located target character spoke a target monosyllabic word, while ignoring any words spoken by two flanking distractor characters. We manipulated 1) AV content by intermixing trials containing either audio (speech sounds only), visual (lip movements only) or audiovisual (AV) representations of the three characters and 2) spatial attention demands by including trials with and without interference from the distracting speakers (See Figure 1). We measured audiovisual (AV) gain in target detection accuracy ($AV\text{ gain} = \text{Accuracy}_{AV} - \text{Accuracy}_{Audio}$). Simultaneously, steady-state visual evoked potentials (SSVEP) were continuously recorded via a 128-channel electrode array as an index of visuospatial attention allocation to each of the speakers. To elicit SSVEP, the target and distractor speakers were tagged with different visual frequency oscillations (23Hz and 15Hz, respectively). EEG signal-to-noise ratios (SNR) in the corresponding first and second harmonics for those frequency bands were measured over occipital scalp. These behavioral and EEG measures were compared between groups using mixed design analysis of variance with age as a continuous covariate and relevant post-hoc comparisons.

Results:

Children with ADHD showed reduced AV gain relative to TD controls (ADHD: $d'_{AV-Audio} = .096 \pm .078$; TD: $d'_{AV-Audio} = .502 \pm .129$, $p = 0.008$; Figure 2A,B). Children with ASD had a less pronounced reduction in AV gain relative to TD controls that did not reach significance (ASD: $d'_{AV-Audio} = 0.276 \pm .196$; TD: $d'_{AV-Audio} = .502 \pm .129$, $p = 0.180$; Figure 2A,C). TD controls also demonstrated more robust SSVEP at 23Hz and 46Hz (target speaker) than the children with developmental disabilities. Children with ADHD or ASD showed reduced selective activation in response to the target and more equivalent allocation of visuospatial attention between 23Hz target and 15Hz distractor frequencies (ADHD: $SNR_{23Hz} = 1.448 \pm .325$, $SNR_{15Hz} = 1.402 \pm .372$; ASD: $SNR_{23Hz} = .726 \pm .321$, $SNR_{15Hz} = 0.404 \pm .233$; TD: $SNR_{23Hz} = 2.993 \pm .513$, $SNR_{15Hz} = 1.738 \pm .421$; Frequency x Group interaction $F(6,237) = 5.034$, $p = .00009$; Figure 2D-F). Values reported are mean $\pm$ standard error of the mean.

Conclusions:

Children with either ADHD or ASD demonstrate a reduction in the typical perceptual benefit afforded by exposure to multisensory (AV) vs. unisensory speech stimuli, accompanied by substantial difference in allocation of visuospatial attention to the relevant speaker. Thus, dysregulation of selective visuospatial attention may impact their ability to effectively perceive language in noisy settings.

**437.113** Communication Impairment in ASD Linked to Glutamate Imbalance in N-Acetyl-Aspartyl Glutamate and Glutathione Metabolism.

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Background: Autism spectrum disorder (ASD) shows abnormalities in cognitive, affective and sensorimotor processing, with clinical manifestations commonly associated with frontal lobe lesions represented by Brodmann cortical areas and white matter tracts (Genu, arcuate fasciculus, uncinate, cingulate). Difficulty developing language and communication skills in ASD is a hallmark and although there are subtle differences between language and communication, it cannot be denied that they are linked. According to Rosselli, Ardila and Bernal (2015), one of the networks involved includes both the anterior cingulate gyrus (involved in motor organization: motor preparation/planning, cognitive/motor inhibition and language initiative) and BA6 (middle frontal gyrus), suggesting the involvement of the insula in a brain circuit that controls verbal initiative and maintenance of speech production. Here arises the hypothesis of glutamate imbalance affecting the cingulate cortices and its relationship with the metabolism of glutathione (GSH) and N-acetylaspartylglutamate (NAAG) as a cause of communication disorders in ASD.

Objectives: To understand and interpret how glutamate is involved in synthesizing NAAG and GSH as responsible for activating the brain areas involved in the language process through the networks formed by the cingulate gyrus in ASD. To study the correlation of GSH/Glu and NAA+NAAG/Glu ratios, with the “communication” in Autism Quotient (AQ) test for adults and using magnetic resonance spectroscopy (1H-MRS).

Methods: We quantified (NAA+NAAG), Glu, and GSH signals in anterior (ACC) and posterior (PCC) cingulated cortices separately from the 1H-MRS assessed in 19 patients with ASD and 42 healthy comparison subjects, matched for age, on a 3.0 Tesla MR scanner. We used the ‘Communication’ subscale of the Autism Spectrum Quotient (Baron-Cohen et al., 2001) Statistic one-way ANOVA and Bonferroni correction were applied. Pearson correlation hallmarks the goal.

Results: Pearson correlation plotted for ASD group shows negative correlation between AQ domain ‘Communication’ and (NAA+NAAG)/Glu ratio ($r = -0.1184$; $p = 0.9069$) in ACC, and GSH/Glu ratio shows negative correlation ($r = -0.2272$; $p = 0.8224$) in PCC; whereas TD group showed that communication is positively correlated with both (NAA+NAAG)/Glu and GSH/Glu ratios in both cingulated cortices (see Table 1; Figure 1). When comparing the correlation pattern of [(NAA+NAAG)/Glu] and [GSH/Glu] ratios with ‘Communication’ in AQ2, AQ3, and AQ4, an aberrant pattern of correlation was observed in the AQ2, AQ3, and AQ4 groups; indicating that they are related to glutamate for both (NAA+NAAG) and GSH in both cingulate cortices (see Table 2; Figure 2a, b). These results suggest the relation of the local overconnectivity within the language network and global underconnectivity of language with regions outside the network in ASD per that described by (Larson, C., et al. (2023).

Conclusions: Studying the interrelations between language and social communication in ASD may further clarify the correlation patterns reported here by providing evidence on the processes involved in the acquisition of communication skills. The ability to measure and monitor glutamate concentration in the cingulate cortices creates a promising new approach to intensify research on the effects of new drug candidates in ASD.



437.114 Exploring the Impacts of Methodological Choices on Frontal Alpha Asymmetry Electroencephalography Research in Autism

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Background: Autism, while increasing in prevalence, is still a relatively rare diagnosis. Therefore, EEG research with this population is relatively scarce, samples are small, and replications are uncommon. Resting state frontal alpha asymmetry (FAA) has been suggested as a potential biomarker for autism, as it has been related to cortical development and research has indicated a relationship between patterns for FAA and certain autism characteristics, such as social deficits, visual analytic skills, sensory hyporesponsivity, and sensory seeking behaviors. However, research has been less conclusive when comparing neurotypical and autistic individuals, or their respective siblings, with some research indicating greater left FAA in neurotypical individuals and their siblings and others suggesting greater right FAA. Some potential methodological reasons for this inconsistency are differences across studies in data preprocessing pipelines. While these methodological choices are theorized to influence the final cleaned dataset, few studies have investigated the extent to which these decisions impact researcher interpretations. Thus, investigating how the methodological differences within EEG preprocessing and analysis pipelines ultimately impact the final dataset and interpretations within a sample of autistic and neurotypical children, could provide valuable insight into why the field of autism EEG research continues to have difficulties establishing consistent findings.

Objectives: The present study assesses the impact of preprocessing methodologies, electrode selection, and alpha band frequency range definition on the finalized data and interpretations for a dataset comparing FAA between autistic and neurotypical children and adolescents matched on age and nonverbal IQ.

Methods: Eyes open and eyes closed resting-state EEG data was collected from 56 age- and IQ-matched autistic (n=28) and neurotypical (n=28) children and adolescents. These datasets will be cleaned using 3 different preprocessing pipeline guidelines popular within EEG research, for 4 different electrode groupings used within FAA research, and 2 different definitions of the alpha frequency band, resulting in 24 cleaned datasets for both conditions (eyes open and eyes closed).

Results: Determinations regarding the null hypothesis for each of the 24 cleaned datasets across conditions will be made using a 95% high density interval + region of practical equivalence Bayesian approach. The percent of agreement with regards to hypothesis decision will then be examined under both the eyes open and eyes closed conditions to investigate how robust the findings are across methodological selection. Furthermore, Bayesian regression analyses will be implemented to investigate which factor (preprocessing pipeline, electrode grouping, alpha frequency range) appears to most greatly impact the robustness of findings.

Conclusions: Current EEG research within autism lacks standardization with regards to preprocessing and analytic methodologies. Due to the infrequency of replicated studies, there is the potential for non-robust findings to gain traction within autism EEG research if results are only shown with one preprocessing and analytic pipeline. Thus, investigating the extent to which methodological choices have on ultimate data interpretations is critical for garnering greater insight into why consistent findings have been difficult to establish within the field of autism EEG research.

437.115 Multimodal Imaging in Autistic Adolescents and Adults - Biomarker Readiness - Reproducibility

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Background:

Multiple imaging modalities have been proposed, either alone or in combination, as representing candidate biomarkers for autism, with roles including diagnosis, prognosis, sub-population definition and treatment monitoring. However, while group distinguishing effects often appear promising there is little data on measurement precision, limiting effective planning for supporting future clinical trials, in terms of sample sizes and lower limits on resolvable changes resulting from intervention.

Objectives:

To establish the reproducibility of MEG, MRI and MRS measures in autistic adolescents and adults. To relate measurement precision to group differences (autism vs. neurotypical) as a proxy for the effect size anticipated as an upper limit in clinical trials of behavioral or pharmaceutical interventions.

Methods:

27 autistic adolescents and adults (age 14-45yrs) and 4 neurotypicals are reported. Each participant underwent MEG assessment of the auditory evoked M50 and M100 component latencies as well as MRI and MRS assessment of the excitatory and inhibitory neurotransmitters, glutamate and GABA, from bilateral superior temporal gyrus (STG) on 3 occasions (baseline, +4 weeks, +12 weeks). Analogous studies of motor related neural oscillatory activity and bilateral motor cortex MRS were also obtained. Acquisition, processing and analysis followed state-of-the-art published methods, including macromolecular-suppressed MEGAPRESS editing at 3T for the spectra. Data were considered in terms of inter-subject and intra-subject variability (coefficients of variation, CV). Additionally, group differences were assessed using linear mixed models with diagnostic group and hemisphere as fixed effects, age as a covariate and subject as a random effect.

Results:

Across the mixed cohort, mean M50 latency was 68 ± 8 ms, indicating a between-subject coefficient of variation of 12%. Intra-subject variability on the other hand was characterized by a smaller average CV of 4%, supporting the biological basis (and potential resolvability) of inter-individual differences. MRS results also indicated promising test-retest reliability with intra-subject CV's of 17% and 14% for auditory cortex and motor cortex respectively. There were not significant differences in either MEG or MRS reproducibility metrics between cohorts, although inter-subject variability tended to be greater in the autistic cohort.

Conclusions:

Establishing reproducibility metrics as well as effect sizes for candidate biomarkers is crucial. In this study, we observed intra-subject variability $\ll$ inter-subject variability for MEG-derived M50 latency measures, promising that observed inter-subject variability might be attributed to biological differences (rather than noise). Additionally, measurement precision was $<5\%$ promising sensitivity to small group differences and even smaller *intra*-individual changes arising from intervention. Knowledge of measurement precision (intra-subject variability) in conjunction with estimates of effect sizes are necessary to assess the utility of such biomarkers in resolving (and guiding the interpretation of) changes associated with interventions on an individual level.

437.116 Stimulus Preceding Negativity and Reward Anticipation to Social/Nonsocial Stimuli in 3-4 Year-Old Children

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Background: Anticipating social and nonsocial rewards is a critical aspect of both typical and atypical social-cognitive development. Prior research (Engle et al., 2021) shows that preschool-aged children exhibit distinct neural responses to dynamic social and nonsocial cues, suggesting early differential processing of these stimuli. In Autism Spectrum Disorder (ASD), the predictive coding hypothesis suggests that altered expectations about incoming stimuli, particularly social ones, may explain some difficulties in social communication and motivation. Differences in reward anticipation could impact social interactions compared to neurotypical (NT) peers. Investigating these neural mechanisms is essential for understanding the social deficits in ASD.

Objectives: This study investigates the neural correlates of reward anticipation, comparing the responses of 3-4-year-olds with ASD and NT peers to social (e.g., smiling faces) and nonsocial (e.g., toy cars) stimuli. We hypothesize that children with ASD will show altered anticipatory responses to social stimuli. If present, this suggests differences in processing social rewards, potentially contributing to social engagement difficulties; if not, their reward processing may be more similar to NT children than previously thought.

Methods: Our target sample size will include 26 children with ASD and 26 neurotypical children, between the age of 3 and 4. We used a passive S1-S2 paradigm with event-related potentials (ERPs) to measure the stimulus preceding negativity (SPN), an ERP component reflecting reward anticipation. Participants were presented with visual stimuli where S1 (a colored shape) predicted the upcoming presentation of either a dynamic social stimulus (a smiling face) or a nonsocial stimulus (a moving toy car) with an 80/20 probabilistic relationship. EEG was recorded from electrodes placed according to the 10-20 system, and SPN was analyzed in the 200 ms prior to S2 onset.

Results:

We now have data from 4 autistic children and 7 neurotypical children.

Figure 1a shows NT group data ($n=7$), where the SPN (200 ms before the stimulus, gray bar) for social trials (black line) is more negative than for non-social trials (red line). In contrast, Figure 1b shows ASD group data ($n=4$), where the SPN for social trials is more positive than for non-social trials. These trends are emerging but not yet definitive as data collection continues.

Figure 2 shows data from the NT group ($n=26$) from Engle et al. (2021), displaying a similar trend to our Figure 1a, with more negative SPN for social trials compared to non-social trials. We include this to illustrate a more complete NT dataset, highlighting the typical pattern of stronger anticipatory responses to social stimuli.

Conclusions: This study is the first to explore SPN responses to social versus nonsocial stimuli in 3-4-year-olds with ASD, offering insights into reward anticipation mechanisms. Preliminary findings suggest that, unlike NT children, those with ASD do not show larger SPN responses to social stimuli. This aligns with the predictive coding hypothesis, suggesting altered social reward predictions in ASD. These results highlight the role of disrupted reward anticipation in social communication difficulties, with implications for early interventions targeting social motivation.



438.118 Influences on Suicidality and Avenues for Suicide Prevention for the Autistic Community: An in-Depth Qualitative Exploration of Multiple Perspectives

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Background: Suicidality is common among autistic youth and adults, and significantly elevated compared to the non-autistic population. Mental health and suicide prevention are also top concerns that the autism community wants addressed in research. Suicide prevention efforts are needed that address the broad range of potential influences on suicidality.

Objectives: In the current study, we aimed to develop an in-depth understanding of influences on suicidality and avenues for prevention based on perspectives from autistic adults, family members, and mental health providers.

Methods: We used a community-based participatory research (CBPR) approach in partnership with 7 autistic adults with diverse backgrounds and experiences. We conducted a total of 38 in-depth qualitative semi-structured interviews to gather insight from: (1) autistic adults who have experienced suicidality ($N=16$), (2) family members of any age autistic person who has experienced suicidality ($N=8$), and (3) mental health providers who have worked with at least fifteen autistic clients experiencing suicidality ($N=14$). Autistic participants were 18-68 years of age ($M[SD] = 39 [13.5]$ years), and were 37.5% women, 25% men, 56% transgender, nonbinary, and/or gender-queer [*note: since gender categories are non-exclusive, percentages do not =100%]. Furthermore, 69% of the autistic participants identified as LGBTQIA+ and 62.5% identified within one or more marginalized racial or ethnic group. Family members were parents, siblings, and partner/spouse. Mental health providers reported 2-24 years of experience ($M[SD] = 10.7 [6.6]$ years) in fields including social work, psychology, psychiatry, and music therapy. Participants chose the interview format (live chat, voice, and/or video, or email). We analyzed the data using reflexive thematic analysis to identify themes related to influences on suicidality and avenues for prevention. Once that analysis was complete, we reviewed all of the excerpted data within each theme to develop autism-specific recommendations to enhance existing suicide prevention efforts.

Results: The analysis resulted in seven influences themes and seven prevention themes (see Table 1) subsumed within the following broad thematic concepts: (1) *Pervasive negative attitudes and neurotypical standards have a lasting impact on autistic people's lives*, (2) *Challenges and stressors add strain, making life feel overwhelming and hopeless*, and (3) *Difficulty regulating and managing emotions can increase the likelihood of suicidal feelings and actions*. Table 2 contains recommendations for tailoring suicide prevention efforts for the autistic community, which include supporting neurodiversity, accommodating autistic needs, and changing institutional practices that may harm autistic people.

Conclusions: The perspectives of a diverse sample of autistic adults, family members, and mental health providers reveal a wide range of risk factors contributing to suicidality, as well as opportunities for tailored suicide prevention efforts. Findings point to opportunities for improvements in societal treatment of autistic people as well as improved services and supports to inform a broader approach to suicide prevention.

**438.119 Investigating How Underlying Mechanisms Drive Disordered Eating Among Autistic People Who Have Experienced Childhood Trauma.**

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Background:

Autistic people are significantly more likely to experience childhood trauma (CT), including victimisation (Ohlsson Gotby et al., 2018) and physical abuse (Mandell et al., 2005). CT has been consistently linked with eating disorder (ED) development in general populations (Brewerton, 2022). However, a lack of research has meant that it is unclear how this relationship operates within Autistic people's EDs. Autistic people with EDs have highlighted the impact of early childhood experiences and trauma within ED development as research priorities for the community (Nimbley et al., *in prep*). Therefore, comprehensive investigations of CT, including how CT interacts with core mechanisms, may provide key insights as to why Autistic people are at higher risk of developing EDs (Nickel et al., 2019).

Prior qualitative investigations show that cognitive overwhelm, stemming from monotropic tendencies, sensory sensitivity, and camouflaging all play a key role in the development and maintenance of EDs in Autistic people (Buchan et al., *in prep*; Babb et al., 2021; Bradley et al., 2024). Monotropism is theorised to be the overarching cognitive processing style of Autistic people (Murray et al., 2005), and altered sensory perception and camouflaging are estimated to impact 75% and 90% of Autistic people respectively (Kirby et al., 2021). Given the prevalence of these traits across the Autistic community, and the fact that a comparatively small subset of the community goes on to develop EDs (Petersen et al., 2024), it may be that CT is operating as a moderator of these mechanisms within Autistic ED experiences.

Objectives:

To explore the moderating role of CT in the relationships between camouflaging, sensory sensitivity, and monotropism with ED behaviours in Autistic people.

Methods:

Data collection is ongoing* 45 Autistic participants with an eating disorder (mean age of 38.1 years; SD=13.6) have completed an online survey (final sample size estimated to be 280). The online survey includes the Eating Disorder Examination Questionnaire (EDE-Q; Fairburn & Beglin, 2008), the Childhood Trauma Questionnaire - Short Form (CTQ-SF; Bernstein et al., 2003), Camouflaging Autistic Traits Questionnaire (CAT-Q; Hull et al., 2019), Sensory Perception Quotient (SPQ; Tavassoli et al., 2014) and the Monotropism Questionnaire (Garau et al., 2023), a 47-item questionnaire used to measure intense attention and interests.

Results:

- Higher levels of sensory issues and camouflaging were related to higher levels of EDs.
- Preliminary moderated mediation analysis has revealed that levels of EDs were mediated by sensory profile levels and that this mediation was moderated by childhood trauma.
- Preliminary moderated mediation analysis has revealed that EDs were mediated by levels of camouflaging and that this mediation was moderated by childhood trauma.

Conclusions:

Analysis to date supports a model in which eating disorder outcomes in trauma exposed Autistic people may be directly related to sensory profiles and levels of camouflaging. The data suggests that camouflaging may be a viable therapeutic target for eating disorders. It also shows that society must become more understanding and accepting of Autistic people so that their need to camouflage will reduce and in turn potentially reduce levels of ED behaviours.

438.120 Longitudinal Outcomes of Autistic and Non-Autistic Adolescents and Adults with Catatonia Treated Prospectively with Electroconvulsive Therapy: A Single-Site Open-Label Naturalistic Study

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Background: Catatonia is a severe and often overlooked psychomotor syndrome that can commonly occur in individuals on the autism spectrum, with particularly high rates in those with co-occurring neurogenetic conditions, intellectual disabilities, and psychosis. However, very little evidence is available to guide the clinical treatment of catatonia in the autistic population, particularly outside of the acute phase of treatment (i.e., when a patient is ill enough to necessitate hospitalization).

Objectives: This study, through the analysis of routine outcome monitoring data, sought to describe the effectiveness of current standard-of-care electroconvulsive therapy (ECT) practices in use at Vanderbilt University Medical Center (VUMC) for the treatment of catatonia in autistic individuals, individuals with other neurodevelopmental disabilities, and those with other forms of unrelated catatonia.

Methods: A total of 29 individuals were included in the study (Mean [SD] age 28.62 [17.77] years; range 12–79), representing 732 individual ECT treatment sessions. Of the patients included in the study, 11 [37.9%; 46.7% of visits] had a recorded autism spectrum disorder diagnosis and 15 total [51.7%; 62.8% of visits] had catatonia associated with a neurodevelopmental/neurogenetic syndrome. The study population was drawn from all individuals with relevant diagnoses who underwent at least a full induction course of 12 ECT sessions at VUMC and had catatonia-related outcome data recorded (earliest 2023). All electrode placements were bitemporal, and charge was titrated to an individualized dose based on seizure duration. Descriptive statistics were analyzed, and Bayesian hierarchical models were used to quantify individual ECT outcomes and assess for differential response by autism status.

Results: Participants were followed for a median of 20 (IQR [16, 31]) ECT sessions over a median of 146 (IQR [101, 291]) days past the initial ECT consultation. Over time, participation in ECT was associated with large standardized decreases in the clinical severity of catatonia (CGI-S; $b_{Std} = -1.011$, $CrI_{95\%} [-1.485, -0.515]$, $P_d > .999$). Although not reaching traditional statistical significance, there was >90% posterior probability of patients in the autistic group demonstrating less CGI-S improvement than non-autistic patients over time ($b_{Std} = 0.485$, $CrI_{95\%} [-0.224, 1.133]$, $P_d = .910$). Empirically-derived subscales of the Bush-Francis Catatonia Rating Scale (BFCRS) demonstrated a similar pattern, with main effects all trending towards improvement with ECT (Excited: $b_{Std} = -0.111$, $CrI_{95\%} [-0.256, 0.026]$, $P_d = .940$; Akinetic: $b_{Std} = -0.424$, $CrI_{95\%} [-0.695, -0.178]$, $P_d > .999$; Parakinetic: $b_{Std} = -0.535$, $CrI_{95\%} [-1.007, -0.031]$, $P_d = .980$) and non-significant autism*time interaction terms (Excited: $b_{Std} = 0.069$, $CrI_{95\%} [-0.125, 0.284]$, $P_d = .750$; Akinetic: $b_{Std} = 0.186$, $CrI_{95\%} [-0.272, 0.576]$, $P_d = .796$; Parakinetic: $b_{Std} = -0.044$, $CrI_{95\%} [-0.737, 0.579]$, $P_d = .676$).

Conclusions: Autistic and non-autistic individuals receiving ECT for catatonia do seemingly improve along standard symptom measures. Though not clearly replicated across measures, there is at least some evidence from the CGI-S that the autism group had a less significant rate-of-change with intervention than the non-autistic group, which would indicate that these participants are doing exhibiting poorer ECT outcomes longitudinally and/or requiring more protracted ECT courses to achieve the same outcomes. Further work, including the prediction of ECT outcomes for catatonia using existing naturalistic data, is ultimately necessary to improve the care of autistic and non-autistic patients with this often life-altering condition.

438.121 Longitudinal Trajectories of Loneliness in Autistic Adolescents: The Role of Depression and Anxiety Symptoms

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Background: Loneliness is a public health crisis linked to increased mortality and physical and mental health issues (Leigh-Hunt et al., 2017).

Research shows loneliness is particularly elevated in autistic youth and associated with anxiety and depression (Hymas et al., 2022). Only one study has examined its development over time, finding that loneliness increases in autistic youth from adolescence into young adulthood (Schiltz et al., 2023). No research has examined predictors of change in loneliness and as a result, little is known about its development in autistic adolescents.

Objectives: To examine the trajectories of loneliness in autistic adolescents and investigate predictors of changes in loneliness.

Methods: Participants were 23 autistic adolescents ($M_{age} = 15.98$, $SD_{age} = 1.13$; 16 male assigned at birth) with $IQ \geq 80$ ($M_{IQ} = 113.09$, $SD_{IQ} = 12.71$) with pre-existing clinical and/or school autism diagnosis supported by a Social Communication Questionnaire (SCQ) score > 7. Participant demographics are displayed in Table 1. Data were collected at two timepoints separated by 6 to 10 months ($M_{mo} = 8.71$, $SD_{mo} = 0.98$), while participants were waiting to begin an intervention study. Caregivers completed the Social Responsiveness Scale (SRS-2), a measure of autism traits. Adolescents completed questionnaires assessing quality of life, anxiety (Anxiety Scale for Children–Autism Spectrum Disorder; ASC-ASD), and depression (Beck Depression Index; BDI-2). Four items from the quality of life measure, reflecting satisfaction with relationships and social activity, were summed to create a loneliness subscale. Higher scores indicated greater satisfaction and thus lower loneliness, with good reliability ($\alpha = .84$). Correlations between loneliness and other variables were computed. Multilevel models were used to predict changes in loneliness over time. Two separate models were run, using depression or anxiety symptoms as the predictor, while controlling for age, sex assigned at birth, gender, and autism traits.

Results: At baseline, higher loneliness correlated with higher anxiety and depression symptoms (all $ps < .05$), but not with age, sex, or autism traits (all $ps > .05$). The multilevel model of loneliness revealed an ICC of 0.48, indicating that 52% of the variability in trajectories of loneliness is explained by within-person differences. Controlling for age, sex, gender, and autism traits, depression – but not anxiety – significantly predicted changes in loneliness over time. Specifically, simple slopes indicated that participants with lower depression symptoms (-1 SD) experienced significant increases in loneliness, while no other group experienced changes in loneliness (see Figure 1).

Conclusions: This represents one of the first longitudinal investigations of loneliness in autistic adolescents. Consistent with previous literature, loneliness was associated with elevated depression and anxiety. We did not find an association with autism traits, despite a considerable range of scores, suggesting that co-occurring psychopathology, rather than autism itself, drives loneliness in autistic youth. Our results also demonstrate an increase in loneliness over time, specifically for those autistic adolescents not already endorsing elevated loneliness and depression. This finding is consistent with previous research demonstrating increases in loneliness across adolescence. Further, it aligns with prior work identifying adolescence as a particularly salient period for social development, highlighting the need for targeted assessment and intervention focused on loneliness in autistic adolescents.



438.122 Examining the Relationship between Pupillary Light Response and Aggressive Behavior in School-Aged Children with and without Autism: Results from the Autism Biomarkers Consortium for Clinical Trials (ABC-CT)

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Background: Aggressive behavior is seen in a large percentage of autistic youth and can contribute to substantial impairment. Factors that contribute to aggression remain relatively unknown, including autonomic arousal and anxiety. The pupillary light response (PLR) is a physiological measure of arousal, and previous studies have indicated that autistic people demonstrate an increased latency to pupillary constriction when compared to non-autistic peers. Aggressive children have demonstrated similarly sluggish autonomic responses. In non-autistic children, anxiety has also been linked to aggression. However, this relationship has received less research attention in autism.

Objectives: To examine whether latency to pupillary constriction is related to aggressive behavior, and whether this relationship is stronger in autistic children. To explore correlations with anxiety levels.

Methods: As part of the Autism Biomarkers Consortium for Clinical Trials, parents of 399 school-aged children (280 autistic) completed the Aberrant Behavior Checklist (ABC). We examined scores on the Irritability scale (ABC-I). Participants also completed an eye-tracking battery including a PLR task, measuring their latency to minimum pupil size acceleration via 18 trials of a dark screen with a central animation, then a flash of white, followed by the return of the initial image (Shic et al., 2022). Full-scale IQ (FSIQ) scores were determined using the Differential Ability Scales-II. We computed correlations to determine which child and family characteristics related to ABC-I. We then fit a multivariable linear regression to examine whether (1) average pupillary latency (APL) and/or (2) diagnostic group predicted aggression, measured by the ABC-I. Finally, we calculated Pearson correlations to understand the relationships between t-scores on the Child & Adolescent Inventory Generalized Anxiety scale (CASI-GA) and aggression, pupillary latency, and demographic characteristics.

Results: Because both FSIQ and family income related to ABC-I, these variables were included in the first step of a regression model. We added diagnostic group and APL as the second step and an interaction term between diagnosis and APL in the third step. In this model, FSIQ and Income both significantly contributed to account for variance in the ABC-I scale. When diagnosis and APL were added, model fit significantly improved; income and diagnosis accounted for a significant portion of the variance, but APL was non-significant. The inclusion of an interaction term did not improve model fit, suggesting an effect of diagnosis but no interaction between diagnosis X APL (Table 1). In our exploration of anxiety, CASI-GA scores were significantly correlated with ABC-I, as well as age, income, and FSIQ, but not with APL (Table 2).

Conclusions: In this sample, we did not observe an interaction between autism diagnosis and pupillary latency when predicting aggression levels. There was a significant association between full-scale IQ and aggression, successfully replicating the pre-existing literature. Furthermore, annual household income was negatively associated with aggression, potentially representing decreased access to interventions and socioemotional supports. Future research could examine pupillary latency in an aroused condition, as well as select participants whose aggression scores fall above the clinical cutoff to better elucidate potential relationships between these variables.

**438.123** Mediating Effect of Anxiety on the Relationship between Sleep Difficulties and Deficits in Social Motivation Among Autistic Youth

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Mediating Effect of Anxiety on the Relationship Between Sleep Difficulties and Deficits in Social Motivation Among Autistic Youth

Background: Sleep difficulties have been shown to be strongly associated with increased social difficulties in autistic youth (Veatch et al. 2017). Additionally, nearly 40% of autistic youth also experience anxiety-related symptoms (van Steensel et al., 2011). Limited research has evaluated the effect of anxiety on the relationship between sleep difficulties and deficits in social motivation among autistic youth. We hypothesized that in autistic youth, greater severity of sleep difficulties would predict increased impairments in social motivation through the effects of anxiety-related problems.

Objectives: To investigate whether total anxiety-related problems mediate the relationship between sleep difficulties and deficits in social motivation among autistic youth.

Methods: Participants were youth diagnosed with autism spectrum disorder ($N = 54$; $M_{age} = 9.630$, $Range_{age} = 6-17$ years; Sex [Male %] = 75.900%). Sleep difficulties were measured using the total scores from the Children's Sleep Habits Questionnaire (CSHQ; Owens et al., 2000). Anxiety-related symptoms were measured using the total sum score from the Screen for Child Anxiety Related Disorders (SCARED; Birmaher et al., 1997). Social motivation was assessed using the social motivation subscale T -scores from the Social Responsiveness Scale (SRS-2; Constantino et al., 2012). On all parent-report measures used, higher scores indicated greater severity of symptoms. Descriptive statistics were obtained using SPSS and the mediation analysis was performed using PROCESS Macro in RStudio.

Results: Results of the mediation analysis revealed that anxiety-related problems significantly mediated the relationship between sleep difficulties and deficits in social motivation ($ab = 0.452$, 95% CI [0.104, 0.921], $p < .050$). For every one-point increase in the CSHQ total score, SRS-2 social motivation subscale T -scores increased by 0.452 through the effects of anxiety-related problems. There were also several significant direct effects. Sleep difficulties were a significant predictor of total anxiety-related problems, such that for every one-point increase on the CSHQ, scores on the SCARED increased by 0.741, 95% CI [0.308, 1.175], $p = .001$. Total anxiety-related problems were a significant predictor of impairments in social motivation, such that for every one-point increase on the SCARED, SRS-2 social motivation subscale T -scores increased by 0.610, 95% CI [0.413, 0.807], $p = .001$. Sleep difficulties were a significant predictor of impairments in social motivation. However, we found that for every one-point increase on the CSHQ, SRS-2 social motivation subscale T -scores decreased by 0.419, 95% CI [-0.760, -0.080], $p = 0.017$.

Conclusions: These findings suggest that in autistic youth, anxiety-related problems may explain the relationship between sleep difficulties and impairments in social motivation. Our model indicates two paths that are consistent with previous research: there is a positive relationship between sleep difficulties and anxiety-related problems and there is also a positive relationship between anxiety-related problems and impairments in social motivation (Briot et al., 2020; Nadeau et al., 2015). Further studies should replicate this model and aim to develop interventions that target sleep difficulties and anxiety-related problems concurrently in autistic youth, which can lead to improvements in social motivation.

**438.124 Mental Health Crisis App Usage for the Autism Community**

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Background: Suicide prevention is a top priority for the autistic community. Research shows significantly higher rates of suicide death, attempts, and ideation among autistic vs. non-autistic people from childhood through adulthood. Crisis hotlines and chat services are a highly recommended suicide prevention strategy, but evidence lacks about whether they meet the needs of autistic people in crisis. Safe-UT is an app-based crisis chat and tip line based in Utah (USA) that provides real-time mental health crisis intervention for students in elementary through higher education, parents/guardians, and educators. Safe-UT is staffed by Master's-trained clinicians.

Objectives: The purpose of this study was to examine autism-related crisis app messaging in order to understand usage patterns and identify future needs.

Methods: We accessed the content of chats and tips across a 5 year period after all potentially identifying data was expunged by the Safe-UT data team. We used keyword searching to identify messages including explicit mention of autism and then applied an inductive content analytic approach to organize the data. We coded the user type and message intent, allowing new codes when new usage patterns were identified.

Results: Between 2017 and 2022, there were 170,889 encounters on the app. We reviewed these, finding 1,158 (0.7%) that included explicit mention of autism. See Figure 1 for the distribution of autism mentions. Over half ($n=700$; 60.4%) of those encounters were related to seeking help for an autistic person's mental health (inclusive of diagnosed and possible autistic identity mentions), and 88.6% of the time the autistic person was the app user. Specific topics prompting app usage included passive and active suicidality, self-harm, panic, emotional pain, abuse, distress over interpersonal/relationship difficulties, and questioning one's own autistic identity. Other frequent autism-related encounters included mental health challenges experienced by family members of autistic people (e.g., siblings, parents: $n=211$; 18.2%). A notable proportion of the encounters included mention of an autistic person within a description of someone else's mental health challenge ($n=107$; 9.2%)—examples included relationship difficulties with an autistic person or an autistic person being listed as a source of support.

Conclusions: Explicit autism mentions were relatively rare compared to the overall app usage. Given the rates of autism in the population as well as the high documented rates of suicidality, we believe the discrepancy between expected vs. actual use may reflect limited comfort with the app by autistic people and/or limited disclosure of autism diagnostic status within the chats. Despite lower than expected rates, our findings do indicate a clear need for crisis workers who have autism knowledge in order to support autistic people in crisis, as well as to discuss autism-related topics with family members and other app users who bring up autism in their chats. Future work is needed to understand potential barriers to usage for autistic people as well as the effectiveness of care provided to autistic people through crisis lines.

**438.126 Modeling a Step By Step Framework to Broaden Outcome Research Contributing to Evidence-Based Practice**

Recommendations: The Example of Sleep

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Background: Evidence-based practice (EBP) guidelines intended to translate high-quality psychosocial outcome research into effective interventions have a more limited impact when they draw only upon Randomized Control Trials (RCTs), and when they only generate very broad recommendations. Our multi-step framework (see Figure 1) draws directly from a greater range of high-quality outcome research studies to generate targeted EBP recommendations that community-based practitioners can translate confidently and directly into individualized intervention goals. We believe that, once guidelines using high-quality RCTs have broadly established a psychosocial practice as evidence-based, other high-quality outcome research studies can generate specific but qualified recommendations that can also be considered evidence-based.

Objectives: To pilot the application of this framework to EBP guidelines developed by the American Academy of Neurology (AAN) to improve sleep using psychosocial interventions. We hypothesized that this framework would increase the number of recommendations drawn directly from individual outcome research studies that target specific samples, interventions, and/or outcomes, and that can be considered evidence-based.

Methods: We applied the 8 step framework (see Figure 1) to the AAN Sleep guidelines, and related outcome research studies.

Results: The EBP recommendation related to psychosocial interventions from the AAN report (Step 1) provided few details: e.g., “Clinicians should counsel parents regarding strategies for improved sleep habits with behavioral strategies as a first-line treatment approach, either alone or in combination with pharmacologic or nutraceutical approaches”. Two RCTs meeting the AAN’s stringent quality standards (Step 2) were used to generate recommendations offering more details about who might benefit, the practices used, and the intervention targets (Step 4): e.g., “For 4-10 year olds with ASD who have mixed sleep onset and maintenance insomnia, parent-based sleep education delivered in a group format combined with behavioral strategies such as extinction should improve bedtime resistance, sleep onset latency, sleep continuity, and/or total sleep time.”. A literature search identified more than 30 related outcome research studies (Step 5); most were not RCTs, and some included children with Intellectual / Developmental Disabilities (I/DD) but not ASD. In total, these studies generated more than 35 recommendations that addressed a much broader range of sample characteristics and intervention targets (Step 8). Some also suggested the potential for more rapid, significant, and sustained progress: e.g., “In 3-7 year olds with ASD and sleep terrors, scheduled awakenings may help to reduce sleep terrors completely within 1-3 weeks, with progress maintained for more than 6 months. This progress may depend upon weekly progress monitoring by an experienced professional.”. These studies were also more likely to provide the kinds of critical details about interventions that practitioners need to implement them successfully.

Conclusions: By helping to generate a broader range of more specific recommendations drawn directly from outcome research, this framework can begin to close the significant and longstanding gaps between research and evidence-based community practice. The next step - establishing which studies meet quality standards - will confirm which of these recommendations practitioners might begin to adopt confidently, supported by more stringent progress monitoring.



438.127 Network Analysis to Examine Phenotypic and Physiological Correlates of Irritability in Autism

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Background: Irritability is a prevalent and disabling challenge for many autistic individuals. Our recent scoping review revealed significant gaps in our understanding of the demographic and phenotypic correlates of irritability that can ultimately inform approaches for support and care. In particular, we found that existing studies often consider influencing factors of irritability in siloes. This is a challenge as many of these factors, including demographic and phenotypic features, can be highly interconnected.

Objectives: This study used network analysis to characterize the multi-dimensional association between irritability symptoms and demographic and phenotypic factors.

Methods: The study sample included children aged 7-16 years with an IQ ≥ 85 , who either had a diagnosis of autism (60 participants) or were neurotypical (73 participants). Behavioral data included measures of irritability (Aberrant Behavior Checklist; ABC), autism features (Social Communication Questionnaire; SCQ), anxiety (Screen for Child Anxiety-Related Disorders; SCARED), emotion regulation (Emotion Dysregulation Inventory; EDI), externalizing symptoms and attention deficit/hyperactivity features (Child Behavior Checklist; CBCL), sensory differences (Short Sensory Profile; SSP) and temperament traits (Temperament in Middle Childhood Questionnaire; TMCQ; and Early Adolescent Temperament Questionnaire; EATQ). Network analysis was conducted using the ‘bootnet’ package in R with the ‘estimateNetwork’ function and the EBICglasso method for network estimation. Centrality analysis was performed to determine the importance of nodes, focusing on node strength, while network stability was assessed using the CS-coefficient. Community detection was carried out using the Clique Percolation Method (CPMw) to identify interconnected substructures. The reliability of strength centrality and edge weights was evaluated through bootstrapping.

Results: The original dataset included data from 193 participants. After excluding participants with missing phenotypic or demographic data, data for 133 participants were available for the full analysis. Network analysis of demographic and phenotypic variables revealed a dense network with 50 out of 91 possible connections (55%). Key correlations emerged between irritability and other variables: in one group, irritability showed direct positive correlations with externalizing problems, negative affect, and effortful control. In another, it was directly linked to emotion dysregulation, autism features (SCQ), anxiety, and negative affect. Indirectly, irritability was associated with sensory profile, surgency, and sex. Attention deficit/hyperactivity correlated positively with externalizing problems and negatively with effortful control but was not part of any community.

Overall, node strengths and edge weights were stable (CS-coefficients > 0.5).

Conclusions: This study improves our understanding of the complex relationships among demographic, phenotypic, and physiological factors linked to irritability in autism. Network analysis revealed strong direct associations between irritability, externalizing behaviors, emotion regulation, and temperament traits, with indirect links to attention deficit/hyperactivity. Additionally, the findings highlight the interconnectedness of irritability with anxiety and social communication differences. This research lays the foundation for future studies that can further explore these associations, with an emphasis on physiological factors and their role in irritability. The study’s limitations, including its correlational nature and small sample size, call for caution in interpreting the findings and highlight the need for further research to explore causality.

438.128 Neurodivergent Strengths and Wellbeing: Insights from Autism and ADHD

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Background: Strengths-based approaches, which shift away from traditional deficit-based models, are becoming increasingly common in neurodevelopmental research. Recently, Taylor et al. (2023) showed that autistic and non-autistic adults do not differ in the strengths they report, although autistic adults recognise and utilise their personal strengths less in their everyday lives. Nonetheless, increased strengths use predicted better subjective wellbeing, improved quality of life, and lower levels of anxiety, depression and stress among both autistic and non-autistic adults. In contrast, relatively little is known about the psychological strengths that may be a feature of ADHD, a neurodevelopmental condition that often co-occurs with autism. Knowledge and use of personal strengths by adults with ADHD, and whether, like in autism, these factors play a role in their life outcomes, is also unknown.

Objectives: To address these gaps in the literature and complement the findings in autism, we conducted the first well-powered study of self-reported strengths, strengths knowledge and strengths use in ADHD. Specifically, we investigated whether: (1) strengths proposed to be particularly salient to ADHD are, indeed, more strongly endorsed by adults with ADHD than their neurotypical peers; (2) adults with and without ADHD differ in their strengths knowledge and strengths use; and (3) knowledge and use of one's strengths predicts wellbeing, quality of life, and mental health.

Methods: Adults with ($n = 200$) and without ($n = 200$) ADHD were recruited online and matched on age, sex, education level, and subjective socioeconomic status, controlling for autism diagnosis. Participants rated their endorsement of 25 putative ADHD-related strengths and completed self-report measures assessing strengths knowledge, strengths use, subjective wellbeing, physical-, psychological-, social- and environmental quality of life, and mental health. Using Frequentist and Bayesian analysis methods, we compared the ADHD and non-ADHD groups, and explored the associations of strengths knowledge and strengths use with outcomes across both groups, contrasting these findings with the associations in autism.

Results: We found that the ADHD group endorsed 10 strengths more strongly than the non-ADHD group, including hyperfocus, humour and creativity, while the non-ADHD group reported slightly greater endorsement of perseverance as a personal strength. However, adults with and without ADHD reported similar endorsement of the remaining 14 strengths, highlighting that there were more similarities than differences between the two groups. Contrary to the findings in autism, adults with and without ADHD did not differ in their strengths knowledge and strengths use. Furthermore, in both groups, increased strengths knowledge was associated with better wellbeing, improved quality of life across all domains and fewer symptoms of depression, anxiety and stress.

Conclusions: While certain strengths are more salient in adults with ADHD, they show similar knowledge and use of their personal strengths as their neurotypical peers. Our study complements the literature on autistic strengths and highlights that leveraging psychological strengths, irrespective of a neurodevelopmental condition diagnosis, has the potential to improve neurodivergent people's lives. These findings offer novel insights into the conceptualisation of ADHD and serve as a springboard for future research to explore strengths in neurodevelopmental conditions using objective measures.

438.129 Outcomes in Children at Elevated Likelihood for Autism and Early Developmental Regression: Combining Retrospective and Prospective Methods

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Background: Developmental regression, typically defined as the loss of acquired skills before age 3, affects about 30% of autistic children according to retrospective parental reports (Tan et al., 2021). However, a prospective study of siblings at elevated likelihood (EL) for autism found that most autistic children exhibited early skill loss (Gangi et al., 2019). Additionally, reported regression is often followed by increased Restricted and Repetitive Behaviours (RRBs; Bradley et al., 2016). Considering the likely high prevalence of regression in autism and its impact, future research using both retrospective and prospective methods is crucial to better understand its characteristics and outcomes.

Objectives: The first objective is to explore the occurrence of regression before age 3 using retrospective and prospective methods, and their agreement. The second objective is to evaluate outcomes following regression at age 3 and 9.

Methods: This study comprised a longitudinal sample of 100 EL-children including younger siblings of autistic children (EL-sibs; $n=52$; 54% male) and preterm-born children ($n=48$; 56% male; gestational age <30 weeks). Regression in EL-sibs was assessed prospectively using Mullen Scales of Early Learning (MSEL) change-score analysis at 10, 14, 24 and 36 months, and retrospectively via parent report at 36 months (Autism Diagnostic Interview (ADI-R)). In preterms, regression was only measured retrospectively at 36 months (ADI-R).

Outcomes, measured at 3 and 9 years, included IQ (MSEL and Wechsler Intelligence Scale (WISC-V)), autism characteristics (Autism Diagnostic Observation Schedule (ADOS-2)), parent-reported RRBs (ADI-R RRB scale and the Repetitive Behaviour Scale (RBS-R)) and diagnosis (autism, other atypical, typical).

Results: Prospective MSEL change-score analysis showed a 21.2% ($n=11$) regression prevalence in EL-sibs. Among EL-sibs, 52.6% of those with autism had an observed regression, a significantly higher percentage compared to children with atypical development (16.7%; $\chi^2(1)=5.246, p<.05$) and typical development (20%; $\chi^2(1)=3.780, p<.05$). The ADI-R of only one parent confirmed regression based on the MSEL change-score, showing very low agreement of 2% (Cohen's Kappa=-.05; $p=.717$).

Retrospective ADI-R reports indicated a regression prevalence of 8.2% ($n=8$) in our total sample. Among EL-sibs and preterms with autism, 21.4% had a reported regression, a significantly higher percentage compared to atypically (2.5%; $\chi^2(1)=6.199, p<.05$) and typically developing children (3.44%; $\chi^2(1)=4.275, p<.05$).

With regard to outcomes (see also **Table 1**), EL-sibs with prospectively identified regression showed more social-communicative difficulties ($p<.05$) by age 3. In addition, retrospectively identified regression in both EL-sibs and preterms was linked to more reported RRBs at age 9 ($p<.01$), particularly ritualistic and compulsive behaviours ($p<.01$).

Conclusions: Consistent with previous findings, a higher prevalence of autistic regression was found using a prospective approach (53%) compared to retrospective reports (21%). Remarkably, there was almost no agreement between both methods. Regression occurred in both atypical and typical development but was most common in autism.

Although most measures show no differences in outcomes, prospective measures associated regression with increased social-communicative difficulties at age 3, whereas retrospective measures linked it to increased RRBs at age 9. These findings suggest a more challenging trajectory after regression, though further research is needed due to varying results based on how regression is operationalized.



438.130 Patterns of Mood Symptoms and Medication Use Associated with Co-Occurring Intellectual Disability Among Autistic Individuals Presenting in Crisis

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Background: Autistic individuals present in emotional and behavioral distress in many ways, complicating the delivery of medical and psychiatric care. Co-occurring intellectual disability (ID) and/or impaired communication further impedes the identification of conditions that may be contributing to distress. While autism is associated with increased vulnerability to mood disorders, little is known about how autistic individuals with and without ID differ regarding mood disorder symptomatology when presenting in crisis.

Objectives: To describe differences in mood symptoms and mood stabilizer use among autistic individuals with and without ID who present to a medical setting in crisis.

Methods: A retrospective chart review was performed on autistic individuals who presented to a neurobehavior consult service from 2019 through 2023. Clinical and demographic data were abstracted from clinical records including the Sources of Distress Survey (SDS). The SDS is a validated, web-based, adaptive questionnaire that queries caregiver observations related to psychiatric and medical conditions that may contribute to distress in individuals with neurodevelopmental conditions. Symptom modules include depression and expansive mood/mania, hereafter referred to as "mania" (See Figure 1). SDS queries depressive symptoms lasting ≥ 1 week over the preceding month and manic symptoms over the preceding 6 months that are distinct from baseline, last ≥ 2 consecutive days, and have no precipitating events. Descriptive statistics, Independent T-tests, Chi Square tests, and binary logistic regression adjusted for gender and age were conducted in SPSS Version 28 with an alpha of 0.05 selected to assess statistical significance.

Results: Of the 228 autistic individuals identified, 128 had ID (95 males, 33 females; mean=18.9 $\pm$ 9.3 years, range: 6-47 years) and 100 did not (66 males, 34 females; mean = 15.3 $\pm$ 8.0 years, range: 3-49 years). The presence of ID was associated with higher likelihoods of aggression (77% vs. 61%, $\chi^2(1,228)= 6.4, p=0.01$), self-injurious behavior (SIB) (63% vs. 34%, $\chi^2(1,228)= 18.2, p<0.001$), and antipsychotic and mood stabilizer use (75% vs. 52%, $\chi^2(1,228)= 13.0, p<0.001$; 52% vs. 22%, $\chi^2(1,228)= 20.7, p<0.001$, respectively). Autistic individuals with and without ID did not differ in the number of depression items endorsed (both mean=3.3 $\pm$ 2.3; $p=1.0$) nor positive screens on the depression module (both 73%, $\chi^2(1,228)=0.003, p= 0.95$). In contrast, autistic individuals with ID demonstrated a significantly higher number of manic symptoms (mean=2.1 $\pm$ 2.2; mean=0.9 $\pm$ 1.8, respectively, $p<0.001$) and greater likelihood of screening positive on the mania module (48% vs. 20%, $\chi^2(1,228)= 18.7, p<.001$). Sleeping six or less hours per night also occurred more frequently in those with ID (31% vs. 14%, $\chi^2(1,228)= 8.5, p= 0.003$). See Figures 1 and 2.

Conclusions: Frequent aggression, SIB, and antipsychotic/mood stabilizer use reflected higher crisis acuity among autistic individuals with ID. The presence of co-occurring ID coincided with higher rates of manic symptoms; however, depressive symptom frequency was remarkably similar between groups. Because psychotropic management of bipolar disorder differs substantially from unipolar depression, study findings demonstrate the importance of systematic screening for mania during crisis evaluations for autistic individuals, particularly when ID is also present.



438.131 Patterns of Parent-Child Concordance of Anxiety Symptoms across Multiple Diagnostic Groups Using the MASC-2: A Replication Study

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Background: Previous research indicates low to moderate agreement between parent and child reports of psychological symptoms (Bajeux et al., 2018), which has implications for diagnosis. Anxiety often co-occurs with autism, and previous work has suggested different patterns of parent-child concordance between autistic youth (ASD), those with co-occurring anxiety (ASD+ANX), and typically developing controls (TDC) on the Multidimensional Anxiety Scale for Children 2nd Edition (MASC-2; 2012), a widely used tool for evaluating anxiety in youth (Kalvin et al., 2020), but this work requires replication.

Objectives: Replicate findings of Kalvin et al. (2020) by examining parent-child ratings on the MASC-2 across ASD, ASD+ANX, and TDC.

Methods: 143 12-17-year-old participants were categorized as ASD, ASD+ANX, and TDC based on comprehensive evaluation supervised by a licensed psychologist. Clinicians completed the Ohio State Autism Rating Scale (OARS) to capture ASD symptom severity. Parents and children completed the MASC-2 Parent and Self-Report questionnaires. Parent-child discrepancy scores were calculated by converting Total Anxiety T-scores into z scores, and subtracting child anxiety z scores from parent anxiety z scores. Three major analyses were conducted to replicate Kalvin et al.: 1) Comparison of MASC-2 Total Anxiety T-Score across groups; 2) Comparison of parent-child discrepancy across groups, and 3) analyses of potential moderators of parent-child discrepancy (age, sex, IQ, autism characteristics).

Results: In replication of Kalvin, significant differences were observed in both parent and child Total Anxiety ratings between diagnostic groups, with highest anxiety ratings in ASD+ANX and lowest in TDC (Table 2). As in Kalvin, a significant group-by-rater interaction effect ($F(2,140)=6.24$, $p=0.003$) indicated that parent-child reporting discrepancies vary by group. However, the pattern of these discrepancies was different, with post hoc *t*-tests finding that TDC children rated their anxiety higher than their parents ($t(126.17)=-4.05$, $p<0.001$, replicating Kalvin), whereas there was no difference between parent and child ratings in ASD ($t(57.68)=0.92$, $p=0.36$, children>parents in Kalvin) or ASD+ANX ($t(89.57)=0.33$, $p=0.74$, parents>children in Kalvin). Correlations between parent and child ratings (Table 2) partially replicated Kalvin, with moderate relationships in ASD+ANX and TDC. Unlike Kalvin, which reported parent-child discrepancy was related only to autism severity, we found a significant association between parent-child discrepancy and IQ only (Table 2).

Conclusions: Overall, this study partially replicated Kalvin et al. Across parent and child report, we find a similar rank ordering of reported anxiety across ASD+ANX, ASD, and TDC. While we also found that the relationship between parent and child report of anxiety varied across groups, the nature of those differences was not consistent. We also did not replicate associations between potential moderators of parent-child reporting discrepancies. These findings support the conclusions that anxiety may be experienced and reported differently in ASD and that both parent and child report are useful, but discrepancies with prior work indicate the need for further investigation of the factors influencing parent-child anxiety rating discrepancies (e.g., sample differences, autism severity measure differences). For the project's presentation, we will extend Kalvin's study to two additional diagnostic groups (anxiety-only, and non-anxiety diagnoses; 155 additional children) and six additional MASC-2 subscales.

**438.132** Performance of Autism Diagnostic Tools in Preschoolers with Cerebral Palsy

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Background: Cerebral palsy (CP) is the most frequent motor disorder in childhood; movement, posture, and muscle coordination impairment may range from I (minimal support) to V (greatest support) on the Gross Motor Functional Classification System (GMFCS; Palisano, et al., 1997). Cohorts of children with CP have been found to have an autism prevalence of 3% to 16% (Craig et al., 2019). Most studies aiming to identify autism in children with CP have focused on school age children with CP (Pålman, 2021) but identification of autism in preschoolers with CP remains to be investigated (Rackauskaite et al., 2020).

Objectives: To describe the performance of two autism diagnostic tools, the Toddler Autism Symptom Inventory (TASI, for parent/caregiver report; Coulter et al., 2019) and the Autism Diagnostic Observation Schedule, 2nd ed. (ADOS-2, for direct observation; Lord et al., 2012) during autism diagnostic assessment in preschoolers with CP identified through screening or caregiver/teacher concern.

Methods: Sixteen children ($N_{\text{male}}=10$) ages 18-60 months, with CP underwent an autism diagnostic assessment, based on screening status or on caregiver concern. Demographic characteristics (age, sex, maternal education) were collected. Additional information included GMFCS classification of the children at the time of screening and co-occurring medical conditions. Autism diagnostic assessments included the administration of the TASI and ADOS-2 (modules Toddler or I), and a clinical estimate was established based on DSM-5 criteria. Scores from TASI and ADOS-2 were compared across nonASD (did not meet autism diagnostic criteria) and ASD (met diagnostic criteria) groups using a Mann-Whitney U test.

Results: All children had a GMFCS level between III and V. Scores for TASI were of 'Low likelihood' (<7 points) for two children, and of 'High likelihood' (≥ 7 points) for 14 children. ADOS-2 scores were within the 'Not consistent with autism' range for three of the children, and within the 'Consistent with autism' range for 13 children. Of the 14 and 13 children whose scores indicated likelihood of autism on TASI and ADOS-2, respectively, only four met diagnostic criteria for an autism diagnosis (ASD). The average score of the nonASD group on the TASI was 11.17 ($SD=4.43$), and 20.75 ($SD=5.50$) for the ASD group ($p=0.02$). The average score on the ADOS-2 was 13.75 ($SD=4.65$) for the nonASD group and 23.50 ($SD=5.69$) for the ASD group ($p=0.001$). Although TASI and ADOS-2 scores were above the cut-off on both groups, these correctly identified all four cases of autism, and the scores in the ASD group were higher than the nonASD group. However, both tools miscategorized most of the children who did not meet clinical criteria for autism ($n=10$, and $n=9$, respectively). Nine of these 10 children were miscategorized by both tools.

Conclusions: Autism diagnostic assessments using TASI and ADOS-2 in children with cerebral palsy will likely yield scores above the established cut-off. While these tools correctly identified children who met criteria for an autism diagnosis, potential modifications in scoring and cutoff points when administering to children with CP could lead to better accuracy in discriminating non-autism cases.

438.133 Physiological Responses to Stranger Approach in Autistic Children, Non-Autistic Siblings, and Neurotypical Peers: Insights into Early Social Fear

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Background: Autistic children are at elevated risk for social anxiety, which can lead to increased social avoidance and communication difficulties. Non-autistic siblings of autistic children (NA-Siblings) are also at elevated risk for social anxiety, due to environmental and genetic factors associated with autism. While early social fear has been shown to robustly predict later social anxiety in non-autistic (NA) children, much remains unknown about social fear in autistic children and NA-Siblings, especially in early childhood when preventative interventions could be most beneficial. Heart activity during the approach of a stranger can provide critical insight into the physiological mechanisms underpinning social fear in young children, as it reflects how the autonomic nervous system responds to stress in social contexts.

Objectives: To determine whether physiological responses during a stranger approach differ in autistic children and NA-siblings contrasted against NA children.

Methods: Participants included 39 autistic children ($M[SD]=3.72[0.65]$ years, 82% male), 20 NA-Siblings ($M[SD]=4.14[1.03]$ years, 60% male), and 30 NA children ($M[SD]=3.81[0.90]$ years, 76.6% male), ranging from 2-6 years of age. The groups were similar in age, $F(2,86)=1.69$, $p=.189$. Electrocardiogram (ECG) was measured during two tasks: (1) A baseline phase in which participants watched a five-minute animation; and (2) the Stranger Approach (SA) press of the Laboratory Temperament Assessment Battery, which consisted of three distinct phases: Approach, Kneel, and Withdraw. Two variables were derived from the ECG: (1) Interbeat interval (IBI), the time elapsed between consecutive heart beats, which indexes overall arousal; and (2) Respiratory sinus arrhythmia (RSA), the variability in IBI that corresponds with spontaneous breathing, which indexes parasympathetic regulation. Repeated measures ANOVAs were used to examine the effect of group, phase, and group*phase interaction on IBI and RSA. Bonferroni-corrected post-hoc analyses were conducted to identify specific differences.

Results: For IBI, significant main effects of phase, $F(3,258)=43.96$, $p<.001$, and group, $F(2,86)=3.29$, $p=.041$, were observed. The group*phase interaction was non-significant, $F(6,258)=0.78$, $p=.584$. IBI was shorter during the three SA phases than during baseline, $ps<.001$, but IBI did not differ between the SA phases, $ps\geq.90$. Autistic children exhibited shorter IBI than NA-Siblings and NA children, $ps\leq.015$. The NA-Siblings children exhibited longer IBI than the NA children, $p<.001$. For RSA, the main effect of phase was significant, $F(3,258)=18.48$, $p<.001$, but the main effect of group and the group*phase interaction were non-significant, $Fs\leq 2.82$, $ps\geq.064$. RSA was lower during all three SA phases than during baseline, $ps<.001$. RSA was lower during the approach phase than during the kneel phase, $p<.01$. All other SA phase differences were non-significant, $ps\geq.11$.

Conclusions: Findings suggest that autistic children exhibit heightened physiological arousal (i.e., shorter IBI) overall but normative patterns of IBI reactivity during a stranger approach, while NA-Siblings exhibit lower arousal (i.e., longer IBI) overall, highlighting distinct physiological profiles despite increased risk for social anxiety. Surprisingly, groups did not differ in parasympathetic regulation (i.e., RSA), and all groups exhibited the adaptive physiological response of RSA suppression when approached by a stranger. Future longitudinal studies should explore the long-term implications of physiological responses on the development of social anxiety symptoms.



438.134 Predictors of Aggression in Autistic and Non-Autistic Youth: The Role of Anxiety and Executive Functioning

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Background: Aggressive behaviors are prevalent among autistic children and are associated with social-emotional challenges (Reid et al., 2020). Aggression, anxiety, and executive functioning challenges often co-occur in autistic children but are usually examined separately (Sullivan et al., 2019). Further, aggression is typically studied cross-sectionally. Therefore, a longitudinal model that examines aggression alongside mental health is essential for understanding the trajectory of aggression.

Objectives: We investigated the relationship between anxiety, executive functioning, and aggression as predictors of later aggression measured 3 to 8 years later in autistic and non-autistic youth. As IQ and age correlate with aggression (Neumeyer et al., 2019), those were included as covariates.

Methods: Participants included 57 autistic (40% female) and 84 non-autistic (49% female) youth ages 8 to 17 years who participated in the GENDAAR study at both T1 ($M=12.82$, $SD=2.81$) and T2 ($M=18.17$, $SD=2.76$). The ACE GENDAAR network investigated sex and gender differences in autistic and non-autistic youth with average or above IQ. Separate models were run for autistic and non-autistic participants due to significantly higher levels of aggression in autistic participants at T1 ($t(209)=-9.63$, $p<.001$) and T2 ($t(89)=-5.05$, $p<.001$). IQ was assessed using the Differential Abilities Scale. Aggression and anxiety were measured using the age-appropriate form of the Achenbach System of Behavioral Assessments (Child Behavior Checklist or Adult Behavior Checklist). EF was measured using the Behavior Rating Inventory of Executive Function. Multiple linear regressions were performed to examine whether T1 aggression, anxiety, and executive functioning, controlling for age and IQ, predicted T2 aggression in autistic and non-autistic participants separately.

Results: Regression models were significant for autistic ($F(5,51)=11.08$, $p<.001$, $R^2=52\%$) and non-autistic ($F(5,78)=18.95$, $p<.001$, $R^2=55\%$) participants. For autistic participants, T1 aggression and anxiety were significant predictors of T2 aggression. For non-autistic participants T1 aggression, anxiety, and executive functioning were significant predictors of T2 aggression. See Table 1 for results.

Conclusions: Overall, findings suggest key group differences in predictors of aggression. Variability may arise from the distinct developmental trajectories and social experiences of autistic and non-autistic youth. Autistic youth face unique social challenges, including difficulty navigating social interactions, communication challenges, and sensory sensitivities, which may contribute to heightened anxiety and aggression. Conversely, challenges with executive functioning, (e.g., poor impulse control, difficulty regulating emotions) may contribute to aggression in non-autistic youth. These findings highlight the importance of tailoring interventions that target aggression to address the unique needs of each group. Future research should explore how predictors of aggression evolve and impact long-term outcomes. Additionally, investigating the interplay between anxiety, executive functioning, and aggression in more diverse populations could provide a broader understanding of these dynamics.



438.135 Predictors of Internalizing and Externalizing Behaviors Among Autistic Adults

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Background:

Co-occurring mental health conditions are more prevalent among autistic individuals compared to the general population. Yet, diagnosis and treatment of these conditions based on clinical practice designed for the general population often leads to uncertainties in the efficacy of identifying and targeting the specific needs of the autistic population. To reduce risk factors associated with mental health conditions such as suicidality among the autistic community, there is a critical need to understand the unique intersection of autism and mental health outcomes. The identification of predictors of mental health outcomes could inform the development of new assessments and interventions tailored to address the specific needs of the autistic community.

Objectives: To identify predictors of internalizing and externalizing behaviors among autistic adults to support their mental well-being.

Methods: 21 autistic adults (52.3% female), ages 18-29 ($M_{age}=23.22$ years) participated so far in this ongoing study. Diagnoses were confirmed using the Autism Diagnostic Observation Schedule and Autism Quotient (AQ). Cognitive skills were measured using the Wechsler Abbreviated Intelligence Scale ($M_{FSIQ}=117.57$). Participants completed the Adult Repetitive Behavior Questionnaire to measure repetitive behaviors and the Achenbach Adult Self Report (ASR) to measure adaptive functioning and mental health. Linear regression models were run to examine whether overall AQ, cognitive skills, and RRBQ totals contributed to internalizing and externalizing total and subscale scores from the ASR.

Results: For internalizing behaviors, AQ total scores significantly predicted internalizing total scores ($\beta=.787$, $p<.016$). Additionally, AQ predicted withdrawal subscale total scores ($\beta=.855$, $p<.001$); depressive total scores ($\beta=.629$, $p<.042$); and scores for the anxiety/depression subscale ($\beta=.698$, $p<.043$). For externalizing behaviors, none of the predictors showed statistical significance. Cognitive skills and repetitive behaviors were not related to internalizing or externalizing behaviors.

Conclusions:

These findings indicate that the presence of self-reported autistic traits predicts mental health outcomes such as levels of anxiety and depression. These results are consistent with what has been reported in previous studies, indicating that autism increases the risk of poor mental health outcomes. Various factors might explain this co-occurrence, including shared underlying mechanisms cutting across autism and mental health conditions, as well as distinct life experiences associated with being on the spectrum. Having autism and co-occurring mental health conditions might negatively impact long-term outcomes such as adaptive functioning, social skills, and risk of suicidality. Our analysis explored concurrent relations between mental health outcomes and autism features, cognitive skills, and repetitive behaviors; however, prospective longitudinal analysis will allow us to further examine these relationships over time. Additionally, we aim to include other potential predictors in a larger sample, such as psychosexual functioning and masking of autistic traits. Our findings may further the understanding of the intersectionality of autism and mental health conditions, which may inform intervention and diagnosis services to improve autistic quality of life.

438.136 Predictors of Satisfaction with Mental Healthcare for Autistic and Non-Autistic Adults

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Background: Autistic individuals experience high rates of mental ill-health and are over-represented amongst mental health service users. However, they often report dissatisfaction with their mental healthcare experiences. While research on improving physical healthcare for autistic people emphasizes improving accommodations for sensory and communication needs, limited mental healthcare research suggests other factors are important for positive mental healthcare outcomes, including the therapeutic relationship and practitioners' openness and knowledge about autism. **Objectives:** To identify the most important factors predicting satisfaction with mental healthcare for autistic adults (self-reported diagnosis: "D-Aut"; self-identified: "S-Aut") and compare these factors with those of non-autistic ("N-Aut") adults. We hypothesized all groups would similarly prioritize factors beyond accommodations as the main predictors of satisfaction.

Methods: Australian adults (N=426, M_{age} = 38 years, 72% female gender identity; D-Aut n=153; S-Aut n=134; N-Aut n=139) participated in an online survey about their mental healthcare experiences. Thirty-six items, developed from existing literature and advice from five autistic consultants, were categorized into four factors: Accommodations, Positive Practitioner Qualities, Knowledge, and Treatment Tailoring and Effectiveness. Participants rated their satisfaction with their most recent mental health practitioner and the 36 experience items using 5-point Likert scales (1=Very Low or Untrue; 5=Very High or True). Averages were calculated for each factor and groups were compared using Analysis of Variance. Standard multiple regression analyses were conducted to determine the significant predictors of satisfaction for the entire sample and within each group.

Results: Table 1 shows there were no significant differences in mean *Satisfaction* ratings between groups, with all mean factor ratings being similar across groups except for *Accommodations* where D-Aut gave significantly higher mean ratings than S-Aut. Table 2 shows all regression models were significant, explaining large proportions of variance in *Satisfaction*. For the entire sample, all four factors significantly predicted *Satisfaction* although *Accommodations* was a weak predictor. The significance and strength of predictors differed across groups. *Practitioner Qualities* was the strongest predictor for D-Aut and N-Aut groups, whereas *Treatment* was the strongest predictor for S-Aut, with *Practitioner Qualities* being a weaker predictor in this group. *Treatment* was also a strong predictor for D-Aut and N-Aut participants. *Knowledge* was a strong predictor for both autistic groups but was weaker for N-Aut participants. *Accommodations* was only a significant predictor for the S-Aut group but was a weak predictor.

Conclusions: Overall, participants reported moderate satisfaction with their practitioners. Across groups, all factors except Accommodations strongly predicted satisfaction. Notably, Treatment was the strongest predictor for the S-Aut group rather than Practitioner Qualities, and Knowledge was less influential for the N-Aut group compared to the two autistic groups, perhaps indicating that practitioners' knowledge about autism is crucial for autistic clients' mental healthcare outcomes. These findings suggest accommodations may be important pre-requisites for effective mental healthcare, but once provided, factors related to practitioner expertise, personalized treatment and therapeutic relationship quality are more important in determining satisfaction. Therefore, practitioners should focus on improving their knowledge, providing individually tailored treatments, and fostering strong therapeutic relationships to enhance satisfaction for all clients, whether autistic or not.



438.137 "My Answer Doesn't Fit Your Options": Measuring Self-Harm and Suicidality with Autistic Adults Using the Self-Harm Injurious Thoughts and Behaviours Inventory (SITBI)

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Background: Autistic people are a high-risk group for suicide and self-harm is one of the strongest predictors of death by suicide amongst autistic people. New tools have been validated to capture the suicidal experiences and meet communication preferences of autistic people, but there are no validated measures to assess self-harm. The SITBI is a widely used outcome measurement tool in clinical research about self-harm in the general population but has not yet been comprehensively validated in autistic people. There is currently no guidance for researchers to support autistic participants to complete questionnaires measuring suicidality and self-harm that are designed for non-autistic people.

Objectives: We aimed to describe the challenges reported by autistic participants when completing the SITBI and researchers' experiences of supporting them to provide recommendations for future research.

Methods: The final meeting with autistic collaborators of a pilot randomized controlled trial of autism adapted safety plans stressed the importance of collaborative research to explore how best to capture self-harm and suicidality in future trials. To address this, we undertook thematic analysis of 46 feasibility interview transcripts (participant mean age = 39, 49% female, 29% not male or female) from the final stage of data collection.

Results: As shown in Figure 1, we identified an overarching theme 'Identifying an authentic response: "My answer doesn't fit your options"' in which participants described working in trusting partnership with researchers to overcome ambiguous language and a lack of meaningful response options. Sub-themes described how these challenges extended into descriptions of autistic experiences of suicidal plans, suicidal ideation and self-harm. Firstly, the sub-theme 'Conceptualising suicidal experiences' described how questions about suicide plans required detailed definition to delineate plans from thoughts and actions. Secondly, the sub-theme 'Defining parameters of suicidal ideation' described how participants' frequent and enduring *suicidal ideation* made it difficult to calculate required numeric responses and items did not capture fluctuations in intensity in a meaningful manner. Thirdly, the sub-theme 'Capturing self-harm' describes participants seeking clarification whether self-harm within the SITBI includes instances of self-neglect, eating difficulties and autistic experiences such as stimming and meltdown.

Conclusions: Researchers should develop trust with autistic participants, validate their experience and work collaboratively to best fit experience to the available response options. Researchers can support participants by clarifying meaning of key terms, such as suicidal thoughts, suicide plans and self-harm and provide strategies to support participants to estimate numeric responses. Future research studies can work with autistic collaborators to decide the most valid approach to capture self-harm and suicidality experiences of autistic people depending on study design and aims. Future research could consider developing an autism-specific module to supplement the SITBI to capture autistic experiences of self-harm.



438.138 Relationship between Food Selectivity, Sleep Problems and Irritability in Autistic Youth

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Background: Problems with feeding, sleep and emotional reactivity have been independently described in autistic children and adolescents, and frequently occur at a higher rate in autistic youth than in their neurotypical peers. Yet, the relationship between these difficulties has not been well characterized. Better understanding of these relationships could pave the way for the development of additional and more comprehensive treatment strategies.

Objectives: Our study sought to examine factors associated with emotional reactivity in autism: specifically, focusing on the relationship amongst food selectivity, sleep problems and emotional reactivity.

Methods: Children and adolescents with autism ($N=27$, Age : 14.5, SD_{age} : 1.91, Range 11-17 years; 3.7% Asian, 3.7% Black, 7.4% Multiracial, 81.5% White, 3.7% Not Reporting; 7.4% Hispanic or Latino; 37% female; $IQ > 80$) were recruited for an IRB-approved study, conducted in the northeastern United States. Parents completed the Brief Autism Mealtime Behavior Inventory (BAMBI), Sleep Disturbance (Patient Reported Outcomes Measurement Information System [PROMIS]) and Sleep-Related Impairment (PROMIS) questionnaires, and the Emotion Dysregulation Inventory (EDI). Shapiro-Wilk tests of normality were used to assess the distributions of the following variables of interest: BAMBI food selectivity sum score, sleep disturbance PROMIS t-score, sleep-related impairment PROMIS t-score, and EDI emotional reactivity t-score. For normally distributed variables, Pearson correlations were conducted.

Results: The BAMBI food selectivity sum score was positively correlated with the sleep-related impairment PROMIS t-score ($r=.42$, $p<0.05$), but not with the sleep disturbance PROMIS t-score ($r=.27$, $p=.19$). The sleep disturbance PROMIS t-score and sleep-related impairment PROMIS t-score were each positively correlated with the EDI emotional reactivity t-score ($r=.63$, $p<0.001$ and $r=.52$, $p<0.01$, respectively). A positive correlation emerged between the BAMBI food selectivity sum score and the EDI emotional reactivity t-score ($r=.49$, $p=0.01$).

Conclusions: Our results suggest that more pronounced food selectivity and sleep problems are associated with more severe emotional reactivity in autistic youth. While our small sample size is a limitation, it is important that additional studies are conducted to evaluate (1) the relationship between problems with feeding, sleep and emotional reactivity in autistic youth; and (2) the direction of the effects (e.g., in longitudinal studies), which could help identify appropriate treatment targets.

438.139 Relationship between Sleep Disturbances, Sensory Sensitivities, and Anxiety Problems in Preschool Children with Autism Spectrum Disorder

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Background: Rest and sleep play vital roles in our daily lives, enabling us to function at our best. However, inadequate sleep quality can have adverse effects on children's development, impacting their behavior, learning, language, and immune systems. Children with Autism Spectrum Disorder (ASD) are particularly susceptible to sleep disturbances, with up to 89.7% experiencing such issues. Furthermore, sensory sensitivities are commonly observed in children with ASD and have been linked to emotional challenges. Previous studies conducted in the Western context have shown that sensory sensitivities and anxiety problems are frequently associated with sleep disturbances in preschool children with ASD.

Objectives: This study seeks to delve into the connections between sleep disturbances, sensory sensitivities, and anxiety problems in preschool children with ASD in Taiwan.

Methods: The study involved 47 preschool children with ASD, comprising 39 boys and 8 girls, who scored above 30 (mean = 32.8) on the Childhood Autism Rating Scale-Second Edition (CARS2-ST) and above 70 on the Peabody Picture Vocabulary Test-Revised (PPVT-R).

Caregivers were tasked with completing three questionnaires: Children Sleep Habits Questionnaires-Chinese version (CSHQ-C), Sensory Profile 2-short form (SSP), and Children Behavior Checklist, 1.5-5 years version (CBCL). Pearson correlation analysis was utilized to explore the relationships between sleep disturbances, sensory sensitivities, and anxiety problems.

Results: The results from CSHQ-C revealed that 97.9% of preschool children with ASD experienced a higher prevalence of sleep disturbances. The average total raw score in CSHQ exceeded the cut-off score of 41, indicating a mean total raw score of 57. Additionally, 80.9% of children scored higher than most people in sensory sensitivities, and over 61% of participants reported a moderate or severe level of anxiety problems using a cut-off score of 65. Significant correlations were found between sleep disturbances and sensory sensitivities ($r = 0.506$, $p < 0.001$), as well as between sleep disturbances and anxiety problems ($r = 0.524$, $p < 0.001$). Sensory sensitivities also demonstrated a moderate correlation with anxiety problems ($r = 0.594$, $p < 0.001$). Regression analyses revealed that children with sleep disturbances reported more sensory sensitivities and anxiety problems, with anxiety problems mediating the relationship between sensory sensitivities and sleep disturbances.

Conclusions: This study emphasizes the importance of considering sensory processing difficulties and sleep disturbances when addressing anxiety problems in preschool children with ASD. Anxiety problems act as a mediator, reducing the significant relationship between sensory sensitivities and sleep disturbances. Therapeutic interventions should consider the presence of sensory sensitivities and anxiety problems in addressing sleep disturbances among preschool children with ASD.

438.140 Relationship between a Gatekeeping Function during Sleep and Specific Sensory Issues in Children with Autism

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Background: Among the most common symptoms in patients with autism are sleep disturbances and sensory issues. Sleep disturbances are reported to occur in 50-80% of patients, and sensory issues in 60-90%, both of which are known to affect the quality of life of patients and their families. While disruption of sensory gating mechanisms in the thalamus has been proposed as a background for sensory issues in patients with autism, it is also known that the thalamus plays an important role in sleep-wake control. However, whether sensory issues and sleep problems in autism coexist on a common neural basis or whether a causal relationship exists between them remains to be clarified.

Objectives: This study aimed to evaluate the impact of sensory issues on sleep problems in patients with autism by assessing sleep disturbances in detail using subjective and objective measures.

Methods: Forty-eight patients with autism (10 Females; age: 9.9 ± 3.8 years; age range: 4-17 years) participated in the study. The Sensory Profile, 2nd Edition (SP-2) and Children's Sleep Habits Questionnaire (CSHQ) were used to assess sensory issues and subjective sleep problems, respectively. After a desensitization period of several weeks, ambulatory polysomnography (PSG) was conducted at each participant's home for an objective sleep assessment. Whole-night PSG data was obtained from 35 participants. PSG was scored using the American Academy of Sleep Medicine criteria, and regression analyses were performed to assess the relationship between SP-2 and sleep parameters.

Results: The major findings are summarized as follows. 1) CSHQ scores were positively correlated with scores from all SP-2 quadrants (Registration, Seeking, Sensitivity, and Avoiding) but particularly strongly associated with Sensitivity ($r=0.53$, $p=0.0001$). 2) In each sensory subsection of the SP-2, scores for touch, oral, and auditory processing were significantly correlated with CSHQ scores ($r=0.38$, $p=0.01$; $r=0.47$, $p=0.0007$; and $r=0.40$, $p=0.005$, respectively) 3) Among PSG sleep parameters, wake after sleep onset (WASO) was positively correlated with touch processing scores ($r=0.28$, $p=0.04$).

Conclusions: The strength of the correlation between sensory issues and sleep problems varied with the type of sensory property, indicating specific sensory issues may be related to sleep disturbances in patients with autism. Furthermore, PSG analysis results suggest that sensory issues are more strongly associated with difficulties in sleep maintenance than sleep onset problems, suggesting the disruption of the gatekeeping mechanism during sleep shares a common neural basis with sensory issues in autism. These results indicate that sensory issues are at least partly responsible for sleep problems in patients with autism and that interventions for sensory issues may improve sleep problems commonly observed in patients.

438.141 Self-Reported Factors Underlying Suicidal Thoughts and Feelings in Autistic People

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Background:

Suicide is a leading cause of death for autistic people worldwide, with lifetime prevalence of suicide ideation and attempts estimated at 1 in 3 and 1 in 5, respectively (Newell et al., 2023). While numerous correlates of suicidal thoughts and behaviours have been identified (Brown et al., 2024), understanding of the factors facilitating the ideation-to-action trajectory, which is essential for risk assessment and intervention, remains in its infancy. Since theories developed in neurotypical populations do not appear to operate equivalently in autistic people (Pelton et al., 2023), it is essential to examine autistic people's accounts and factors identified by those with experience of suicide ideation and attempts.

Objectives:

In a mixed-methods approach, we explored ratings of the most important contributing factors in a large autistic sample with different degrees of suicidal experience. Through thematic analysis of free-text responses, we hoped to derive deeper conceptual understanding of contributing factors. We examined whether ratings differed by age and gender, and whether self-reported contributing factors were useful predictors of varying levels of lifetime suicidality.

Methods:

Via an online survey designed with input from autistic people, autistic adults without intellectual disabilities (n=1369, 94% British) rated the importance of 19 pre-defined factors contributing to their suicidal thoughts and feelings, with some (n=544) adding their own factors. All participants (718 cisgender women, 326 cisgender men, 325 transgender/gender-divergent participants) had experienced some degree of suicidal thoughts, and almost 40% had attempted suicide at least once. Following thematic analysis of free-text responses, we compared ratings of contributing factors by age and gender, and used multinomial regression to examine contributing factors as predictors of lifetime suicidality.

Results:

Loneliness, feelings of worthlessness/failure, hopelessness and mental illness were consistently the highest rated contributing factors (Figure 1); analysis by gender suggested particular weighting to these factors by autistic women and gender-divergent individuals, and effects of age suggested hopelessness most strongly affected those aged 26-40. While qualitative responses (Figure 2) indicated contributions of some experiences and feelings identified as relevant to suicide in non-autistic people (e.g. abuse), being autistic appeared to heavily colour both the proximal stressors (e.g. societal rejection) and cognitive-emotional states (e.g. feelings of difference distancing one from other people) underpinning suicidal feelings. Greater importance of bullying, hopelessness, being unable to access support, mental health problems and past trauma differentiated between participants with different degrees of suicidal experience, while greater importance of difficulties accessing support and past trauma differentiated between participants with and without suicide attempts.

Conclusions:

Our findings offer three essential implications for suicide research, assessment and intervention. First, contributing factors for suicide differ by age and gender in autistic people. Second, while factors derived from autistic people's descriptions of suicidal experiences partially resemble those reported in neurotypical people, they differ in fundamental aspects, apparently augmented by common experiences and psychological differences associated with being autistic. Three, experiencing barriers to support and trauma appear as particular predictors of suicidal behaviour among autistic people.



438.142 Sex Differences in Social Anxiety Symptoms and Social Attention Among Children with and without ASD: Results from the Autism Biomarkers Consortium for Clinical Trials (ABC-CT)

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Background: Social anxiety is a common co-occurring condition with autism spectrum disorder (ASD) (Spain et al., 2018), and there is evidence of increased social anxiety symptoms (SAS) in girls compared to boys in both ASD and typically developing (TD) children (May et al., 2014). Increased social anxiety has been associated with atypical and increased initial attention to faces (Gregory et al., 2019). It has been shown that children with ASD show decreased attention to faces compared to their TD peers (Shic et al., 2022) and that ASD girls have increased attention to faces compared to ASD boys (Harrop et al., 2020).

Objectives: Explore the effects of SAS and biological sex on attention to faces using eye-tracking, based on two hypotheses: ASD-females exhibit higher SAS levels as compared to other groups and higher levels of social attention compared to ASD-males.

Methods: Children 6-11-years-old with ($n=280$) and without ($n=119$) ASD participated in a longitudinal observational study involving 3 visits with clinical measures and an eye-tracking battery. We evaluated the percentage of time spent looking at the actresses' faces, %Face, during the eye-tracking Activity Monitoring paradigm (videos and still images of two actresses engaging in a shared activity). We divided participants into high- and low-SAS based on symptom count (≥ 2 being high-SAS) as reported on the Child and Adolescent Symptom Inventory (CASI-5) during any visit. Chi-squared tests were used to evaluate proportional differences in SAS between Diagnosis-Sex groups. Linear mixed models evaluated %Face~Sex*Diagnosis and %Face~Sex*(combined SAS-Diagnosis) with covariates of IQ and age and random participant intercept. Due to its underpowered size ($n=2$), the high-SAS TD group was removed and the second model used combined SAS-Diagnosis group.

Results: Chi-squared tests showed that ASD-females had higher proportions of high-SAS as compared to ASD-males ($p=0.012$), TD-females ($p<0.001$), and TD-males ($p<0.001$) (Table 1). ANOVA of the first %Face model indicated main effects of Sex (females>males), Diagnosis (TD>ASD), and age (all $p<0.001$), and no interactions. ASD-females showed greater %Face than ASD-males ($p=0.037$) (Figure 1). ANOVA of the second %Face model indicated main effects of Sex (female>male), SAS-Diagnosis group (low-SAS TD>high-SAS ASD>low-SAS ASD), and age (all $p<0.001$), and no significant interactions. High-SAS ASD-females showed higher %Face than low-SAS ASD-females ($p=0.014$) and ASD-males with low- ($p=0.001$) or high-SAS ($p=0.015$), lower %Face compared to low-SAS TD-females ($p=0.003$), and no significant difference compared to low-SAS TD-males.

Conclusions: The results provide support for the existence of both Sex and Diagnosis differences on SAS and social attention and supported the two hypotheses. For ASD-females, having higher-SAS was associated with increased %Face compared to their ASD peers (male and low-SAS female). Yet TD-females showed higher %Face than TD-males even though they were low-SAS. Together, this may suggest mechanisms underlying increased %Face in girls with ASD may differ from that in TD girls. Future analyses could explore item-level scores to identify specific symptoms associated with increased social attention in girls with ASD.



438.143 Sex, Race, and Ethnicity Predict Patterns of Comorbid Autism Spectrum Disorder and Mental Health Diagnoses in Childhood and Adolescence

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Background:

Mental health disorders commonly co-occur with autism. However, the sequencing of these comorbid diagnoses has not been well studied. Given evidence for sociodemographic differences in rates of diagnosis and average age at diagnosis for both autism and numerous mental health disorders, patterns of comorbidity may differ across groups.

Objectives:

We investigated whether sex, race, and ethnicity impact the likelihood that a child receives an autism diagnosis before, after, or concurrently with a mental health diagnosis, and whether these factors impact the likelihood of receiving internalizing versus externalizing diagnoses.

Methods:

Data were extracted from the medical records of 3414 youth (959 girls). Children with diagnoses of both autism and a mental health disorder (i.e., mood disorders; anxiety disorders; disruptive, impulse-control, or conduct disorders; obsessive-compulsive disorder) were included. As the Benjamini-Hochburg False Discovery Rate correction for multiple comparisons was applied, q-values are reported.

Results:

Autism was diagnosed first for 39.1% of children. A mental health disorder was diagnosed first for 42.4% of children. Autism and a mental health disorder were diagnosed concurrently for 18.5% of children.

Sex predicted the sequencing of diagnoses ($\chi^2(2)=28.97, p<.001$). Girls were 1.37 times more likely than boys to receive a mental health diagnosis first compared to concurrent autism and mental health diagnoses ($q=.01$), and 0.64 times less likely to receive an autism diagnosis first than a mental health diagnosis first ($q=.005$). When mental health disorders were diagnosed first, girls were 1.79 times more likely than boys to receive an internalizing diagnosis ($q=.005$). Regardless of the sequencing of diagnoses, girls were diagnosed with autism on average 1.16 years later than boys ($q=.005$) and mental health disorders 0.67 years later than boys ($q=.005$).

Race and ethnicity also predicted the sequencing of diagnoses ($\chi^2(16)=31.91, p=.01$). Multiracial Hispanic children were 1.37 times more likely than White children to receive an autism diagnosis first than a mental health diagnosis first ($q=.03$), and 1.97 times more likely to receive an autism diagnosis first than concurrent diagnoses ($q=.005$). Race and ethnicity also predicted the likelihood that children would be diagnosed with an internalizing versus externalizing disorder when a mental health disorder was provided first ($\chi^2(8)=45.67, p<.001$). Black children ($OR=2.77, q=.005$) and multiracial Hispanic children ($OR=1.58, q=.05$) were more likely than White children to receive an externalizing diagnosis.

Conclusions:

Findings indicate that diagnostic patterns are associated with sex, race, and ethnicity. Girls are diagnosed with both autism and mental health disorders later on average than boys. Further, girls are more likely than boys to receive a mental health diagnosis, particularly an internalizing disorder, before an autism diagnosis, suggesting that the experience of anxiety and/or depression delays or overshadows the identification of autism in girls. Multiracial Hispanic children are more likely than White children to be diagnosed with autism first rather than a mental health disorder first or concurrent autism and mental health diagnoses, suggesting that mental health concerns may be overlooked in this population. Finally, results highlight significant racial and ethnic disparities in the likelihood that autistic children will receive an externalizing diagnosis.

438.144 Sleep Patterns of Children with a Family History of Autism Are Cyclically Associated with the Lunar Month

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Background: Our recent study indicates that during the days prior to the full moon human activity is extended into the nighttime in communities without access to electric light and, surprisingly, in young adults living in Seattle¹. During the nights prior to the full moon, sleep onset is delayed and sleep duration is shortened. This lunar modulation of sleep has been associated with switches between manic and depressive episodes in bipolar disorder patients^{2,3}. It is currently unknown whether the lunar regulation of sleep may represent a risk factor in other disorders associated with sleep dysfunction. In particular, sleep is impaired in autistic individuals, and disrupted sleep may, in turn, lead to greater impairments in functioning, but it is unknown whether this bidirectional relationship may be partially explained by the moon's effect on sleep.

Objectives: To test whether sleep-related outcomes are cyclically associated with the lunar month in children with a family history of autism.

Methods: Participants were 157 children between 7-12 years old with an autistic sibling (higher familial likelihood; HL n=102) or no familial history of autism (lower likelihood; LL n=55) from the multisite Infant Brain Imaging Study (IBIS) network. 31 HL children were diagnosed with ASD (HL-ASD). Participants wore an actimeter for 10 days. Sleep onset and duration were extracted from these recordings. We performed sinusoidal non-linear least squares models to test whether there was an association between these sleep variables and the day in the moon cycle in the HL-ASD, HL-noASD, and LL groups.

Results: We observed an association between the moon cycle and children's sleep patterns regardless of group (Figure 1), evidenced by the fact that the 30-day component of the fitted sinusoidal model showed a significant amplitude in all groups for both sleep onset (HL-ASD: $a=16\text{min}$, $p<0.001$; HL-noASD: $a=19\text{min}$, $p<0.0001$; LL: $a=26\text{min}$, $p<0.0001$) and duration (HL-ASD: $a=12\text{min}$, $p<0.0001$; HL-noASD: $a=11\text{min}$, $p<0.001$; LL: $a=13\text{min}$, $p<0.0001$). On average, variations through the lunar month (difference between maximum and minimum) were 44min for sleep duration and 68min for sleep onset. Interestingly, there were some differences in the shape of the sinusoids and the phase relationship between these two sleep-related variables and the moon cycle. For example, sleep duration was shorter during the full moon in non-autistic children, but autistic children showed shorter sleep duration during the new moon. Given our results, it is not clear whether moon cycle effects are disorder-specific, endophenotypic or familial.

Conclusions: These preliminary results show an association between sleep and the lunar month across all groups, regardless of diagnosis or familial history of ASD. This supports the idea that the lunar modulation of sleep may be conserved in typically developing children and those with neurodevelopmental disorders. Future studies are needed to determine the impact of the moon's modulation of sleep on children's functioning, and whether this impact is greater in autistic children than children with familial history of ASD or no family history of ASD. Understanding this effect could potentially reduce the cost and effort of sleep interventions by focusing on specific nights every lunar month.

**438.145 Social Anxiety Meets Social Virtual Environments: Perspectives and Adaptive Strategies of Autistic Adults**

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Background:

Social anxiety, or social phobia, is marked by a fear of negative evaluation, often resulting in avoidance behaviors triggered by perceived social threats (see: DSM-5-TR; APA, 2022). Recently, growing recognition of co-occurring mental health conditions with their own distinct symptoms (Renno & Wood, 2013) has helped address the issue of "diagnostic overshadowing" (Kerns et al., 2016). This awareness prevents these symptoms from being minimized or misattributed to broader neurodevelopmental diagnoses like Autism Spectrum Conditions. Moreover, it has been found that social anxiety is more prevalent among autistic individuals, with up to 50% affected (Spain et al., 2018). Importantly, studies show social anxiety can hinder outcomes in social skills training (Spain et al., 2017), while camouflaging behavior, which correlates positively with autistic traits (Hull et al., 2018), poses as a significant risk factor for mental health challenges among autistic adults without intellectual disabilities, with no observed moderating effects related to gender (Hull et al., 2021). Consequently, there is a need for the development of specific, validated assessment tools and targeted intervention programs. As noted by Acker and colleagues (2018), there remains a substantial gap in the literature regarding the lived experiences of anxiety among autistic individuals, calling for further exploration in this area.

Objectives:

The current exploratory study aimed to gather insights into how autistic adults engage in social virtual environments, with the goal of identifying key factors that could inform the development of a tailored virtual intervention to support the needs and preferences of autistic users as articulated by them.

Methods:

We first conducted desk research. Following, we applied an adapted PRISMA framework (Moher et al., 2009) to systematically identify, screen, and select our sample. This included thirty publicly available, self-generated content pieces from autistic individuals, comprising over 450 minutes of audio/video recordings and more than 1,500 written comments and materials from online platforms, such as forums like Reddit. PRISMA was chosen to ensure a structured and transparent process in gathering comprehensive data. We then analyzed the data using thematic analysis (Braun & Clarke, 2023) with a reflexive approach (Braun & Clarke, 2021), incorporating theoretical and investigator triangulation for robustness.

Results:

One of the sub-themes identified in this study, derived from the autistic VRChat user community, is the shared experience of social anxiety and the perception that the platform has helped many in alleviating these feelings (e.g., "it cured my social anxiety"). The findings also explored various social adaptive strategies that were self-reported by more experienced users to assist less experienced autistic individuals in navigating the online environments. These behaviors were categorized into over thirty distinct strategies, grouped into three main areas which provide interpersonal and communication insights in regards to digital, virtual and In-Real-Life social interactions.

Conclusions:

Future research should further investigate the potential of digital and virtual platforms as a clinical tool for interventions to alleviate social anxiety within the autistic population.

438.146 Social Anxiety in Autistic Adults: The Role of Mental Imagery and Fear of Negative Evaluation

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Background:

The Clark and Wells (1995) model of social anxiety (SA) underpinning cognitive therapy for SA proposes that fear of negative evaluation (FNE) from others and increased self-consciousness may result in individuals forming more negatively biased images of how one comes across to others in social situations. To date, the role of mental imagery in the maintenance of SA in autism remains poorly understood, especially when accounting for co-occurring generalised anxiety. Understanding maintenance mechanisms of social anxiety can inform treatment adaptations.

Objectives:

The following hypotheses were examined to explore the role of mental imagery in SA in autistic adults:

- Imagery will be more distressing in social versus relaxed condition
- FNE will be more positively associated with SA than generalised anxiety symptoms
- Greater SA and FNE may be associated with more distressing aspects of social imagery (e.g., upsetting, wanting to escape and greater anxiety elicited by the image)

Methods:

62 autistic adults (18-64 years; 35 female) recruited from social media and local autism services completed questionnaires online including Autism Quotient-10, Social Phobia Inventory, Brief Fear of Negative Evaluation Scale, Generalised Anxiety Disorder-7. Participants completed a structured Mental Imagery Interview (Hackmann et al., 1998) reported mental images in a relaxed versus socially anxious scenario. Participants rated the extent to which they experienced the image as vivid, controllable, realistic, upsetting, and making them want to escape, and how anxious they felt on a 0-10 scale. Friedman tests and Wilcoxon signed-ranks tests explored differences in imagery characteristics across social versus relaxed conditions (H1). Response Surface Analyses explored the extent to which: 1) assumed similarity in ratings of SA and GAD were associated with FNE, when controlling for autistic traits (H2); 2) assumed similarity in ratings of SA and FNE are associated with social imagery characteristics, when controlling for GAD (H3).

Results:

Participants self-reported a range of SA (M(SD): 34.18 (14.21)) and GAD (M(SD): 12.68 (5.57)) symptoms. Participants found social imagery more upsetting ($\chi^2(2) = 113.68, p < .001$), more likely to escape from/avoid ($\chi^2(2) = 90.70, p < .001$), more anxiety-inducing ($\chi^2(2) = 101.27, p < .001$), and less controllable ($\chi^2(2) = 35.49, p < .001$) compared to relaxed imagery (H1) (Table 1). FNE was significantly associated with both SA ($r = .56$) and GAD ($r = .40$) (H2). Greater SA was associated with wanting to escape from and experience of greater anxiety during social imagery. Greater GAD symptoms were associated with finding social imagery more upsetting and anxiety provoking. FNE was not associated with social imagery characteristics (H3) (Figure 1).

Conclusions:

The current study found that when controlling for generalised anxiety, only SA, not FNE, is associated with autistic adults finding social imagery to be more anxiety provoking and wanting to escape. For autistic adults, social imagery may be less associated with anticipated negative judgment from others, and more with general distress and bodily discomfort accompanying anxiety. Social imagery might maintain social anxiety in autistic adults through associated somatic and sensory discomfort, and related avoidance strategies, beyond FNE from others.

**438.147** Surveying the Diagnosis of Visual Impairment in Children with Autism

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Background: There is minimal empirical guidance for assessment or evidence-based interventions for children with autism (ASD) and visual impairment (VI) (Pili et al., 2021), particularly those with profound ASD and VI who have complex communication needs. Additionally, there is scarce research on the experiences of culturally diverse students and families impacted by ASD and VI comorbidities in the United States. Yet, blindness including total congenital blindness is a dominant risk factor for ASD (Jure et al., 2016) and is independent of other risk factors like cognitive disability and gender (Kiani et al., 2019). This pilot survey explored the diagnostic experiences of children with autism and visual impairment reported by parents and caregivers as a first step to examining the population's early assessment, diagnosis, and overall access to appropriate educational services.

Objectives: To identify factors impacting early assessment, diagnosis, and educational services among school-age children in Florida with dual ASD and VI.

Methods: The study is an exploratory pilot survey which used non-probability purposive and snowball sampling (Gay, 2011) to recruit parents/caregivers of school-age children with ASD and VI (ages 3-21 years) in the state of Florida to complete an on-line survey instrument developed by the presenter to identify factors contributing to the underdiagnosis of children with ASD and VI in the United States. Correlational analysis was used to determine the relationship between explored factors.

Results: The preliminary data presents findings on diagnosis and service experience of parents of children with ASD and VI in the state of Florida across **intersecting identities** (e.g., primary disability, race, ethnicity, gender), **culture** (e.g., language, custom, beliefs), **communication modes** (e.g., non-English-speaker, multilingual, augmentative alternative communication user), and **demographics** (e.g., geographic location, family composition) of **parents** and their **children** with ASD and VI. Our results show how these factors affect **special education eligibility, placement, performance, and the timeliness of services** for which the family and children qualify.

Conclusions: Researchers examining the prevalence of co-occurring ASD with medical and behavioral conditions routinely exclude visual impairment in their analyses (Soke et al., 2018; Cardinal et al., 2020). As a result, children with dual ASD and VI continue to be understudied, underdiagnosed, and underserved. The findings from this preliminary survey study contribute to a larger body of research aimed at identifying disparities and systemic barriers in services and support of children with co-occurring vision loss and ASD living in the United States. The collective data can then inform future efforts to reduce disparities in access to early intervention and appropriate family educational services.

438.148 The Anxiety Disorders Interview Schedule with Autism Spectrum Addendum: Inter-Rater Reliability, Convergent Validity and Discriminant Validity for Assessing Anxiety and ADHD in Autistic 4-8 Year-Olds

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Background:

Autistic children commonly experience co-occurring anxiety and/or ADHD. Complexities due to symptom overlap and distinct manifestations of symptoms of each condition in autistic individuals necessitate tailored assessment methods. The Anxiety Disorders Interview Schedule – Parent version (ADIS-P) with Autism Spectrum Addendum (ADIS/ASA; Kerns et al., 2024) is a diagnostic interview that was designed to (1) differentiate anxiety and autism, and (2) assess DSM specified (“traditional”) and unspecified (“distinct”) anxiety presentations, including fears related to social confusion, uncommon phobias, focused interests, and change. The ADIS/ASA has demonstrated inter-rater reliability and convergent / discriminant validity in 8–13-year-old autistic children (Kerns et al., 2017), and preliminary evidence indicates inter-rater reliability and convergent validity for assessing anxiety in autistic preschoolers (Vasa et al., 2024).

Objectives:

An important extension of existing work will be to incorporate supplementary interview probes that enhance differentiation of ADHD and autism into the ADIS administration (Davis et al., 2022), and to establish interrater reliability, convergent and discriminant validity of the ADIS/ASA for assessing anxiety and ADHD in 4–8-year-old autistic children.

Methods:

Participants were 93 autistic children aged 4-8 years ($M_{age}=73.00$ months, $SD_{age}=14.14$ months; $M_{DQ}=96.03$, $SD_{DQ}=16.63$; 31% females; 75% white) in an ongoing study exploring anxiety and ADHD in autism. Interviewers administered and scored the ADIS/ASA, including supplemental ADHD interview questions, while a second rater independently listened to and scored interview recordings. Parents also completed standard (Child Behaviour Checklist [CBCL], ADHD Rating Scale [ADHD-RS]) and autism-tailored (Parent-Rated Anxiety Scale for Autism Spectrum Disorder [PRAS-ASD]) behavioral questionnaires.

We calculated inter-rater agreement regarding diagnostic status (Prevalence-Adjusted, Bias-Adjusted Kappa; PABAK) and severity (intra-class correlation; ICC) for all assessed conditions. Correlations between clinician-rated anxiety and ADHD severity per the ADIS/ASA and parent-reported anxiety (CBCL Anxiety and PRAS-ASD) and ADHD symptoms (ADHD-RS and CBCL ADHD) assessed convergent and discriminant validity.

Results:

There was moderate to excellent inter-rater reliability for traditional (ICCs: 0.74–0.94, PABAK: 0.83-0.94) and distinct anxiety (ICCs: 0.66–0.86, PABAK: 0.91-0.98), as well as ADHD (ICC: 0.91, PABAK: 0.83) (Table 1). Convergent and discriminant validity (Table 2) were supported for ADIS/ASA traditional anxiety, distinct anxiety, and ADHD. ADIS/ASA traditional anxiety was more strongly associated with parent-reported anxiety than ADHD measures ($Z_s: 2.74–4.09$, $ps < .006$), and ADIS/ASA ADHD was more strongly associated with parent-reported ADHD than anxiety symptoms ($Z_s: 5.59–6.48$, $ps < .001$). ADIS/ASA distinct anxiety was also more strongly associated with parent-reported anxiety than ADHD ($Z_s: 2.05–3.09$, $ps < .04$).

Conclusions:

Findings support the ADIS/ASA – with additional probes for assessing ADHD symptoms woven into its administration – as a reliable and valid measure of anxiety and ADHD in autistic children during the pre-school and early school years, and demonstrate the measure’s ability to differentiate anxiety and ADHD symptoms. Used during this developmental period, the ADIS/ASA may guide accurate and early identification of autistic children with co-occurring mental health and neurodevelopmental concerns. This may aid clinicians in delineating and supporting autistic children’s needs, and facilitate research on the prevalence, development, and underlying mechanisms of co-occurring anxiety and ADHD with greater precision.

**438.149** The Impact of Anxiety on Emotional Dysregulation in Children and Adolescents with Autism Spectrum Disorder

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Background:

Approximately 70% of individuals with Autism Spectrum Disorder (ASD) present at least one comorbidity, with anxiety disorders being among the most prevalent (29%). Anxiety is associated with impairments in adaptive functioning, health, and quality of life, as well as emotional dysregulation. One behavioral problem strongly linked to emotional dysregulation in ASD is emotional outbursts, defined as highly emotional and explosive episodes characterized by challenging behaviors that vary across individuals and over time. Understanding the profiles of children and adolescents with ASD and anxiety, as well as the consequences for emotional regulation, is crucial for informing targeted interventions and support strategies. By identifying the interplay between anxiety and emotional dysregulation, practitioners can develop more effective therapeutic approaches that address both the psychological and behavioral challenges faced by these individuals, ultimately improving their overall well-being and quality of life.

Objectives:

To describe the frequency of anxiety episodes among children and adolescents with ASD, and to investigate the associations between the presence of anxiety and the type, frequency, and antecedent events of severe emotional outbursts.

Methods:

Sample: N = 193 children and adolescents (ages 8-16) with ASD. **Instruments/Data Collection:** Parents and caregivers were recruited via social media and responded online to Brazilian versions of two questionnaires: (1) Anxiety Scale for Parents of Children with ASD (ASC-ASD): This scale consists of 24 items with numerical values ranging from 0 to 3, where 0 = Never, 1 = Sometimes, 2 = Frequently, and 3 = Always. The total anxiety score, obtained through a simple sum of the items, can range from 0 to 72, with higher scores indicating greater anxiety levels. A total score ≥ 20 may indicate significant anxiety, while scores above 24 are more specific. (2) Emotional Outburst Questionnaire: This instrument contains 133 items divided into blocks of more and less severe topographies, based on parents' opinions, such as self-injurious behavior, aggression, verbal aggression, motor agitation, and physiological responses, among others. For each topography, three conditions are assessed: frequency, location, and antecedents.

This study was approved by the Mackenzie Ethics Committee (CAAE 29428620.4.0000.0084).

Results:

A high prevalence of anxiety (19%) was observed in this study sample. The most commonly reported severe emotional outbursts included verbal and physical aggression towards others, property destruction, and self-injury. These emotional outbursts were infrequent, occurring mostly less than once a month. The most frequent antecedents of these outbursts were children/adolescents being in a bad mood (61.3%), experiencing pain (47.2%), or feeling hungry or thirsty (40.6%). Interestingly, children and adolescents with anxiety were nine times more likely to experience emotional outbursts compared to those without anxiety.

Conclusions:

This study underscores the high prevalence of anxiety in children and adolescents with ASD and its link to emotional dysregulation, particularly severe emotional outbursts. The findings highlight the need for targeted interventions that address both anxiety management and contextual factors influencing emotional regulation, ultimately promoting better outcomes for this population.

438.150 The Impacts Associated with Autism: An Umbrella Review.

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Background:

Autistic people are at increased risk of experiencing a range of difficult life events. For example, up to 79% of autistic adults meet diagnostic criteria for a psychiatric condition at some point in their life, as well as an increased risk of a range of physical health conditions. However, there has not been a comprehensive synthesis of all the varying outcomes autistic people may experience.

Objectives:

To identify the outcomes and risks associated with autism which have been comprehensively studied in the research literature to date.

Methods:

A protocol for this review is registered with the International Prospective Register of Systematic Reviews (PROSPERO; CRD42023475389). An umbrella review was conducted. This involved conducting a systematic search of five databases (PsycINFO, Embase, Scopus, Medline, ERIC), to identify quantitative and qualitative reviews of any design exploring the impacts, long-term outcomes or risks associated with autism (including, but not limited to narrative reviews, systematic reviews (with and without meta-analysis) or scoping reviews). Searches were conducted with an unlimited start date up to 14th of January 2024. Qualitative and quantitative findings were aggregated into a narrative synthesis.

Results:

After duplicates were removed, 6079 records were screened for eligibility, with 133 records included in the final synthesis. 50 reviews covered mental health in autistic people. Results showed a significantly increased risk of anxiety and mood disorders, eating disorders, psychotic and personality disorders, substance misuse, suicide and self-harm. 62 reviews covered physical health in autistic people. Results showed consistent evidence for significantly increased risk of mortality, epilepsy, sleep disorders, obesity, feeding problems, gastrointestinal problems, poorer oral health, and atopic dermatitis, but not asthma, diabetes, impaired vision or hearing. 29 reviews covered social and lifestyle factors in autistic people. Results showed consistent evidence for significantly increased risk of body image and identity issues, bullying, victimisation and interpersonal violence, problematic gaming and internet use, lower quality of life, difficulties with relationships, social connection and sexual outcomes (such as behaviour, knowledge and education), but not offending behaviour and criminality. Many areas have not been extensively researched or have consisted of largely poor-quality research, precluding ability to make definitive conclusions regarding risk. For example, offending behaviour, diabetes, catatonia, incontinence, autoimmune disease, school absenteeism, ageing, and unemployment.

Conclusions:

Autistic people experience a wide range of negative outcomes covering mental and physical health and social and lifestyle factors. Many areas have not been comprehensively researched, despite negatively impacting autistic people's lives. Future research should focus on aiming to better understand and support autistic people experiencing these issues.

438.151 The Intersection of ADHD and Autism in Adulthood: Assigned Sex Differences in Symptom Profiles

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Background: ADHD frequently co-occurs with autism, yet understanding of ADHD in autistic adults is limited. Our recent large-scale study of Medicaid-enrolled adults found that 27% of autistic adults have ADHD, matching the prevalence rate observed in autistic children. ADHD symptoms in autistic adults are linked to less independence in activities of daily living and lower quality of life, highlighting the significant impact of ADHD on adult outcomes. ADHD is prevalent in both people assigned female and male sex at birth, but females are often underdiagnosed due to fewer visible symptoms of hyperactivity. We know little about sex differences in co-occurring ADHD symptom frequency and symptom profiles among autistic adults.

Objectives:

1. Evaluate sex differences in total ADHD symptom scores and positive ADHD screens among autistic adults
2. Examine sex differences in symptom profiles among autistic adults

Methods: 724 autistic adults (M=40.47 years; range: 18–83; 58% identified as assigned female) were recruited through the Simons Powering Autism Research (SPARK) Research Match service. Participants completed the 18-item Adult ADHD Self-Report Scale (ASRS), which assesses the presence and frequency of ADHD symptoms. We first compared total ASRS scores between assigned sexes using an independent samples t-test and then utilized chi-square analyses to examine sex differences in ADHD screen positivity rates (using Part A, which is the first 6 items from the ASRS). To analyze symptom profiles, we conducted a MANOVA, treating sex as the between-group factor and ASRS item-level scores as the within-group factor. Secondary analyses controlled for age and ADHD medication use to demonstrate the robustness of our findings.

Results: Autistic females reported significantly greater ADHD symptoms than autistic males overall (see Table 1), although screen positivity rates were similar: 48% for females and 43% for males ($\chi^2=1.65$, $p=0.20$). Profile analysis revealed that females scored higher across all ASRS domains. T-tests showed females had a mean difference of 2.94 points more than males on the total ADHD symptom scale ($t(722) = -3.096$, $p<0.01$) and 0.16 points more than males on the mean ADHD score ($t(722) = -3.102$, $p<0.01$). ANOVA confirmed a significant main effect of sex ($F(3,720) = 3.546$, $p=0.01$). Interactions between sex and age were non-significant. Findings remained significant after controlling for age and ADHD medication use.

Conclusions: Our study emphasizes the need to consider sex differences in ADHD among autistic adults. While both autistic males and females had similar ADHD screen-positivity rates, females reported significantly greater symptom frequency. ADHD symptoms are associated with worse adult outcomes, which means autistic females with ADHD may face greater challenges in daily life than autistic males with ADHD.

These findings highlight the necessity for increased clinical attention and effective treatment for ADHD in autistic adult females. Further research is needed to explore factors contributing to these sex differences, including coping strategies, social expectations, and diagnostic practices. Additionally, examining treatment response differences is crucial for developing tailored interventions for this population.

**438.152** The Prohibited Connection between Selective Mutism and Autism

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Background: An autism-diagnosis is an exclusion criterion for selective mutism (SM) in the ICD- 10 and 11. Still, studies show significant overlap between these conditions. The diagnostic manuals DSM-5 and ICD-10/11 have different approaches to the relationship between autism and SM, creating a challenge in the diagnostic process. In DSM- 5, there is somewhat broader acceptance of overlap between various conditions, including SM and autism (Muris & Ollendick, 2021). Contrarily, in ICD-11, autism is an exclusion criterion for the diagnosis of SM. This means that if a child shows clear signs of autism, they cannot be diagnosed with SM according to the criteria in ICD-11. This study challenges the diagnostic manuals' criteria for selective mutism regarding autism as an exclusion criterion.

Objectives: The purpose of this study was to explore diagnostic practices of the overlap between autism and selective mutism using data from the Norwegian Patient Register (NPR). Specifically, the aim was to quantify conditions (ASD, ADHD, Developmental Language Disorder, Social Anxiety Disorder, Social Phobia, Generalized Anxiety Disorder, Tourette Syndrome, and Major Depressive Disorder, with a primary focus on autism, and to address the gender distribution in this SM sample.

Methods: We identified a sample ($n=1,682$), aged 3 to 18 years in Norway, who during the period from January 1st, 2008, to April 30th, 2023, have had at least one documented episode where the diagnosis of selective mutism was registered in NPR. Diagnostic criteria followed the ICD-10 guidelines for selective mutism. The data were descriptively analyzed and presented using graphical figures showing the number of individuals with selective mutism with co-occurring autism diagnosis. Statistical analyses aimed to explore trends in co-occurrence, and analyzed the time interval between each diagnosis to assess how long it took for both diagnoses to be made.

Results: Many individuals have overlapping diagnoses of selective mutism and autism (11.7%). The average number of months before autism is registered after SM is -21.4 months, with a standard deviation of 40.93 months. The figure of -21.4 months is an average, and actual experiences may vary considerably. SM seems to be identified before autism in most cases.

Conclusions: Overlap between SM and autism can be challenging to detect in a school context if silence is very prominent. Like masking, the silence in SM may conceal the autistic characteristics at school but may be more evident in the home environment. It is important for healthcare workers and educators to know about SM, because starting intervention early leads to better outcomes (Rozenek et al., 2020), and the knowledge of causes, because like Cengher et al. (2021) indicates; children with both selective mutism and autism may be more challenging to give tailored help. As seen in our data, the overlap between selective mutism and autism is at 11.7%, despite the exclusion criteria in the ICD-diagnostic system.



438.153 The Relationship between Mental Health and Quality of Life for Fathers of Children with Autism and ADHD

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Background: Fathers' involvement in child-rearing positively influences children's developmental outcomes. Most investigations on parental quality of life (QoL) have been extensively conducted on mothers, including mothers of children with neurodevelopmental conditions. As a result there is an under-representation of fathers in studies of parental QoL, especially those raising children with neurodevelopmental conditions such as autism and ADHD.

Objectives: This study aimed to investigate the relationship between father mental health and neurodevelopmental traits, child neurodevelopment, emotional and behavioural factors, and socio-economic factors that influence the QoL for fathers of children with autism and/or ADHD.

Methods: Fathers of children with autism and/or ADHD (n = 105) completed an online questionnaire about their own mental health (BDI, BAI) and neurodevelopmental traits (SRS-2, ASRS), their children's autism (SRS-2), ADHD (Conners parent rating scale) and socio-emotional symptoms (SDQ), and socio-economic factors. Multiple regression analyses were conducted for father and child-related factors and ANOVA tests for the comparison of father's QoL (WHO-QOL) and socio-economic factors.

Results: Fathers with lower depression (Beta = -0.007 [95%CI -0.013, -0.002], p = .009) and anxiety symptoms (Beta = -0.013 [95%CI -0.022, -0.005], p = .003) predicted significantly greater QoL, whereas parent and child neurodevelopment traits, and socio-economic factors were not significant. QoL did not significantly differ between fathers of children with autism, ADHD, and co-occurring autism+ADHD.

Conclusions: Findings indicate that father's mental health is a strong predictor of their QoL. This highlights the need for clinicians to support the inclusion of fathers to enhance child-rearing engagement, individual and family wellbeing.

438.154 The Relationship of Camouflaging Strategies to Anxiety in Autistic Children and Adolescents

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Background: Autism is characterized by persistent alterations of social communication and interaction, as well restricted and repetitive behaviors. Camouflaging refers to a group of strategies used by an individual to diminish their autistic characteristics and appear less autistic in social situations. These strategies include masking (i.e., efforts to hide autistic characteristics); compensation (i.e., compensating for difficulties in social interactions such as social cuing and copying others); and assimilation (i.e., attempting to fit in with others in social situations including avoiding or forcing social interactions). Camouflaging has been shown to be related to poorer mental health outcomes in autistic people, with higher self-reported camouflaging associated with depression and anxiety, especially among autistic females.

Objectives: 1) To characterize patterns of camouflaging behaviors across autistic males and females; 2) to examine whether camouflaging behaviors predict clinical diagnoses of anxiety in autistic children and adolescents.

Methods: Participants included 28 primary caregivers and their children (ages 9–19 years; n = 12 females, 16 males) with a diagnosis of autism, confirmed using the ADOS-2 and ADI-R by licensed clinical psychologists. All participants were enrolled in an ongoing longitudinal study focused on neurobiological and behavioral development in autism, and data collection is ongoing. The Camouflaging Autistic Traits Questionnaire (CAT-Q) measures 3 domains of camouflaging: compensation, assimilation and masking. Parents were asked to complete the CAT-Q for children aged 9–13 (n = 19), while children aged 14–19 completed the CAT-Q as a self-report (n = 9). Clinical anxiety was diagnosed using the Anxiety and Related Disorders Interview Schedule for DSM-5 (ADIS) by a licensed clinical psychologist.

Results: There were no statistically significant differences in camouflaging behaviors between males and females, likely due to insufficient statistical power. Below, we describe the observed patterns in our small dataset that provide important initial descriptive information about our sample. Autistic females compared to autistic males displayed different patterns of camouflaging behaviors across the domains of masking, assimilation, and compensation. Autistic females reported more masking than autistic males (females M=26.83, SD=6.79; males M=24.67, SD=3.52), but less compensation (females M=27.83, SD= 7.63; males M= 36.00, SD= 3.46) and assimilation (females M= 29.17, SD=6.15; males M=33.67, SD=3.06) than males. These descriptive patterns were preserved across both parent- and child-report. Contrary to our hypotheses and prior literature, autistic males tended toward higher average CAT-Q total scores than females. Regarding associations with anxiety, 9 individuals met criteria for clinical anxiety. Results from a logistic regression indicated that assimilation may be the factor of camouflaging that most strongly predicts a clinical diagnosis of anxiety (p = 0.08).

Conclusions: Previous investigations into autistic camouflaging have focused specifically on autistic females. Although conclusions drawn from the present study are limited due to our small sample size, differential patterns of camouflaging behaviors that were observed between autistic males and females provides an important area of future examination. Future research should focus on differences between how camouflaging behavior presents in autistic males and females, which could provide insights into more effective, targeted and individualized supports through therapeutic or community approaches.

438.155 Agreement across Depression Measures in Adolescent Girls with and without Autism Spectrum Disorder

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Background:

Prevalence rates of depression among adolescent girls are on the rise (Daly, 2022), with autistic girls at even higher risk (Schwartzman et al., 2022). Assessing depression in autism is challenging given diagnostic overshadowing (Hinze et al., 2024) and the limited number of valid measures of depressive symptoms in this population (Pezzimenti et al., 2017). Clinicians often gather information on mood challenges from both the adolescent and their caregivers. While discrepancies in reporting depressive symptoms have been well documented in the general population literature (De Los Reyes, 2011), this phenomenon has not been well studied in individuals with autism. Given the challenges in diagnosing depression in autism, it is important to examine how well different informants and modes of information gathering agree with each other in the process of determining a diagnosis of depression.

Objectives:

To understand the level of agreement of reported clinical-range depression across measures, informants, and data collection modes in adolescent girls with and without an autism diagnosis.

Methods:

Ten adolescent girls with a diagnosis of autism and nine non-autistic girls between the ages of 13.8 to 16.8 years old ($M=15.1$, $SD=1$) were recruited to participate in a pilot study on social and emotional experiences (see Table 1). Inclusion criteria were assigned female at birth, identify as female, and had the ability to independently complete surveys and interviews. Adolescents completed the Beck Depression Inventory-II (BDI-II), the Center for Epidemiologic Studies Depression Scale for Children (CES-DC), and a clinical interview using DSM-5 criteria to assess symptoms of Major Depressive Disorder. Caregivers reported whether their child had formerly received a depression diagnosis from a professional and completed the Child Behavior Checklist 6-18 (CBCL), where the Internalizing Problems subscale was used in analyses. Frequencies of meeting the clinical cut-offs on the BDI-II, CES-DC, and CBCL internalizing problems were generated. Agreement of clinical range depression of the measures with each other, and the DSM-5-based clinical interview and reported clinical diagnoses were assessed using Cohen's Kappa.

Results:

For autistic participants, the CES-DC showed moderate agreement with the BDI-II ($k=.444$) and DSM-5 criteria ($k=.545$; see Table 2). The CBCL showed poor agreement with all other measures. The remaining measures showed fair agreement with each other.

Conversely, for non-autistic girls, we observed fair to substantial agreement for the CBCL with all the other measures. The CES-DC showed less agreement in the non-autistic sample compared to the autistic sample when examining agreement with the DSM-5 criteria ($k=.341$) and caregiver-reported diagnosis of depression ($k=.182$). The remaining pairings fell into the same agreement categories as in the autistic sample.

Conclusions:

The CBCL showed the worst agreement with other measures for the autistic sample, indicating that we should not solely rely on parent-report of internalizing symptoms when assessing for mood challenges in this population. This further supports that more research is needed on a larger sample of autistic adolescent girls to understand what factors may be contributing to the lack of agreement across raters and measures, and how we can accurately capture depression symptoms in this population.



438.156 Toilet Training Proficiency and Diaper Usage Patterns in Children with Autism Spectrum Disorder and Its Association with CARS Score

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Background: Although there are variations, children usually show readiness for toilet-training around 18-24 months and most children achieve day-time continence by 30-36 months. Along with the core deficits in social-communication skills and restricted/repetitive behaviour patterns, many kids with ASD have difficulties in achieving independence in daily-living adaptive skills, including toilet-training. As being toilet-trained is one of the most important functional goals, delays in the domain hampers child's independence and causes variable levels of parental stress.

Objectives: A study on various levels of toilet control and diaper usage patterns in 3-12 years old children and its association with CARS score.

Methods: The study was conducted in a semi-structured interview format with families of 205 children diagnosed with ASD. Detailed evaluation and CARS-2-ST scoring was done and data for urine & stool indication, diaper usage, willingness to sit on potty-seat, place of defecation was collected. IBM SPSS software was used for statistical analysis.

Results: The mean age for study population was 5.26 ± 1.80 years, with 82% males and 18% female children. 79% kids were in mild-moderate and 21% in severe range on CARS score.

40.0% kids indicated urine before passing, 29.8% after, 1.0% either before/after and 29.3% gave no indication. 19.0% of kids didn't use diaper, 18.5% at home, 27.8% outside home and 34.6% were always wearing diapers. 40.4% kids defecated in diaper, 47.3% in washroom and 12.2% in either washroom or diaper. 59.5% kids informed about potty need before defecation, 29.8% told after and 10.2% didn't indicate at all. 72.2% kids had no set-time for defecation. 25.4% kids were scared of sitting on potty seat. 62.9% did potty sitting/squatting, 19.1% standing and 18% either standing or sitting.

In pre-school age group, 43.8% didn't give prior indication for stool and 64.2% for urine. 36.5% were always in diaper and 26.3% were scared of sitting on potty seat. For school-age (6-12 years), 27.9% didn't give prior indication for stool, 50% for urine, 30.9% were always in diaper and 23.5% were scared of sitting on potty seat.

There was significant association ($p < 0.05$) of CARS-score with stool indication, timing of urine indication, place & position of defecation. The variable urine indication, diaper usage, set time for stool, child scared of sitting on potty seat were not significant. Gender was not significantly associated with any variable. Age group (pre-school/school-age) was significantly associated with diaper usage, place, timings and position of defecation.

Conclusions: Toilet-training is one of the most important ADL skills for functional independence. In our study, in school-age kids 50 % were not indicating urine & 27.9% stool in advance. There was significant association between CARS scores and toileting proficiency, with children with more severe autism symptoms being less likely to indicate their toileting needs.

The results emphasize the need for early, individualized interventions to improve toileting outcomes and reduce reliance on diapers. Further research is needed to explore the long-term impact of sensory interventions and parental involvement on toilet training success in children with ASD.



438.157 Apps and Digital Resources for Child Neurodevelopment, Mental Health and Wellbeing: A Review, Evaluation and Reflection on Current Resources

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Background: An increase in prevalence of neurodevelopmental conditions, such as autism, worldwide, alongside resource constraints within existing clinical assessment and diagnosis services, has led to increased interest in health information technologies, such as apps and digital resources. Digital tools are often viewed as a solution to bridge this divide and to increase supports for families. There is, however, a paucity of research that has evaluated digital health tools, their potential benefits for child neurodevelopment and associated concerns (e.g., mental health and wellbeing) and their benefit for families.

Objectives: The objective of this study was to conduct the first review of existing mobile apps and digital resources that are targeted at supporting the transdiagnostic needs of children with developmental concerns or neurodevelopmental conditions.

Methods: In this study, we identified 3435 separate resources, of which 112 (43 apps and 69 digital resources) met criteria. These resources were categorised according to their purpose or target, and were then reviewed based on their utility, information quality and evidence base using the Adapted Mobile App Rating Scale (A-MARS).

Results: The most common condition of concern targeted by apps and digital resources was autism (17%; 19/112 resources), with retrieved resources focusing on supporting challenging behaviours, promoting speech, language and social development, and providing options for alternative and assistive communication. Other common areas of concern targeted by apps and digital resources included language and communication (14.3%; 16/112) and ADHD (9.8%; 11/112). Results showed that reviewed resources were engaging, with high levels of accessibility and functionality. Resources had various functions, including developmental or behavioural tasks targeted at children, assistive communication support, scheduling support, journalling, and advice, activities and strategies for parents. The information quality of resources, such as credibility of source and evidence base was, however, mostly low. Mobile apps and digital resources that showed good credibility and had an existing evidence base were largely developed in partnership with research, health or government institutions, and were rated significantly higher on overall quality compared to apps and digital resources not developed in partnership with such institutions (mobile apps: $t(41) = -4.35, P < .001$; digital resources: $t(67) = -4.95, P < .001$).

Conclusions: The lack of evidence base across resources means that it is extremely difficult to provide recommendations to families with respect to apps or digital resources that may support their needs. Frameworks for the development of new tools are discussed, highlighting the novel approaches required to demonstrate efficacy of tools for improving outcomes for children and families. Such a framework requires collaboration with multiple stakeholders (software developers, researchers, regulatory bodies, clinicians, children and families) and engagement across multiple levels of expertise (app development, implementation and dissemination within services, policy and clinical regulations), to harness the potential of digital health for improving outcomes and promoting support in child neurodevelopment, which at this juncture remains largely underdeveloped.

438.158 Traumatic Experiences and Mental Health Among Autistic Children

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Background: Autistic children are more likely to experience trauma and poor mental health than non-autistic children. Autistic adults are more likely to report suicide-related behaviours and traumas related to education, victimization, and criminal justice. However, there are no large-scale studies that consider these types of traumas among autistic children.

Objectives: To explore whether autistic children are more likely to experience specific types of traumas compared to non-autistic children.

Methods: We administered a cross-sectional anonymized parent-report survey, which included questions on demographics, neurodevelopmental and psychiatric diagnoses, 44 different traumatic experiences, and the Mood and Feelings Questionnaire (MFQ), to measure autistic and non-autistic children's traumatic experiences and mental health outcomes. Our final sample included reports on n = 290 children (n = 196 autistic) aged 6-17 years. We used the Mann-Whitney U and chi-square tests to compare group differences, and Fisher's exact tests, unadjusted and adjusted binomial logistic regression models to compare the likelihood of each trauma between groups. All adjusted analyses controlled for type of education, country of residence, and sex. Adjusted models were fitted for 32/44 traumas due to perfect separation. To reduce Type I errors, the Benjamini-Hochberg method was applied.

Results: The sample was largely composed of children who were assigned male at birth, UK residents, and 41% of the autistic children did not attend mainstream schools (Table 1). Autistic children were more likely than non-autistic children to have two or more co-occurring neurodevelopmental and psychiatric conditions (46% vs 17%). Additionally, autistic children had higher levels of depression symptoms than their non-autistic peers (W = 5804, p = <0.001). A significantly greater number of parents of autistic children reported that their children had experienced 10/44 traumas. Parents of autistic children were more likely to report that their child had no friends at school, had been tricked or pressured into breaking rules or giving someone money or possessions, and was excluded from activities by their peers. Autistic children were also more likely to experience a mental health condition that affected their daily life, miss more than two weeks of school due to poor mental health, move school because the school was unable to cater for their needs, avoid school because it was too stressful, and self-harm. Additionally, parents of autistic children were more likely to report that their child had been refused additional support at school when requested. Full results are shown in Table 2.

Conclusions: This study bolsters existing evidence on the risks of trauma, poor mental health, and self-harm among autistic children and shows for the first time that autistic children are more likely to miss more than two weeks of school due to poor mental health, move schools due to unmet support needs, and be refused additional support at school upon request. Our findings highlight the importance of training for parents and teachers on how to best support autistic children experiencing trauma and mental health difficulties. These findings underline the importance of designing and implementing needs-based and trauma-informed mental health initiatives in all schools that focus specifically on supporting autistic children.



438.159 Treatment for Bowel Disease Improves Core ASD Symptoms in Children with ASD-Associated Enterocolitis

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Background: Chronic gastrointestinal (GI) symptoms, common in children with an autism spectrum disorder (ASD) diagnosis, are difficult to properly diagnose and effectively treat. The paucity of published information regarding specific therapeutic strategies and corresponding treatment outcomes in this unique patient population continues to complicate an already challenging situation. The treatment study described here was undertaken to address this information gap by providing a longitudinal assessment of the efficacy of standard-of-care treatment on GI symptoms and ASD characteristics in a group of GI-symptomatic children with ASD.

Objectives: The clinical effect of treating ASD-associated inflammatory bowel disease (IBD) has not yet been systematically evaluated, documented, analyzed, or reported. The objective of this study was to determine whether conventional treatment of IBD in children with ASD positively impacts both GI symptoms and core ASD behaviors and cognition. The overall goal of this pilot trial was to obtain data that would be exceptionally beneficial in generating a uniform "standard of care" for children with ASD who were being evaluated for chronic GI symptoms and shown to have treatable intestinal inflammation.

Methods: Following diagnostic assessment by a pediatric gastroenterologist and confirmation of eligibility (i.e., evidence of enterocolitis at endoscopy, capsule endoscopy, and/or biopsy), children with ASD were enrolled in the study and evaluated for one year during their ongoing treatment regimen which included induction corticosteroids followed by non-steroidal 5-ASA agents (and immunomodulators or biologics - as clinically warranted). Patient caregivers completed baseline GI symptom and ASD questionnaires at various time points over a 12-month period: at baseline just prior to treatment initiation, weekly (GI questionnaires; (1) Gastrointestinal Symptom Survey Bowel Movement Chart (GiSS-BMC), and (2) Gastrointestinal Symptom Survey Externalizing GI Behaviors (GiSS-EB)), quarterly (Autism Behavior Checklist (ABC)), semiannually (Social Responsiveness Scale (SRS-2)), and annually (Vineland Adaptive Behavior Scale II (VABS II)). Non-parametric Wilcoxon Signed-Rank Test was used to compare data between time points; $p \leq 0.05$ was considered statistically significant.

Results: Twenty-five participants completed the 52-week study. Average age of the participants was 134.48 (± 70.44) months (range = 29-338 months). The most frequently reported symptoms were abdominal pain (84%; 21/25), constipation (72%; 18/25), and diarrhea (52%; 13/25). The study population was predominantly Caucasian (N = 19; Asian = 3; Hispanic = 1; African American = 1; AA/Caucasian = 1). Although outcomes (i.e., magnitude of change) varied from individual to individual, data from all participants indicated significant improvements in both GI symptoms (**Figure 1**) and ASD behaviors and cognition (**Figure 2**) during, and following, one year of treatment.

Conclusions: This pilot study provides compelling preliminary evidence for the efficacy of standard-of-care treatment in children with ASD and co-occurring enterocolitis to improve both the gastrointestinal symptom profile as well as ASD-associated behaviors and cognition. Treating enterocolitis in children with ASD also improves core ASD features such as communication, socialization, and motor skills. This is perhaps the most exciting finding of the study because it implies that treating enterocolitis in individuals with ASD is a means of treating *autism*, not just gastrointestinal disease.



438.160 Understanding Self-Harm in Autistic Young People: A Scoping Review

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Background: Autistic young people are at increased risk of self-harm. However, existing literature on self-harm in autistic young people (aged 10 to 24) is limited and further research will be required to promote early identification and the development of effective intervention strategies for self-harm in autistic young people.

Objectives: This scoping review aimed to (i) generate an overview of current knowledge of self-injurious behaviour and self-harm in autistic young people, (ii) identify gaps in the literature and (iii) make recommendations for future research.

Methods: The literature search was conducted using Medline, Embase, PsychINFO, PsychArticles, Scopus, and Web of Science between March and June 2024. Research articles were included if they met the eligibility criteria for the scoping review.

Results: Fifty-four studies were included in the scoping review; one mixed-method and fifty-three quantitative. Of these, fifty-one examined self-harm in autistic people and three explored the relationship between autistic traits and self-harm. We present the findings in terms of (i) prevalence, (ii) associated factors, (iii) clinical outcomes and (iv) interventions for self-harm in autistic young people.

Conclusions: This scoping review highlights that although previous research has investigated self-harm in autistic young people, substantial gaps in knowledge still exist. Future research on this topic will need to address several methodological issues, particularly how to: (i) define and measure self-harm in autistic young people, (ii) produce findings that increase our understanding of self-harm and account for heterogeneity in the autistic population and (iii) use causal inference to identify risk and protective factors associated with self-harm in autistic young people. We discuss how to future research can address these challenges and inform the development of effective, evidence-based intervention strategies to support the mental health and wellbeing of autistic young people.

438.161 Understanding the Links between Age at Autism Diagnosis and Co-Occurring Mental Health: Insights from Autistic, Birth, and General Population Cohorts

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Background: Autism is marked by significant heterogeneity, but the role of age at diagnosis in explaining variability in co-occurring psychiatric conditions remains underexplored. Our previous research explored this axis of heterogeneity, identifying two differing epidemiological trajectories for early and late diagnosis.

Objectives: The present study examines how the timing of autism diagnosis, both epidemiologically and genetically, influences mental health outcomes across autistic cohorts, birth cohorts, and the general population.

Methods: In autistic children from **birth cohorts**, Millennium Cohort Study (MCS, N = 188), Longitudinal Study of Australian Children (LSAC) Baby Cohort (N = 125), and Kindergarten Cohort (N = 89), we used regression models to explore associations between previously identified trajectories for Strengths and Difficulties Questionnaire (SDQ) total scores and psychiatric outcomes, including mental health diagnoses and self-harm thoughts, adjusting for covariates. In MCS and ALSPAC, we evaluated the association between polygenic scores (PGS) for earlier and later diagnosed autism and trajectories of social, emotional, and behavioural traits.

In the **autistic cohort SPARK**, we assessed the relative prevalence of nine common mental health and neurodevelopmental conditions (e.g., ADHD, anxiety, depression) among autistic individuals over 9 years old. PGS based on iPSYCH GWAS for early- (before age 11) and late-diagnosed autism (after age 10). Regression analyses were performed to assess associations between these PGS and all the conditions, with controls for confounders.

Using genomicSEM, we analysed six minimally overlapping GWAS for autism, focusing on variations in age at diagnosis in **general populations**. Then we examined genetic correlations between these factors and mental health conditions and traits, such as depression and trauma.

Results: Late emergent difficulties trajectories were linked to higher rates of depressive symptoms ($P = 3.84 \times 10^{-4}$), anxiety ($P = 5.54 \times 10^{-7}$), and self-harm ($P = 0.018$), particularly in adolescence, reflecting higher internalising disorders in later-diagnosed individuals. Age-by-PGS interactions in MCS showed that PGS for later diagnosed autism was significantly associated with increasing emotional symptoms, peer problems, and SDQ total scores, while decreasing prosocial behaviours with age. In ALSPAC, PGS for earlier diagnosed autism was linked to decreasing hyperactivity/inattention.

In SPARK, we found different relative prevalence of conditions among autistic people diagnosed at different ages — anxiety and depression were more prevalent in later-diagnosed individuals. PGS for earlier and later diagnosed autism showed differing associations, particularly in mood disorders such as depression ($\beta = -0.08$, 95% CI [-0.131, -0.029], $P = 2.06 \times 10^{-3}$ for Autism_{earlierdiagnosed} PGS, $\beta = 0.045$, 95% CI [-0.006, 0.097], $P = 0.08$ for Autism_{laterdiagnosed} PGS).

Genetic correlation analyses showed later-diagnosed autism had larger genetic correlations with ADHD, depression, trauma, and self-harm. The genetic correlation between earlier and later diagnosed autism was moderate ($r_g = 0.38$, $se = 0.07$).

Conclusions: These findings collectively demonstrate that the profiles of co-occurring mental health conditions differ by age at autism diagnosis, with genetic differences partly explaining these variations. Understanding the complex socio-biological mechanisms linking genetics and mental health profiles is critical for future research.

438.163 Using Electronic Health Record Data to Understand the Impact of Co-Occurring Neurodevelopmental Conditions on the Timing of an Autism Diagnosis

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Background:

Autism commonly co-occurs with other neurodevelopmental conditions (NDCs), with over 95% of autistic children having at least one co-occurring condition, and up to 53% of autistic 4-year-olds having diagnoses of ≥ 4 co-occurring conditions (Soke et al., 2018). Common co-occurring NDCs include motor delay (MD), language delay (LD), global developmental delay (GDD), and attention-deficit/hyperactivity disorder (ADHD). While data regarding the high prevalence of individual co-occurring NDCs in autism are available (Maenner, 2021), little is understood about how having one or more NDCs may impact the timing of an autism diagnosis.

Objectives:

This study uses North Carolina Medicaid claims data to assess the impact of an NDC on the timing of an autism diagnosis.

Methods:

Using a cohort of children with Medicaid claims data from North Carolina in children who were born in 2014 with continuous enrollment (N=59496), we identified children who received an autism diagnosis (n=1540) by age 8. Of these children, we identified who had any of the four NDC diagnoses (n=1431), prior to the autism diagnosis. For all diagnoses, children had to have two distinct ICD codes on different service dates, with the first date used for diagnostic timing.

To test difference in timing of autism diagnosis, we age-sex-race matched each child with an NDC (case) to a child without the NDC (control) who had not yet received their autism diagnosis. We performed two-tailed paired *t*-test for mean difference of timing of autism diagnosis.

Results:

We found that children who received a diagnosis of MD, LD, and DD were more likely to receive their diagnosis of autism at an earlier age (p 's < 0.001). There was no significant difference in age at which children who were diagnosed with ADHD received a diagnosis of autism ($p=0.73$).

Results shown in Figure 1.

Conclusions:

Autistic children often receive a diagnosis of another NDC prior to their diagnosis of autism. These findings may hold relevance for considering a diagnosis of an NDC as a possible predictor of an autism diagnosis, which could potentially facilitate early identification and targeted interventions for autistic children. It is worth further understanding how early NDCs can facilitate making a timely autism diagnosis.



438.164 Comparative Longitudinal Actigraphy Analysis Shows Delayed Sleep Midpoint in Autistic Vs. Neurotypical Adults.

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Background:

Individuals diagnosed with Autism Spectrum Disorder (AUT) and Social Anxiety Disorder (SA), and co-occurring mental health concerns often face challenges that impact their sleep patterns, which can be indicators of more serious concerns affecting daily functioning and quality of life. Actigraphy is a low-invasive method for assessing physical activity and sleep patterns that has potential benefits for understanding health behaviors on a wide scale over long periods. This study aims to explore sleep midpoint, the middle time between sleep onset and wake in autistic vis-à-vis socially anxious and non-anxious neurotypical adults. The midpoint between sleep onset and wake time (sleep midpoint) has been identified as a predictive marker associated with an increased risk of depression and other affective disorders in other populations. A better understanding of these risk factors can contribute to increased detection and intervention.

Objectives:

The primary aim of this research was to evaluate sleep midpoint across three comparison groups of adults: diagnosed with autism (AUT), social anxiety but not autism (SA), and a non-anxious neurotypical comparison group (NT). We hypothesized that both the AUT and SA groups would have a significantly delayed sleep midpoint compared to the neurotypical comparison group.

Methods:

A total of young adult participants (74% female), including 30 with AUT, 23 SA, and 26 NT with no significant difference in FSIQ. Data were collected longitudinally across an average 115.92 days ($R = 30-234$, $SD = 53.75$). The sleep midpoint was collected using GENEActiv actigraphy devices and comparison was analyzed using linear mixed-effects models using R.

Results:

Sleep midpoint means were 5:30 AM (AUT), 5:12 AM (SA), and 4:36 AM (NT). Individuals in the AUT group had a significantly later sleep midpoint compared to the NT group ($\beta = 0.919$, $p = 0.0232$). No significant difference was observed between the AUT and SA groups ($p = 0.5614$), or between the NT and SA groups ($p = 0.2666$).

Conclusions:

This study shows significant differences in sleep midpoint between individuals with AUT and those in the NT group, with AUT exhibiting a later sleep midpoint. These findings suggest that significantly different sleep midpoints may indicate heightened sleep concerns and associated risks for mental health issues. Additionally, the average sleep midpoint of the SA group falls between the other two groups, suggesting that the AUT group faces additional factors that affect sleep. The low-invasive nature of actigraphy presents an opportunity to use sleep midpoint as an early screening tool for identifying individuals at risk within the broader population.

438.165 Variability in Suicidal Thoughts and Behavior Among Autistic Adolescents and Adults: Subgroup Identification, Predictive Features, and Group Differences

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Background: Autistic people experience high rates of suicidal thoughts and behaviors (STB) and are three times more likely to die by suicide compared to non-autistic people. Despite these alarming rates, there is substantial variability, and we lack understanding of who is the most at risk. Identifying subgroups of autistic people with varying levels of STB would improve prevention efforts and target those at highest risk.

Objectives: The study sought to: 1) identify and characterize STB subgroups of autistic individuals using a machine learning clustering method, 2) identify specific assessment items that predict STB subgroups.

Methods: The sample included 831 autistic adolescents and adults who participated in an online study as part of the University of Pittsburgh Autism Center of Excellence (age 37 ± 12 ; range 14-86). We applied a random forests clustering technique to item-level data from the Autism Suicidality Inventory (ASI), Columbia-Suicide Severity Rating Scale (C-SSRS), and Suicidal Thoughts and Behaviors Questionnaire (STUQ). Feature importance analyses identified which items were most informative for subgroup membership. Demographic (e.g. age, gender, food/housing insecurity), health (e.g. physical health, quality of life), and mental health (e.g. historical psychiatric diagnoses, emotion dysregulation (ED), depression, anxiety, masking) variables were examined to identify subgroup differences.

Results: The machine learning clustering algorithm identified five significantly distinct groups of STB risk, which varied both by suicidal thought severity and past attempt history (Table 1). Groups (G1-G5) range from lowest risk (G1: no current suicidal thoughts, 6.2% lifetime attempts) to highest risk (G5: 97% current suicidal thoughts, 62.5% reporting past attempts); G2 and 3 differ on current and past STB, while G3 and G4 share similarities in past but differ in their current STB. G5 had the most female-identifying people (41% vs. 19% in G1), the highest mean age (35 years), and the highest prevalence of psychiatric diagnoses. G5 also reported the most food and housing insecurity, physical pain, and health challenges. Groups also separated on levels of ED, anxiety, depression, with G5 having the highest severity. Further, high masking, low self-compassion, and feelings of inadequacy characterized G5. Across clustering measures, the STUQ item on frequency of suicidal thoughts contributed the most to STB subgroup clustering, followed by 19 ASI items (Table 2). Key ASI items included concerns of STB disclosure, social challenges and rejection, perseverative self-critical thinking, and social and emotional masking.

Conclusions: This study used new (ASI, STUQ) and established (C-SSRS) measures of suicidality to identify five distinct groups of autistic individuals with varying STB risk. Results highlight new areas to consider, such as food and housing insecurity, physical pain, and self-compassion, in addition to known correlates of STB in autism (e.g. masking and ED). The items that contributed most to STB subgroups highlight key targets for prevention and intervention, including understanding barriers to STB disclosure, social supports surrounding being rejected/excluded, alternative ED strategies, and fostering self-compassion. Future work should explore near-term increases in STB based on factors identified as contributing to risk. Finally, the multifaceted nature of subgroup contributors highlights the complexity surrounding STB in autistic people.



438.166 Why Am I like This? Exploring the Research Priorities and Experiences of Autistic People with Eating Disorders: A Photovoice Study**K. Buchan**, *Clinical and Health Psychology, University of Edinburgh, Edinburgh, United Kingdom***Background:**

Research has shown that Autistic people—or people with heightened Autistic traits—have an increased risk of developing eating disorders (EDs; Micai et al., 2023; Inoue et al., 2021). Despite this, little research has captured the deeper, qualitative nuances underlying this co-occurrence, and those that have are exclusively focused on the experiences of Autistic women with Anorexia Nervosa (Nimbley et al., 2023; Brede et al., 2021; Kinnaird et al., 2019; Babb et al., 2020). Consequently, it is unclear whether prior investigations have accurately captured experiences across Autistic presentation, gender, and ED type.

Furthermore, a failure to explore the research priorities of Autistic people with EDs has resulted in the exclusion of lived experience when shaping the academic landscape (Keller et al., 2024). Consequently, this has limited the clinical utility of findings by failing to produce research which is meaningful to the community. Therefore, it is imperative that research adopts accessible methodologies which facilitate inclusion of more heterogeneous samples to accurately capture the experiences and priorities of the Autistic ED community (Duffy et al., 2024; Cobbaert & Rose, 2023). To this end, we employed Photovoice, a flexible, participatory method which can empower lived experience voices, incite community change (Wang & Burris, 1997), and reduce neurotypical bias in autism research (Do et al., 2021).

Objectives:

To explore the experiences of Autistic people with EDs and set research priorities that are informed by the Autistic ED community.

Methods:

14 Autistic participants (M = 31.07 years, SD = 8.26; Table 1) attended focus groups held online or in-person. Groups met weekly for a period of 5 weeks, producing and sharing images that facilitated group discussions to co-produce meaning. Participants produced six titled images (three for experiences and three for research priorities) and provided written narratives that gave context to each image. Data from the image content, narratives, and workshops were analysed iteratively, using an adapted version of Wang & Hannes' (2020) question matrices and inductive-reflexive thematic analysis (Braun & Clarke, 2021).

Results:

Themes detected within Autistic people's experiences of EDs included an overarching theme of *Autistic Identity*, which underpinned themes: *The Overwhelm Bucket*; *Diagnostic Intersectionality*; *Go without me: Social Consequences of EDs*; and *Services and Support*. Five priorities for research were set by participants, including: *the Impact of Early Experiences*; *the Function of EDs*; *Barriers and Facilitators to ED Recovery*; *Understanding and Accommodating for Complexity*; and *Changing the Research Culture*. These informed preliminary research questions for future research (Table 2).

Conclusions:

Autistic Identity is central to participant ED experiences, showing that EDs are not merely characterised by Autistic traits, but rather how those traits are perceived by Autistic people operating within a wider neuronormative culture. Therefore, autism-affirming research / practice must extend conceptualisations of EDs beyond Autistic traits alone and account for deeper, qualitative experiences, particularly within areas highlighted as priorities by the community.

**438.167** “I Did Not Think They Could Help Me”: Understanding Autistic People's Reasons for Not Seeking NHS Support When Experiencing Suicidal Thoughts/Behaviours

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Background: Autistic people experience mental health challenges at higher rates than the general population, with estimates that 1 in 3 experience suicidal thoughts and 1 in 4 attempt suicide. It is likely that many autistic people who struggle with their mental health do not seek professional support. However, little is known about this group.

Objectives: To gain insights into why autistic people who experience suicidal thoughts/behaviours do not seek support from the UK National Health Service (NHS).

Methods: Autistic people in the UK with experiences of suicidal thoughts/behaviours were invited to complete a co-designed online survey from January-July 2024. Respondents who said they did not contact the NHS when they last experienced suicidal thoughts/behaviours were asked to share the underlying reasons. Respondents were able to select multiple responses from a list of 20 reasons and to share their own reasons as a free-text response. Descriptive statistics were used to characterize the sample and understand the most frequently endorsed reasons for not seeking support. These reasons were then compared across age groups (age < 25, 25-40, 41+) and gender (cisgender males, cisgender females, trans/non-binary) using analysis of variance.

Results: Of 1357 respondents who answered questions about help-seeking, 1002 (74%) did not seek help from the NHS. Among those who said why, the three most commonly endorsed reasons for not seeking NHS support were “I tried to cope and manage my feelings by myself” (50%), “I did not think they could help me” (44%), and “The waiting list is too long – no point” (39%). Notably, only 21% of respondents endorsed “I did not think it was necessary” and 0% endorsed “I did not want to be stopped”. In the analysis by gender (**Fig. 1A**), cis women were more likely to endorse that the “thought of talking about it was too difficult”, while both cis women and trans/non-binary respondents were more likely to endorse “previous negative experience when suicidal”, “negative experience with other health issues”, and “I could not face a doctor appointment”. In the analysis by age (**Fig. 1B**), younger respondents were more likely to endorse “I did not think it was necessary”.

Conclusions: Understanding why autistic people may not seek support during a mental health crisis is crucial for improving access to care and developing more inclusive, tailored support systems. Of the large number of autistic people who chose to complete our survey, the majority did *not* seek NHS support when experiencing suicidal thoughts/behaviours. The most commonly endorsed reasons reflect lack of confidence in existing services and barriers to accessing support (i.e. wait times), with previous negative healthcare-related experiences emerging as particular barriers for cisgender women and trans/non-binary respondents in our sample. While this survey provides the most comprehensive information to date about this understudied group, the findings are subject to sampling bias and may not be reflective of the overall autistic population.



438.168 Predictors of Suicidal Thoughts Among Young Autistic Users of a Mental Health App

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Background: Across all age groups, autistic people experience higher rates of suicidal thoughts and behaviours than the general population. While previous studies have identified various risk factors for suicidality among autistic adults, findings are more limited for autistic youth and typically rely on parent report or medical records, potentially overlooking important risk factors.

Objectives: To use self-reported data from young autistic users of a peer support mental health app in the UK to gain insights into factors associated with suicidal thoughts.

Methods: Autistic users of the Tellmi mental health app were invited to complete a 50-item survey co-designed with feedback from autistic people. In addition to reporting whether they experienced suicidal thoughts, respondents answered items related to (i) demographic characteristics, (ii) autism-related characteristics, (iii) adverse experiences/challenges, and (iv) co-occurring conditions. Descriptive statistics were used to describe the sample, and the chi-square test was used for comparisons between possible sub-groups. Binomial logistic regression was used to explore whether items from the above-mentioned four categories predicted suicidal thoughts.

Results: Complete data were available for 365 participants who believe they are autistic. The majority of participants were 11-16 years old (58%), cisgender female (54%), straight (72%), of white ethnicity (87%), and not eligible for free school meals (51%). A total of 122 participants had an autism diagnosis and 243 suspect they are autistic. As diagnosed and self-identifying participants did not differ in the frequency with which they experienced autism-related challenges (e.g., social interaction differences, communication differences, camouflaging/masking, repetitive behaviours, sensory differences, preference for sameness; all $p > 0.45$), they were analyzed as one group. The majority of participants (63%) reported that they experience suicidal thoughts, which is higher than the rate determined from a previous survey of non-autistic Tellmi users (51%). The binomial logistic regression results are presented in **Table 1**. Among demographic factors, gender non-conformity (i.e., identifying as trans, non-binary, gender questioning, etc.) and eligibility for school meals (as a proxy of socioeconomic status) were associated with a significantly higher odds ratio (OR) of suicidal thoughts. Among autism-related characteristics, requiring full-time care and higher reported levels of camouflaging were associated with suicidal thoughts. Among adverse experiences/challenges, experiencing hopelessness, family difficulties, physical abuse, and not wanting to attend school had a significantly higher OR of suicidal thoughts. Among co-occurring conditions, participants who experienced depression, bipolar disorder, and self-harm had a significantly higher OR of suicidal thoughts.

Conclusions: This study offers novel insights into factors associated with suicidal thoughts in young autistic users of a mental health app. Due to sampling bias, the findings may not be generalizable to all young autistic people. Despite these limitations, the findings suggest that established risk factors for suicidality extend to autistic youth (i.e., gender non-conformity, camouflaging, self-harm, depression, abuse, hopelessness), while identifying additional factors that may be unique to this group (i.e., family difficulties, higher care needs, not wanting to attend school). As suicidal thoughts typically precede suicidal behaviour, knowledge of risk factors could be applied to identify young people at high-risk and offer support.



438.169 A Transdiagnostic Exploration of Neurodevelopmental and Psychopathology Traits in Neurodiverse Children and Adolescents: Links to Adaptive Functioning and Quality of Life

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Background: Receiving co-occurring diagnoses across neurodevelopmental and psychiatric categories is commonplace for neurodivergent young people. When repeated patterns of co-occurring diagnoses arise, it raises concerns about the conceptual validity and utility of such categorical nosologies. Dimensional models of neurodevelopmental traits and psychopathology aim to address these concerns by characterising individuals along different spectra of transdiagnostic constructs.

Objectives: This study aimed to (a) develop a preliminary hierarchical model of autistic, ADHD, and psychopathological traits, and (b) explore the predictive utility of this model for adaptive functioning and quality of life outcomes, relative to the traditional DSM-5-TR categories.

Methods: The Extended BassAckwards procedure (Forbes, 2023) was applied to parent-report questionnaire responses of $N = 217$ neurotypical, autistic, ADHD, and AuDHD children and adolescents aged 6-18 years participating in the Monash Autism-ADHD Neurodevelopment and Genetics (MAGNET) Project based in Victoria, Australia. The questionnaires encompassed autistic and ADHD traits, anxiety, depression, and general emotional and behavioural wellbeing. The predictive validity of this transdiagnostic, dimensional model was compared against DSM-5-TR diagnoses with respect to the child's adaptive functioning (Vineland Adaptive Behaviour Scale) and quality of life (Child Health and Illness Profile).

Results: The model revealed a shared hierarchical relationship between autistic and ADHD traits with a common, higher-order 'Neurodevelopment' factor as well as a middle-order 'Withdrawal & Emotional Dysregulation' factor. Internalising and externalising phenomena were largely discrete from autistic and ADHD traits. The model was superior in predicting adaptive functioning and quality of life outcomes when compared to the DSM-5-TR diagnoses.

Conclusions: A dimensional understanding of autism and ADHD suggests potential aetiological overlap with aspects of emotional and behavioural regulation challenges. The personal and environmental contributors to these challenging experiences may represent a valuable treatment target for neurodivergent children, rather than solely focusing on their autistic and/or ADHD traits alone.

438.170 The Strengths and Difficulties Questionnaire As a Screening Instrument for Co-Occurring Mental Health Disorders in Autistic Children: An Explorative Study

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Background: The Strengths and Difficulties Questionnaire (SDQ) has been recommended as a mental health (MH) screening measure for children undergoing autism assessment to identify possible concurrent MH disorders. However, there is a notable lack of studies on the SDQ's ability to predict risk of disorder among children diagnosed with autism.

Objectives: Explore how the SDQ multi-informant algorithm agrees with the Diagnostic and Statistical Manual of Mental Disorders-Fifth Edition (DSM-5) based Kiddie-Schedule for Affective Disorders and Schizophrenia for School-Age Children (Kiddie-SADS) interview in identifying co-occurring MH disorders in autistic children.

Methods: The sample comprised 51 children and adolescents (age $M = 11.12$ years, $SD = 3.45$ years; full-scale IQ $M = 91.38$; $SD = 20.93$) who received an autism spectrum disorder diagnosis in the specialist health service. The majority (87%) were verbally fluent. The SDQ was completed by 51 parents, 16 adolescents and 39 teachers. In 45 cases both parent and teacher or self-report were available from the same families. Co-occurring MH diagnoses were based on the Kiddie-SADS interview conducted with parents, and the clinician conducting the interview was blind to the SDQ results. The main diagnostic groups (emotional, oppositional defiant disorder [ODD], attentional-deficit/hyperactivity disorder, and any disorders) were then compared to the SDQ scoring algorithm using two dichotomization levels: "possible" and "probable" levels. Sensitivity, specificity, positive predictive value, negative predictive value, and odds ratio were calculated.

Results: Sensitivity for the diagnostic categories was 0.30-0.73 ("probable" SDQ dichotomization level) and 0.68-0.84 ("possible" SDQ dichotomization level). Specificity was 0.80-0.90 ("probable" SDQ dichotomization level) and 0.38-0.73 ("possible" SDQ dichotomization level) (Table 1). Of the specific SDQ diagnostic algorithms, the emotional disorder algorithm showed an acceptable balance between sensitivity (0.74) and specificity (0.73) at the "possible" SDQ dichotomization level, followed by the oppositional defiant disorder (ODD) algorithm (sensitivity: 0.78; specificity: 0.69) (Table 1 and Figure 1). The SDQ any disorder algorithm performed adequate in terms of sensitivity (0.73) and specificity (0.88) at the "probable" dichotomization level.

Conclusions: In the clinic, sensitivity and specificity are important because these parameters indicate how many people with MH disorders the SDQ can correctly identify. In MH assessment of children using information from multiple informants is usually recommended. These results indicate that use of the SDQ multi-informant predictive algorithm shows acceptable sensitivity and specificity for the co-occurring diagnoses emotional disorder and ODD in mainly verbally fluent autistic children and adolescents. However, the sample was small, and more systematic attempts at validation are warranted, including examining the usefulness of the SDQ in combination with MH measures specifically developed for autistic children.

**438.171** Validity of the Psychopathology in Autism Checklist in Children with Autism Spectrum Disorder

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Background: The Psychopathology in Autism Checklist (PAC) is a measure developed for older autistic adolescents and adults for identifying co-occurring mental health problems. Item development was informed by diagnostic criteria and expert judgement of what represents four major mental health disorders in autistic people (psychosis, depression, anxiety disorder, and obsessive-compulsive disorder [OCD]). The factor structure of the PAC has not yet been examined in a child sample.

Objectives: To evaluate the factor structure and validity of the PAC in a well-defined sample of autistic children. We hypothesized that: i) a four-factor solution would emerge consistent with the original four disorder-specific subscales, ii) a three-factor solution omitting items belonging to the psychotic subscale, would provide the best fit in this child sample compared to the originally proposed four-factor solution.

Methods: The sample comprised of 171 autistic children ($M = 8.16$ years, $SD = 4.73$; girls = 32%; full-scale IQ $M = 86.42$, $SD = 19.53$) referred for an autism spectrum disorder (ASD) assessment in the specialist health service. We conducted confirmatory factor analyses (CFA) comparing the proposed four-factor model against a three-factor model omitting the psychotic items. Correlations between the PAC subscales and the Strengths and Difficulties Questionnaire (SDQ), Vineland Adaptive Behavior Scales (VABS-II) and demographic variables were examined.

Results: The CFA revealed adequate fit indices for the three-factor solution (see Table 1). All factor loadings were greater than 0.50, except for two items belonging to the depression subscale. The CFA for the four-factor solution revealed less-than-optimal fit indices (Table 1). Overall, the PAC subscales OCD, depression, and anxiety showed meaningful overlap and differentiation with the SDQ subscales, VABS-II, autism symptoms, full-scale IQ, and demographic variables (see Table 2).

Conclusions: The current study contributed to the field of mental health assessment by examining the validity of a screening measure developed for autistic people. Satisfactory structural validity was found for the PAC when omitting the psychotic items, in a sample of autistic children referred for an autism assessment. The findings support the use of the PAC subscales OCD, depression, and anxiety among autistic children for identifying co-occurring mental health problems in need of further assessment.



Poster Session

439 - Communication and Language II

May 3rd, 2025, 12:30 PM - 1:30 PM - Hall 4A

439.175 Finding Common Ground: The Power of Linguistic Entrainment in Matched Neurotype Communication

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Background: Recent evidence shows that matched-neurotype pairs communicate more effectively than mixed-neurotype pairs (Crompton et al., 2020; Oates et al., 2024). These dynamics occur, in part, because autistic individuals share a profile of pragmatic differences and a unique communication style that facilitates mutual understanding and connection, contributing to positive social experiences (Milton, 2012; Williams et al., 2021). One aspect of communication that has not yet been examined through the lens of double empathy is linguistic entrainment - the phenomenon in which communication partners gradually shift their speech and language to become more alike (Borrie & Liss, 2014; Garrod & Anderson, 1987). Greater convergence is strongly associated with increased rapport for neurotypical communicators (Borrie & Ivanova, 2021; Borrie & Liss, 2014; Gill, 2012). Because autistic people establish rapport differently than non-autistic people (Heasman & Gillespie, 2019; Rifai et al., 2022), we sought to analyze whether entrainment plays a role in the development of rapport among matched autistic pairs, and if so, whether it is correlated to the same extent as in matched non-autistic pairs.

Objectives: This study sought to investigate the extent of syntactic and semantic linguistic entrainment (i.e., increasing similarity over time) between communication partners with matched or mixed neurotypes; and secondly, to explore how these differences influence rapport development for communicators of different neurotypes.

Methods:

Thirty-three autistic adults and 37 non-autistic adults were systematically paired in either a matched-neurotype (i.e., matched non-autistic or matched autistic) or mixed-neurotype condition. Participants were blinded to their assigned condition. The pairs completed two structured communication tasks and a survey about the rapport they experienced in the interaction. The interactions were recorded, transcribed, and coded for syntactic and semantic convergence. Syntactic convergence was defined as change in MLU over the duration of the individual tasks and the full interaction. Semantic convergence was defined as the change in percentage of shared lexical items. Multiple team members conducted the transcriptions and coding for increased reliability.

Results: Initial analyses indicate that mixed-neurotype communication partners engaged in significantly less syntactic and semantic entrainment than matched-neurotype communication pairs. Moreover, syntactic entrainment contributed to rapport development for both non-autistic and autistic communicators in a similar manner, while semantic entrainment did not influence rapport for either group. Mixed-neurotype pairs reported significantly lower rapport than the two matched-neurotype pair conditions ($p=.023$), which did not differ significantly from one another.

Conclusions: Matched autistic and matched non-autistic communication partners are more likely than mixed-neurotype partners to adapt syntactic and semantic features of their language to one another. While matched non-autistic pairs used linguistic entrainment in communicative contexts that encouraged greater cooperation, matched autistic pairs tended to use it at least to some extent in all tasks. Both autistic and non-autistic communicators experienced boosts in interpersonal rapport associated with syntactic convergence. This innovative study underscores the importance of setting aside preconceived notions of autistic communication that are based on mixed-neurotype interactions. Furthermore, it contributes to the application of the double empathy theory to communication and introduces convergence as a unique pragmatic strength of autistic communicators.

439.176 Fine Motor Dexterity Associated with Vocal and Facial Affect Production in Autistic Youth

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Background: Previous research indicates deficits in gross motor coordination (e.g., arm movement, gait, and postural) are common in children with autism spectrum disorder (ASD; Fournier et al., 2010). These gross motor abilities have been associated with performance in other functional domains as well. Specifically, gross motor skills were found to significantly predict receptive and expressive language development (Bedford et al., 2016) and broad social skills, including adaptive social skills, social cognition, and social motivation (Wang et al., 2022). Further, impaired fine motor skills have been associated with poorer performance on tasks of articulation, receptive and expressive language and vocabulary, rapid naming, and parent report of functional and social communication skills (Simarro Gonzalez et al., 2024). However, associations between fine motor skills and specific aspects of social communication, such as expression of facial and vocal affect, have not been explored.

Objectives: This study examined associations between fine motor dexterity and vocal and facial affect production in children with ASD.

Methods: Participants included 58 autistic youth (33 males, 25 females), aged 8-17 ($M=12.27$, $SD=2.60$) who obtained a standard score of at least 80 on the Clinical Evaluation of Language Fundamentals-Fifth Edition (CELF-5) Core Language Index. This cut-off was applied to ensure participants were able to understand the narrative presented in one condition of the affect production task described below. Participants were administered a test of fine motor dexterity (grooved pegboard test) according to standardized clinical procedures and their performance was norm-referenced based on age (Knights & Norwood, 1980). Vocal and facial affect production were measured via a novel affect production task (Demopoulos et al., 2024). On this task, participants were prompted to produce a specific affective expression via either a monosyllabic or sentence-length utterance in response to an emotional narrative or without stated context. Audio and visual recordings captured their responses, and raters, blind to what expression the participant was prompted to produce were asked to identify the expressions. Facial and vocal ratings were performed separately. Accuracy was quantified by correspondence between the blinded rater's affective label and the emotion the participants were prompted to produce. Hierarchical linear regression analyses were performed in SPSS (version 29) to evaluate the relationship between dominant hand fine motor dexterity and vocal and facial affect production, after controlling for nonverbal intellectual abilities.

Results: After controlling for nonverbal intellectual abilities, dominant hand fine motor dexterity accounted for an additional significant proportion of the variance in vocal (R^2 Change=0.083, $F(1,50)=4.871$, $p=0.032$) and facial affect production abilities (R^2 Change=0.072, $F(1,54)=4.230$, $p=0.045$).

Conclusions: This study focused on the associations between fine motor skills and isolated social communication abilities, specifically vocal and facial affect production. Results indicated that better fine motor dexterity was associated with more effective facial and vocal affective communication in children with autism, after controlling for intellectual abilities. Facial expression and vocalization require coordination of many muscles within the face and vocal apparatus, respectively. These results may suggest that a common underlying difficulty in motor control may contribute to affect production difficulties that can be characteristic of ASD.



439.177 Gesture, Multimodal Communication, and Temporal Synchrony in Neurotypical and Autistic Children: A Microanalytic Exploration

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Background:

In typical development, infants frequently use multimodal communication, such as gaze, gestures, and speech, integrating these to capture caregiver attention (Goldin-Meadow, 2007). Multimodality is a key aspect of early communication (Iverson, 2010) and correlates with later language and social skills (Parladé, 2009; Rowe & Goldin-Meadow, 2009). In addition, temporal synchrony in these combinations serves as a powerful social cue for effective communication (Iverson, 2010). Previous studies indicate that children with an elevated likelihood of autism show a reduced use of multimodal combinations, such as gaze, gesture, and speech, during interactions (Parladé, 2015; Heymann, 2018; Choi, 2019; Wetherby, 2022), while, to the author's knowledge, temporal synchrony in gesture-speech combinations in very young autistic children during naturalistic parent-child interactions has not yet been explored. Our study aims to address this important gap.

Objectives:

We conducted a detailed micro-analysis of gesture-speech and gesture-gaze integration and their temporal dynamics in neurotypical and autistic children during naturalistic parent-child play interactions.

Methods:

The study included 28 neurotypical (NT) children (16 males) and 30 children (18 males) with an autism spectrum condition (ASC). The two groups were matched by the chronological age of the NT group (mean: 20.3 months, SD 5.7) with the developmental performance age of the ASC group (mean: 21 months, SD 8.3). We analyzed videos of naturalistic parent-child play interactions using a novel moment-by-moment coding scheme.

Our focus was on total gesture production—including deictic, representative-iconic, and conventional-interactive gestures—and its coordination with gaze shifts between the activity area and the partner's face, as well as the coordination of gestures with speech production.

Both measures were calculated as the proportion of gesture-gaze and gesture-speech behaviors relative to the total number of gestures produced by each child. Furthermore, we examined the temporal synchrony between gesture strokes and speech by calculating the proportion of gesture strokes aligned with speech relative to the total number of gesture-speech integrations.

Results:

ASC children exhibited a significantly lower total number of gestures than NT children ($U=179$; $p=0.0001$), a lower proportion of gestures integrated with alternate gaze ($U=205.5$; $p=0.01$) and reduced combinations of gestures with speech ($U=168$; $p=0.0027$). In addition, ASC children showed a reduced temporal synchrony between the gesture stroke and the speech ($U=114$; $p=0.024$, two-tailed) (fig.1).

Conclusions:

This micro-analytic study of early communication during naturalistic parent-child play interactions reveals that very young children with a clinical diagnosis of ASC coordinate gestures with alternate gaze and speech less frequently than their neurotypical peers, confirming previous findings in children with an elevated likelihood of autism. Importantly, this is the first report of reduced temporal synchrony between gesture strokes and speech in autism at such a young age.

By using a neurodiversity perspective, our study offers new insights into the multimodal communication profile of neurodivergent ASC children, enhancing our understanding of communication differences in autism. These findings support early detection and individualized, strengths-based interventions within a developmental framework.



439.179 How Do Virtual Communication Settings Impact Pragmatic Language in Autistic Adults?

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Background: Improving conversational use of spoken language is a common intervention goal for verbal individuals with autism, but there have been relatively few studies exploring discourse and dialog in autistic adults. Furthermore, we know little about how pragmatic language might be influenced by communication modality, which has grown increasingly important with the rise of the virtual workplace. To address these issues, we measure discourse features in autistic and neurotypical adults with low support needs as they engage in collaborative tasks with non-autistic peers. We explore these first in an in-person setting and later via a teleconferencing platform in order to better understand how communication modality impacts these discourse features.

Objectives: (1) To understand how communication modality (in person vs. teleconferencing) influences a speaker's overall degree of uncertainty, politeness, and informativeness. (2) To determine whether these discourse features are differentially impacted in autistic adults.

Methods: A subset of 10 adults (NT $n=5$, AUT $n=5$) from an earlier study ($n=25$) of in-person communication in autistic adults with low-support needs were invited to participate in a Zoom-based version of our earlier protocol. Each experimental participant (EP), autistic or neurotypical, engaged in a task requiring collaborative discussion with a designated conversational partner (CP). In this task, the EP and CP viewed maps of the same location with different roadblocks and labeled points, while the EP directed the CP to their location on the map. Each transcribed utterance was rated by two annotators on a 3-point scale for three discourse features: politeness, uncertainty, and informativeness. Cohen's kappa between the two annotators exceeded 0.8 for all three features. The average of the two RAs' ratings for each utterance was recorded as the final rating.

Results: In prior work with a larger group of EPs ($n=25$) in an in-person only setting, we noted a between-group difference in politeness, with utterances produced by autistic EPs rated as more polite ($p<0.001$). With this smaller subset, EPs did not show any significant between-group differences in politeness, uncertainty, or informativeness, whether in person or in the virtual modality. However, we did observe that autistic EPs were significantly less uncertain ($p<0.01$, $t=-3.608$) on average in the virtual modality (see Figure 1).

Conclusions: These results indicate that autistic adults with low support needs adjust their pragmatic language use when conversing via teleconferencing in ways that neurotypical individuals do not. There is prior work suggesting that autistic individuals may benefit from the reduction in sensory input streams afforded by virtual rather than in-person communication. The decrease in observed uncertainty when communicating on Zoom lend some support for these prior findings. We will continue to explore this phenomenon with additional as-yet unannotated data from a different collaborative task, as well as additional annotations of speech act labels.



439.180 Identifying Predictors of Language for Minimally Verbal Autistic Children Among Slow Responders to Initial Intervention
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Background: Minimally verbal (MV) autistic children continue to be an understudied population. These children's social communication skills can be complex and variable and there is a need for more tailored interventions for this population. Intervention studies have examined predictors of intervention outcomes, but few studies explore predictors for MV autistic children who are slow to respond to initial interventions.

Objectives: This study explored whether independently assessed nonverbal social communication behaviors at early response (Week 6) to exit predict children's language at the end of study among MV autistic children who were slow responders to initial intervention strategies.

Methods: Ninety-seven MV autistic children (M=73.07 months old, SD=14.76; non-verbal mental age of 35.7 months), average of 3.4 distinct words enrolled in this study across 4 sites. On average, these children were primarily male (83.5%), from diverse ethnic/racial backgrounds (46% non-Caucasian) with average ADOS severity scores of 7.43 (moderate-severe).

This is a secondary data analysis based on a multisite Sequential Multiple-Assignment, Randomized Trial (n=194). For this study, only data from children (n=97) who were considered slow responders to initial intervention at Week 6-Early Response were included. Assessments were collected at the major time-points: baseline, Week 6 early response, and Week-18 exit.

The Naturalistic Language Sample (NLS) is a 21-minute standardized, video-recorded, naturalistic adult-child interaction where socially communicative utterances (SCU) and the number of distinct word roots (NDWR) are the primary outcomes.

The Early Social-Communication Scales were administered by blinded assessors to assess children's social communication skills. The type and frequency of spontaneous initiations of joint attention skills (IJA) and behavioral requests (IBR) were coded as well as responding to joint attention request (RJA) and behavioral requests (RBR).

Regression analyses were used to determine the association between changes in child behaviors from early response to exit with child's language (SCU) at exit while controlling for site differences, child's age and gender.

Results: After receiving 6 weeks of initial intervention, these children remained as marked or severe (92.7%) in terms of their social communication skills at Week 6-early response. From Week 6 to exit, these children made significant improvements in their SCU (p=0.0215) with an average increase of 1.88 SCU (SD=7.81). Children's IBR and RJA at Week 6 were positively associated with increased SCU at exit (p=0.015 and p=0.016), but not IJA and RBR. Further, changes in children's IJA from Week 6 to exit is positively associated with increased number of NDWR from early response to exit (p=0.01).

Conclusions: Among these slow responders in either arm of the intervention, their IBR and RJA at Week 6 is positively associated with increased SCU at exit and their improvement in IJA is associated with gains in NDWR from early response to exit. The findings suggest that for this group of MV children who are slower to respond to intervention can continue to make significant improvement in their social communication skills with several children increased as much as 17-18 novel words. This suggests an increasing ability to express themselves more meaningfully and with greater linguistic diversity.

439.181 Impact of High-Fidelity Jasper Implementation on the Developmental Skills of Young Children with Autism

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Background: Early intervention approaches for young children with autism can be implemented in community classrooms with fidelity (Panganiban et al., 2022; Shire et al., 2017). Overall fidelity of program implementation has been associated with children's skills (Shire et al., 2017), however, the specific components embedded within these packages that may be driving child outcomes remain unclear.

Objectives: The current study was a secondary data analysis combining two previously published school-based intervention studies (Chang et al., 2016; Shire et al., 2017). The goal of this study was to determine if a) high fidelity and b) to which components of the intervention model (JASPER), were associated with differential child outcomes, including joint engagement (JE) and initiations of joint attention (IJA).

Methods:

Participants. Children (n=197) with autism aged 2-5 years (M=38 months; SD= 9.35 months) were included. Eighty percent of the sample were male participants and had diverse backgrounds (49% Hispanic, 19% Black, 15% White, 10% Mixed, and 7% Asian). Children in both studies were randomized to JASPER immediate treatment (IT) or school as usual waitlist (WL) for 3 months.

Intervention. Educators received training and in-vivo coaching with the research team to learn the JASPER intervention. In the IT group, educators implemented JASPER 30 minutes a day with their students for 3 months, while WL educators continued with standard school curriculum.

Teacher-child play interactions (TCX). Teachers' accurate implementation of JASPER was coded at entry and exit. Seven strategy sets were coded: Supports for Engagement and Regulation, Environment, Balancing Imitation and Modeling, Play Routines, Expanding Play Routines, Joint Attention and Requesting Skills, and Language Strategies. These strategies were examined within three subscales of strategy sets: Foundational, Core, and Advanced. Implementation fidelity for each set of strategies was split into high (70%+) and low (<70%).

Results: Regression analyses indicated that for JASPER classroom educators with high implementation fidelity of Core strategies at exit (>70%), the students demonstrated more time in JE (p=0.030) and more IJA (p=0.019) from baseline to exit. Strategy fidelity of Foundational and Advanced strategies were not associated with greater JE and IJA at exit.

Within the JASPER intervention group, the increase in implementation fidelity of Advanced Strategies from baseline to exit, was associated with increases in children's IJA (p=0.028), but not the other two strategies (p=0.065 and p=0.427). There were no associations between increase in fidelity implementation with increase in JE.

Conclusions: Educators' JASPER implementation fidelity is linked to children's progress in JE and JA. There was no signal that foundational strategies alone will impact children's outcomes. Rather, it is necessary to deliver high quality Core strategies to make changes in JE, the documented mechanism of change in JASPER intervention (Gulsrud et al., 2016). Further, the more complex Advanced strategies are required to advance higher level IJA skills. Future studies should examine strategies to better support educators in the implementation of the strategies (i.e., fidelity) to maximize outcomes for children with autism.

439.182 Infant and Caregiver Gesture Use and Language Abilities in Infants at Elevated Familial Likelihood for Autism from India
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Background: Gestures are key developmental milestones that support communication and language in infants. Infant siblings of autistic children, at elevated familial likelihood for autism or related neurodevelopmental disorders (EL-A), tend to use fewer gestures than typical likelihood (TL) infants, potentially affecting their later language development.^{1,2} However, gesture use may vary across cultures and is yet to be systematically studied in non-Western contexts like India. Although research indicates EL-A infants receive differential caregiver verbal input compared to TL infants,³ gesture input remains understudied.

Objectives: To investigate (a) early gesture use in EL-A and TL infants, (b) caregiver gesture use with EL-A and TL infants, and (c) association of (i) infant and (ii) caregiver gestures use, with concurrent infant language abilities

Methods: Six-minute caregiver-infant free-play videos were collected from 33 EL-A ($M_{age}=11.65\pm2.04$ months, 13F) and 15 TL ($M_{age}=12.75\pm2.12$ months, 9F) dyads. Directed gestures from caregivers and infants were coded by three trained reliable coders using EUDICO Linguistic Annotator (ELAN v.6.8) software, following a coding schema developed for gestures (GC) and gesture-speech combinations (GSC) (see Figure 1). Annotation frequencies were compiled, and total gestures types (GT) was computed. Non-parametric Quade's ANCOVA controlling for infant age was used to investigate gesture use between the groups and partial Spearman's correlations adjusted for age was used to assess association between gesture use and language.

Results: Table-1 depicts descriptive data for infant development. EL-A infants used significantly fewer deictic gestures ($F=4.41, p=.042$),² gesture types ($F=21.21, p<.001$) and gesture initiations ($F=25.74, p<.001$)⁴ compared to TL infants. Conversely, EL-A caregivers provided more GSC ($F=5.13, p=.028$), and initiated more gestures ($F=6.69, p=.013$) than TL caregivers (Table 1). While EL-A caregivers showed significant preference for reinforcing gestures ($F=17.33, p<.001$), TL caregivers used significantly more disambiguate gestures ($F=10.54, p=.002$), possibly reflecting their efforts to engage/maintain their infants' attention⁴ or following practices learned through interventions for their older autistic child.

In the overall sample, following positive moderate associations were observed between infant gestures and language abilities: GT with both receptive ($p=0.37, p=.01$) and expressive language ($p=0.37, p=.009$) on VABS and MCDI early gesture ($p=0.38, p=.009$); initiation with VABS receptive language ($p=0.4, p=.005$) and MCDI early gesture ($p=0.41, p=.004$) (Figure 2). These findings reinforce a link between infant gesture use and language abilities.¹ However, deictic gestures ($p=0.31, p=.033$), GC ($p=0.3, p=.045$), and gesture responses ($p=0.42, p=.004$); were negatively associated with MCDI expressive vocabulary. This direction of findings was unexpected and needs to be explored further at later ages with stabilized verbal repertoire (i.e., >24months).

Surprisingly, caregiver GC was negatively associated with VABS receptive language ($r=0.32, p=.03$) and gesture initiation was negatively associated with MCDI expressive vocabulary ($r=0.41, p=.005$) and early gestures ($r=0.29, p=.048$). These findings suggest caregivers may compensate by using more gestures with infants who have difficulty in understanding them and initiating more with less expressive infants.

Conclusions: This is one of the first studies exploring infant and caregiver gestures use in EL-A dyads in a non-Western context. Observed findings highlight the importance of monitoring infant gesture use and including this as a target for early intervention programs. Larger longitudinal studies are required to further investigate present findings.



439.183 Lexical Processing in Autistic Children: Associations with Word Learning, Vocabulary, and Cognition

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Background:

Looking-while-listening (LWL) measures real-time lexical processing by presenting two images on a screen and quantifying the extent to which a child directs their eye-gaze to the visual stimulus that matches an auditory one (Fernald et al., 2008; Venker & Kover, 2015). In autistic children, Venker et al. (2013) found relationships between LWL performance, vocabulary, and nonverbal cognition, but only examined familiar words. Haebig et al. (2017) found associations between LWL performance for recently taught novel words and vocabulary size in autistic children, but not between nonverbal cognition and word learning. Recently, Ronfard et al. (2022) demonstrated associations among LWL familiar word processing, novel word learning, vocabulary, and cognition in neurotypical toddlers. The current study extends this research with an LWL task that taps both familiar and novel words in older autistic children.

Objectives:

We address whether individual differences in LWL performance for familiar words are associated with LWL performance for novel words, vocabulary size, and nonverbal cognition among autistic children.

Methods:

Participants were autistic 3- to 11-year-olds ($N=29$) who completed an LWL task (Fernald et al., 2008). Auditory stimuli included both short (1-syllable) and long (2-syllable) words, with familiar and novel words interspersed. Trial order, target side, and label-object pairings were counterbalanced. Visual stimuli were color images of unfamiliar objects (Law & Edwards, 2015) and familiar objects of similar size and complexity.

Accuracy for each trial was calculated as the proportion of time spent looking at the target (as opposed to the distracter). The test window was defined as 267ms-3500ms after target word onset. Trials were excluded when less than 50% of gaze in the test window was to the images; participants were excluded when contributing fewer than 3 trials of a given task segment. To yield familiar and novel word accuracy, performance was collapsed across word length because accuracy did not differ between short and long words ($p>.34$).

Receptive and expressive vocabulary were characterized with Peabody Picture Vocabulary Test (PPVT-4) and Expressive Vocabulary Test (EVT-2) growth scale values. Nonverbal cognition was assessed using the Leiter International Performance Scale (Leiter-3). See Table 1.

Results:

Accuracy for familiar and novel words statistically exceeded chance (i.e., .5; $M_{\text{Familiar}}=.70$, $SD=.14$; $M_{\text{Novel}}=.61$, $SD=.14$). Familiar word accuracy significantly exceeded novel word accuracy, $t(27)=3.32$, $p<.01$. See Figure 1. Using Pearson's correlations, familiar word accuracy was positively correlated with novel word accuracy, receptive and expressive vocabulary size, and nonverbal cognition ($p<.01$). Partial correlations controlling for age yielded the same conclusions.

Conclusions:

Similar to Ronfard et al.'s (2022) findings for neurotypical toddlers, familiar word processing was associated with novel word processing, vocabulary size, and cognition among autistic children, pointing to LWL familiar word accuracy as reflective of a broader set of developmental skills, as well as the utility of LWL for assessing novel word learning in this population. Next steps include examining response time and lexical characteristics, such as phonological neighborhood density, as they relate to lexical processing for familiar and novel words for autistic children.



439.184 Investigating Gesture-Speech Integration Impairments in Autism: An fNIRS Study

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Background:

Gesture-speech integration is a fundamental aspect of human communication, and disruptions in this multimodal process are frequently observed in individuals with Autism Spectrum Disorder (ASD). Prior research has identified atypical neural responses to multimodal stimuli in ASD, particularly in inferior frontal gyrus (IFG) and posterior superior temporal sulcus (pSTS), two key brain regions subserving language and social communication. However, the neural mechanisms underlying these disruptions in speech processing, specifically during gesture-speech integration, remain poorly understood. This study addresses this gap by examining neural activation in children with ASD during tasks involving unimodal gesture and speech processing and congruent and incongruent gesture-speech pairings.

Objectives:

The objective of this study was to identify the neural correlates of gesture-speech integration in children with ASD using functional near-infrared spectroscopy (fNIRS). Specifically, we aimed to identify differences in hemodynamic responses of IFG and pSTS across four experimental conditions: 1. Congruent gesture-speech pairings; 2. incongruent gesture-speech pairings; 3. gesture only stimuli; 4. speech only stimuli. We hypothesized that children with ASD would exhibit reduced activation in IFG and pSTS, particularly for incongruent gesture-speech pairings, and that these neural disruptions would correlate with social communication deficits.

Methods:

7 (1/6 F/M) children with ASD and 11 (9/2 F/M) typically developing (TD) children, aged 5 to 10 years, all with average range IQ scores, and we anticipate collecting data from 8 additional ASD and 4 additional TD children. Groups are matched for age and sex (mean age = 8.5 years; 8/10 females/males). Using fNIRS, we measured oxyhemoglobin (HbO) and deoxyhemoglobin (HbR) concentration changes in IFG and pSTS bilaterally the four experimental conditions. An interleaved design was used, with each trial consisting of a fixation period (4–6 seconds), followed by stimulus presentation (3–4 seconds), a 500-ms blank screen, and a 10-second response window. Responses were extracted by averaging the signal from the stimulus presentation onset through the response phase (i.e., to the offset of the response window). Data were processed with motion artifact removal, Fast Fourier Transform, and band-pass filtering techniques. Group differences in functional activity in the IFG and pSTS were assessed using a generalized linear model (GLM).

Results:

Only correct trials were included in the analysis. Children with ASD exhibited reduced activation in left IFG and pSTS during all pairings, with particularly pronounced reductions during incongruent gesture-speech pairings, compared to TD. No significant differences in activation were observed in the right hemisphere between groups.

Conclusions:

This study provides new evidence of reduced neural activity during gesture-speech integration in children with ASD in IFG and pSTS, both of which play a key role in multimodal processing. These findings reinforce the importance of multimodal processing in gesture-speech integration and point to neural processes underlying this aspect of communication impairments in ASD.

439.185 Language Differences in Regressive and Non-Regressive Autism: The Role of Speech and Language Therapy, Cognitive Skills, and Autism Characteristics

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Background: Developmental regression in autism, marked by the loss of previously acquired abilities, often occurs between 6 and 30 months, and affects 30% of autistic children. In contrast, those without regression may show early developmental delays, including atypical language and social skills. These differences in onset patterns are linked to variability in developmental domains including cognitive abilities, motor skills, and language proficiency. Early recognition and intervention of language difficulties in autism are crucial for long-term outcomes. Speech and language therapy (SLT) is considered a fundamental intervention, but its differential impact in autistic children with and without regression has not yet been thoroughly examined.

Objectives: This study aimed to 1) Examine how the interaction between autism onset (regression vs. non-regression) and SLT participation affects language outcomes, and 2) Determine if cognitive abilities, motor skills, and autism characteristics predict language development in autistic children with and without regression.

Methods: The study included 117 autistic children aged 2 to 10 years (boys=95, girls=22), classified into regressive (n=21) and non-regressive groups (n=96) based on retrospective parent reporting during developmental history sessions. Children were further subdivided based on their history of SLT participation—those who received therapy before diagnosis (n=42) and those without any prior intervention (n=75). Measures included language outcomes, which were assessed in three domains: total language, receptive language, and expressive language. Cognitive abilities were measured using the DAYC-2, and autism characteristics were assessed with the Childhood Autism Rating Scale (CARS).

Results: MANOVA revealed a significant interaction between autism onset type and SLT participation, affecting total, receptive, and expressive language abilities (Wilks' $\Lambda = .83$, $F(3, 113) = 7.84$, $p < .001$). Post-hoc two-way ANOVAs showed the interaction effect between onset type and SLT was significant for receptive ($F(1, 113) = 10.221$, $p = .002$, $\eta^2 = .083$) and expressive language scores ($F(1, 113) = 22.596$, $p < .001$, $\eta^2 = .167$). These findings suggest that attending SLT significantly positively affected language development for autistic children with regression (See Figure 1).

Additionally, cognitive ability emerged as a significant positive predictor of language development ($t = 2.115$, $p = .037$), while autism characteristics were a strong negative predictor ($t = -6.403$, $p < .001$). Gross motor ($t = -.741$, $p = .460$) and fine motor skills ($t = -.552$, $p = .582$) were not significant predictors. For the non-regression group, autism characteristics remained a significant negative predictor ($t = -6.264$, $p < .001$), but no significant predictors were identified for the regression group.

Conclusions: The study highlights the importance of personalized interventions based on autism onset patterns, emphasizing that SLT may be more effective when tailored to the child's specific developmental Understanding the interaction between SLT, cognitive abilities, and autism characteristics can help clinicians design more effective therapies for improving communication skills. Further research is essential to expand these findings and to explore how these variables influence long-term language outcomes.



439.186 Language Style Matching and Conversational Success in Autistic and Non-Autistic Adolescents

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Background: Successful conversations are characterized by mutual engagement and coordination across multiple verbal and non-verbal domains. One type of linguistic coordination is language style matching (LSM), which captures the degree to which two people emulate each other's speaking style during a conversation, marked by the degree at which participants produce similar rates of function words (Gonzales et.al., 2010). Prior research in neurotypical populations suggests that greater LSM is associated with better conversational outcomes (greater perceived conversational quality; Ireland et.al., 2010), but little is known about the relationship between LSM and conversational outcomes in autistic adolescents or teens with other neurodevelopmental/psychiatric conditions.

Objectives: Examine the relationship between LSM and conversation quality to determine if greater LSM correlates with better conversational outcomes in autistic teens (AUT), neurotypical teens (NT), and teens with other neurodevelopmental/psychiatric conditions like ADHD or anxiety (PSY).

Methods: One hundred and thirty-seven adolescents (AUT N=36, 14 female; NT N=23, 8 female; PSY N=78, 40 female) aged 12-18 years participated in a 5-minute, "get-to-know-you" conversation with novel young adult interlocutors (study staff). Both participants and interlocutors respectively completed a 15-question Conversation Rating Scale (CRS; Ratto et.al., 2011) immediately after finishing the conversation. Questions on the CRS were rated on a 7-point Likert scale, with the sum of all questions calculated to produce a total score (higher scores indicate greater conversational success and satisfaction). Conversations were orthographically transcribed and a pairwise comparison LSM metric for each dyadic conversation was computed using LIWC-22 (Pennebaker, 2022). Participant and confederate CRS scores were then separately correlated with their respective conversational LSM.

Results: Across the entire sample, there was a significant positive correlation between extent of language style matching between conversation partners and staff ratings of conversation quality (Fig. 1a). This effect held within the PSY and AUT groups separately (Fig. 1b, 1c). There was no significant correlation between CRS scores and LSM in NT dyads (Fig. 1d). Correlations between LSM and conversation quality as rated by teen participants followed a different pattern, with no statistically significant correlations overall nor within each subgroup separately.

Conclusions: Greater language style matching during naturalistic conversations between teens with autism or other neurodevelopmental/psychiatric conditions and adult interlocutors leads to perceptions of greater conversational success – but only from the adult perspective. These results, while preliminary, suggest that adolescents may not perceive a conversation as successful even when they and their conversation partner are engaging in a high degree of language style matching. Future research is warranted to clarify the extent to which language style matching predicts conversational success in other relevant contexts (e.g., between same-aged peers of different neurotypes) and if there may be other measures that predict adolescent conversation ratings.

**439.187 Leveraging Retrieval-Augmented Large Language Models for Enhanced Communication of Autism Therapy Guidelines**

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Background:

The complexity of autism spectrum disorders (ASD) and the frequent requests for guidance that clinicians receive make it challenging for clinicians to provide personalized advice for each child within limited time constraints. Clinicians often turn to autism-specific toolkits as resources to answer common questions. However, conveying this information to caregivers does not always result in tailored instructions that meet each child's unique needs, or clear actionable advice for caregivers, as the information tends to be generalized.

Objectives:

Adopting a Large Language Model (LLM)-centered approach can enable clinicians to quickly generate and share personalized, conversational responses with caregivers, aligning with the specific needs of each child and caregiver with minimal time and effort. By combining an LLM-centric approach with Retrieval-Augmented Generation (RAG), we introduce a framework that uses embedding finetuning and prompt chaining to improve both answer accuracy and clarity, including generating clear examples for better caregiver understanding. Initial testing with a selected set of questions showed that clinician evaluators preferred our RAG-enhanced model over a general LLM (ChatGPT).

Methods:

To ensure factual accuracy and reduce hallucinations, we compiled a comprehensive autism-related resource collection, guided by clinicians, including research papers, Autism Speaks toolkits, and journal articles. This collection supports reliable responses to autism treatment inquiries. To further enhance document retrieval accuracy, we customized the out-of-shelf embeddings by fine-tuning on a synthetic dataset curated from autism-specific documents, increasing the relevance and quality of retrieved content.

Our framework consists of two main components. First, the offline component organizes and stores essential documents in a fast, flexible embedding database. The second component operates online, retrieving relevant documents in response to user queries and using prompt chaining to generate detailed answers. We employed a three-stage prompt chaining approach with ChatGPT (gpt-4-0613) to generate responses for autism treatment queries. The generative stage creates responses based only on the retrieved documents. In the validation stage, we verify each response step against the documents to avoid reliance on LLMs internal knowledge. Finally, the elaboration stage enhances the response with easy-to-understand examples, making the guidelines more accessible and actionable for caregivers.

Results:

During initial testing, we compared the RAG model to standalone ChatGPT using five main evaluation categories: "Factuality," "Completeness," "Safety," "Creativity," and "Similarity." Two pediatric specialists rated responses on a scale from 1 to 10 for five questions, assessing 11 criteria. Shown in Figure 1, Regarding the aspect of factuality ([A], [B]), the RAG model's performance is marginally better according to evaluations by clinicians, and the explanations provided by the RAG model were deemed by clinicians to be most closely aligned with the actual responses given by physicians ([K]). According to the Creativity ([I]) aspect, the RAG model outperforms ChatGPT by an average of 40% in mean ratings.

Conclusions:

Clinicians preferred the RAG model 70% of the time, underscoring its potential to simplify the creation and timely delivery of autism guidelines. Future work will involve refinement through broader clinician feedback and enhancing model using retrieval optimization.



439.188 Development of Receptive Vocabulary and Verbal Fluency Skills from School-Age to Adolescence in Autistics and Non-Autistics

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Background: Language skills are established predictors of positive long-term outcomes in autism.^{1,2} Most studies focus on monolingual speakers in the early years.³ Yet, vocabulary skills develop into adulthood and are important for functioning in multiple domains.^{4,5} We focus on the development of receptive vocabulary, expressive vocabulary (via a semantic verbal fluency task) and non-verbal IQ (NVIQ). Prior work has found autistic youth to have receptive vocabulary scores at the lower end of the normal range.⁶ In autism, higher NVIQ has been found to be associated with greater receptive vocabulary growth.^{7,8} Researchers have also found performance on verbal fluency tasks, where people are asked to produce items in a given category (e.g. animals), to increase with age.⁹

Objectives: We address a gap in our understanding of adolescent language development through an inclusive and intersectional lens,¹⁰ by following French speakers (the majority of whom are multilingual), who are autistic or non-autistic, from school-age to adolescence. We compare developmental trajectories of their receptive vocabulary and verbal fluency. We also investigate the role NVIQ plays in receptive vocabulary development.

Methods: We followed twenty-six participants (12 autistic, 14 non-autistic) from school-age (T1; 5 to 10 years old) to adolescence (T2; 12 to 19 years old), with approximately 8 years between visits (M = 100 months, SD = 9.24 months). Participants were tested in Montreal, Canada in French, as this was the shared language of the sample. Receptive vocabulary was measured using raw scores from the *Échelle de vocabulaire en images Peabody* (ÉVIP)¹¹. Semantic verbal fluency was analyzed using the number of correct words produced.¹² NVIQ was measured using raw scores on the Leiter International Performance Scale-Revised.¹³

Results: Data from T1 and T2 are plotted in Figure 1. We ran linear mixed effects models with timepoint, diagnostic group, and number of months between T1 and T2 (as there was significant variability) as fixed effects, and participant ID as the random intercept (i.e., grouping factor).

Receptive vocabulary: there was a significant effect of timepoint (higher at T2) and number of months between visits (decreasing with greater separation between visits). There was a significant interaction between timepoint and group: the autistic group experienced more gains in receptive vocabulary. **Verbal Fluency:** the only significant effect was of timepoint (higher at T2). **NVIQ and receptive vocabulary growth:** we examined the relationship between T1 NVIQ and receptive vocabulary growth (Figure 2). We observed a non-significant trend for an inverse relationship ($\rho = -.24$; higher NVIQ, less growth).

Conclusions: We found similar patterns of receptive and expressive vocabulary growth in autistics and non-autistics. A subset of autistic participants were the lowest performers at both timepoints, while other low performers experienced significant growth and caught up by adolescence. In contrast to prior findings, lower NVIQ did not predict if participants remained low in receptive vocabulary; in fact, we found a trend in the opposite direction. This is likely due to the majority of our sample having high NVIQ, and those with lower NVIQ showing a “catch up” trajectory.



439.189 Mandarin-Speaking Autistic Preschoolers' Production, Comprehension and Prosodic Modification of Grammatical Aspect Marker LE

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Background: The knowledge and use of grammatical aspect/tense markers are key indicators of language development in young children. Autistic children often struggle with producing these markers in both Western and Eastern languages, such as English and Chinese. However, both English- and Chinese-speaking autistic preschoolers have been found to have relatively intact comprehension of grammatical aspect markers, suggesting aspectual comprehension to be a strength and independent from aspectual production challenges. However, few studies have examined both production and comprehension in young autistic children simultaneously. Furthermore, as a syllable-timed language, Chinese prosody can better reflect grammatical knowledge of aspect markers through prosodic features, such as the shortening of perfective marker "le," which may provide additional insight into aspectual comprehension.

Objectives: 1) To compare autistic children with typically developing (TD) children and children with developmental language disorder (DLD) in order to determine whether atypical patterns of production and comprehension of aspect markers are specific to autistic language; to explore the prosodic characteristics of the aspect marker "le" in these three groups and gain insight into their understanding of this morphosyntactic cue.

Methods: The study included 20 autistic children aged 3 to 7, 25 typically developing children, and 12 children with DLD. The groups were matched on chronological age and receptive vocabulary. A verbal elicitation task was used to assess the production of the perfective marker "le." In addition to production accuracy, the duration of syllables/words in three-word sentences (verb + hao/wan + le) was measured to capture prosodic modulation. A picture-sentence matching task was then used to assess comprehension of "le." Lastly, an asymmetry index was calculated to evaluate the balance between production and comprehension abilities.

Results: No significant differences in the production accuracy of "le" were found across the autistic, TD, and DLD groups. However, durational analysis revealed atypical prosodic patterns in the autistic group. While the TD group showed no significant variation in syllable duration, with a trend toward "le" shortening, the DLD group demonstrated a quadratic trend, with shortening of both the verb and "le." In contrast, the autistic group exhibited a linear increase in syllable duration from the verb to "le," indicating atypical lengthening of "le."

Conclusions: Chinese preschoolers with autism display a distinct pattern of atypical lengthening of the grammatical marker "le" compared to their TD and DLD peers, suggesting challenges with the rhythmic modulation and syntactic knowledge involving aspect markers. Comprehension data suggests that autistic children struggle more with understanding "le" than their neurotypical peers, contrasting existing research. These findings depict a multifaceted profile of aspect marker knowledge of autistic preschooler, and add linguistic diversity to the literature.

439.190 Natural Speech Markers of Autism Spectrum Disorder in Children

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Background: Autism spectrum disorder (ASD) is a neurodevelopmental condition characterized by persistent communication deficits, restricted interests (RI) and stereotyped behavior. Though very useful, standard tests used for ASD diagnosis are time-consuming, costly to perform, and dependent on highly specialized examiners who are unevenly available across world regions. Such shortcomings can be tackled via automated speech and language analysis (ASLA) tools, which offer affordable, accurate, automated metrics of potential relevance for diagnosing and phenotyping persons with ASD.

Objectives: The present pilot study aims to detect ASLA markers of ASD in children with a such a diagnosis (N=35) relative to typically developing children (N=37). Specifically, we compared the differences in these features between the group of children with ASD and the group of typically developing children.

Methods: For this purpose, semi-structured interviews were conducted on RI and topics of general interest (e.g., *how to prepare a cake or a backpack for a camping*). Afterwards, software CHAT was used to transform the audio to text, and to automatically extract speech metrics (fluency, disfluencies and morphosyntactics). For the acoustic metrics, an automated pipeline was used to preprocess the audio and then Praat to extract the required metrics. By the features of the sample, non-parametric statistical analysis (Mann U Whitney) was used to perform the analysis, comparing both groups in each task separately. The statistic significance level were set at $p = <0.05$.

Results: Relative to typically developing children, those with ASD presented greater fluency level (higher number of words, utterances and speaking time). However, a higher number of disfluencies (repetitions, corrections and stuttering) and a lower degree of lexical richness (type-token ratio) were also observed in the ASD group compared to the typical developing group, particularly during interviews about RI. Also, it was observed that children with ASD used more third person verbs and pronouns than typically developing children.

Conclusions: The results obtained show that, in describing their RIs, children with ASD produce more but verbose but less diverse, fluent, and self-centered discourse than neurotypical children. Such findings suggest that ASLA could be enhance the characterization and understanding of cognitive outcomes in children with ASD, representing an accurate, cost-effective diagnostic-support tool to complement traditional assessments.

439.191 Navigating AAC Applications: A Review of High-Tech Communication Apps for Autistic Children and Youth

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Background: Augmentative and alternative communication (AAC) refers to any communication modality other than speech used to convey messages (American Speech-Language-Hearing Association, n.d.). High-tech aided AAC uses computerized aids (e.g., tablets) that generate speech and supports communicative development and participation for autistic individuals (Beukelman & Light, 2020; Ganz, 2008). In recent years, the number of AAC applications (apps) available to download on a tablet or phone has grown significantly. However, limited research has examined how these apps differ from each other. To facilitate effective clinical decision-making, clinicians, families, and clients must have adequate resources to determine which AAC apps fit their needs. Selecting the best AAC app is a highly complex task unique to each client (Webb et al., 2023); thus, exploring and comparing their features is critical. Consequently, this systematic health app review aimed to explore and compare the AAC apps currently available on Android and Apple devices with the overarching goal of supporting communication for autistic children and youth.

Objectives: This review has two primary objectives: (1) What AAC apps are currently available for autistic children and youth? (2) How do the existing AAC apps vary according to accessibility (i.e., cost of the app, devices supported), individualization (i.e., adding new words, customizing voice), and usability (i.e., layout, easy to navigate)?

Methods: Our protocol was preregistered with the Open Science Framework (<https://osf.io/tsq8p>). Relevant apps were identified by searching key terms (e.g., “AAC & Autism”, “communication apps”) on the Apple App Store and Google Play Store. Two members of our team screened apps to identify those meeting our inclusion criteria: (a) standalone app available on Apple/Android phone/tablet; (b) available in Canada/US/UK; (c) available in English; (d) can be used by autistic individuals (i.e., not intended for a clinician/parent); (e) fit our definition of high-tech AAC (e.g., text-to-speech, symbol-based). Data extraction was completed in duplicate through information collected from the app store entries and exploration of each app.

Results: Searches captured 1277 apps across both app stores (including duplicates). Following the screening, 182 apps met the inclusion criteria, 63% of which were available to download at no cost. However, most apps were available only on Apple devices. The apps included text-to-speech and symbol-based systems, as well as alternative response methods (e.g., eye-tracking). Many apps had vocabulary to support communication in various contexts (e.g., school, home); however, some had vocabulary specific to a hospital or other healthcare setting. Findings regarding the accessibility, individuality, and usability features of each app will also be included in our presentation.

Conclusions: The findings of this review will provide clinicians, families, and clients with the necessary information to make informed decisions regarding which AAC apps are most suitable for their needs. Although we identified many apps that are free to download, most require an Apple device, which can be costly, significantly limiting their accessibility. Despite the abundance of apps identified, there is a need for additional good-quality AAC apps that are financially accessible across multiple devices.

439.192 Objective Measurement of Vocal Features in Early Development Among Toddlers with Later ASD

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Background: Toddlers with autism spectrum disorder (ASD) display atypical speech characteristics such as increased variability in fundamental frequency (F0). Objective measurement of these speech features early in development may help detect toddlers that go on to develop ASD from toddlers with no later ASD.

Objectives: Leverage audio recordings of individual toddlers during both low and high stress social interactions to determine if F0 distinguishes toddlers at 15 months with an eventual ASD diagnosis at 36 months from toddlers with no later ASD diagnosis during episode types of the Strange Situation Procedure (SSP).

Methods: 92 toddlers (51 boys) completed the SSP at 15 months and were later evaluated for ASD at 36 months (15 later diagnosed with ASD). Objectively measured vocalizations and cries from toddlers were identified during audio-video recordings of the SSP. Classification of child versus adult speech from Automatic Linguistic unit Count Estimator (ALICE) showed an overall agreement with an expert coder of 80% (Kappa= 0.79). Child cries were detected by software combining a support vector machine classifier using deep spectrum and acoustic features (filtering audio above 350 Hz), labeling if crying was detected in each one second window. Human expert coders labeled 400 clips as cry/ non-cry vocalizations with 76.3% overall agreement (Kappa= 0.45). PRAAT was utilized to obtain the mean and standard deviation of F0 of ALICE-identified child vocalizations (analyzed with a range of 90 to 600 Hz) and cries. Values were averaged within each SSP episode type to obtain the overall mean F0 (the mean of the mean) and overall mean SD of F0 (the mean of the SD) of each individual toddler's vocalizations and cries for each episode type. **Results:** No mean differences were found between toddlers with and without later ASD (Table 1). F tests indicated there was greater variability between toddlers with later ASD in mean F0 for vocalizations in the separation episode type ($p<.01$) and for cries in the low stress interaction episode type ($p=0.02$) than between toddlers without later ASD. Greater variability was also found between toddlers with later ASD in the mean SD of their F0 for vocalizations in the reunion episode type ($p=.04$) and for cries in the low stress interaction episode type ($p=.05$). Conversely, there was lower variability between toddlers with later ASD in the mean SD of F0 for vocalizations in the stranger introduction episode type ($p=0.04$).

Conclusions: Toddlers with later ASD exhibited more within group variability for the mean pitch and mean SD of the pitch of vocalizations and cries in some high- and low-stress episodes than toddlers without later ASD, suggesting that greater variability in vocal signaling may characterize groups of toddlers headed toward an ASD outcome. In the high-stress stranger introduction episode, however, toddlers with later ASD showed lower within group variability in the mean SD of F0 than toddlers without later ASD. These results suggest that the characterization of the emerging ASD phenotype by variability of objectively measured vocal features may be context-specific.



439.193 Orthographic Learning in Hyperlexic Children

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Background: Hyperlexia (HPL), characterized by precocious reading (decoding) skills that outstrip reading comprehension, occurs in approximately 5-10% of autistic children (Ostrolenk et al., 2017). It is often conceptualized as one form of restrictive and repetitive behaviors and interests (RRBIs). The mechanisms underlying reading acquisition in HPL are unknown and could reflect the extended time spent engaged in reading-related activities, or could reflect reliance on particular attentional, perceptual, or learning mechanisms.

Objectives: This study compared the learning of novel alphabetic and phonological systems in children with HPL versus neurotypical developmental histories.

Methods: Participants were four HPL children ages 5-10 and 44 neurotypical controls. The HPL participants met DSM-5 criteria for autism, had reading scores 1.5 SD > than language comprehension or nonverbal IQ scores, and displayed precocious (prior to 4 years) acquisition of reading without explicit instruction and an early interest in reading (Table 1). Participants completed a novel **orthographic learning task**, in which they were presented with eight concrete nouns (e.g., “horse”), matched with a pronounceable nonword label (e.g., “mig”) that was “spelled” with a novel orthographic character (e.g., see in image below). The lexicon included items that were potential competitors in phonology or meaning. There were 8 learning trials during which participants were exposed to pairings of symbols, spoken labels, and pictures, with feedback about the correct mappings, followed by 32 trials testing their ability to choose the correct picture when given the orthographic symbol and spoken label (OrthToPic trials), and 32 trials testing their ability to choose the correct orthographic symbol when given the spoken label and picture (PicToOrth).

Results: Given the small HPL sample, inferential statistical tests were not conducted. The HPL group's scores on standardized assessments of phonological decoding skills ranged from High Average to Very Superior ($M = 129$). On the orthography task, across groups, participants attained 70-80% accuracy within the first 8 trials and had overall greater accuracy in the OrthToPic condition (HPL = 83.6%, NT = 80.7%), while accuracy was much lower in PicToOrth condition (HPL = 63.3%, NT = 62.8%). We examined learning over the course of trials by measuring accuracy between groups for each quartile (8 trials per quartile). Looking at the fourth quarter of each condition cleared showed the HPL group with faster and more accurate learning in OrthToPic condition (HPL = 89.3%, NT = 77.5%) and PicToOrth condition (HPL = 70.2%, NT = 63.1%; See Figure. 1).

Conclusions: When learning of a novel lexicon and orthographic system, the overall accuracy appeared to be similar. However, HPL children displayed enhanced learning and performance accuracy appeared greater in the final quarter of trials across both experimental conditions. This finding is consistent with the hypothesis that HPL does not simply reflect from extended “time on task,” but may instead suggest the presence of special perceptual or learning mechanisms. These findings are exploratory and tentative, given the small size of the HPL group.



439.194 Characterizing Fast Responders Among Minimally Verbal Autistic Children Receiving Social Communication Intervention

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Background: Early intervention can be a helpful resource for autistic children experiencing challenges or delays in core areas of development. However, autism encompasses a wide range of developmental abilities, and autistic individuals in need of early intervention may benefit from an adaptive approach that can address their dynamic needs (Kasari et al., 2014; Almirall et al., 2016). This is especially true for minimally verbal (MV) autistic children, whose social communication skills can be complex and variable. Adaptive interventions give service providers the ability to adjust strategies and approaches to match the needs of an individual. A critical component of an adaptive intervention approach is the ability to assess response to the intervention in order to make a decision on the best course of action. Previous work in identifying response to intervention has identified key predictors such as IQ, age, and expressive language ability. However, it may be helpful to examine core developmental skills as important variables driving decisions in adaptive intervention approaches.

Objectives: The current study aims to explore how core developmental skills of MV autistic children are related to fast response to early intervention. Specifically, we are looking at baseline developmental skills that predict fast response to an adaptive intervention approach and characterizing the skills that are changing among MV children identified as fast responders.

Methods: This is a secondary data analysis of 194 MV autistic children ($M=72.42$ months old, $SD=15.14$ months) that were recruited to receive an adaptive intervention. The children were assessed for their development in social communication, play, expressive language, and cognition prior to receiving the adaptive intervention, and again after six weeks of intervention. At the six week mark, children were also assessed for their response to the intervention using a Clinical Global Impression Scale (CGI), which identified children as fast or slow responders to the intervention.

Results: Logistic regressions were used to determine the association between core developmental skills and early response to initial intervention while controlling for site differences, age and gender. Child initiated joint attention ($Z=2.439$, $p=0.015$) and response to joint attention ($Z=2.28$, $p=0.023$) predicted fast response to intervention. Higher play mastery level and more diversity at baseline also significantly predicted fast response ($Z=3.46$, $p<0.001$; $Z=3.405$, $p<0.001$). Among children identified as fast responders, requesting skills and responding to joint attention were identified as important variables. Children with improved requesting skills ($Z=2.565$, $p=0.0103$) and response to joint attention ($Z=0.979$, $p=0.007$) had increased odds of being identified as fast responders to the intervention.

Conclusions: Identifying important core developmental skills among MV autistic children can play a critical role in the decision making process of adaptive interventions. Especially helpful for MV children is the ability to identify meaningful skills and change related to early intervention. Our analyses identified the importance of core developmental skills like joint attention and play as meaningful predictors of fast responders. Furthermore, the skills that made the most change among these fast responders were requesting skills and response to joint attention.

439.195 Patterns of Codeswitching Among Multilingual Chinese Immigrant Caregivers of Autistic Children in the US

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Background: Around the world, bilingual and multilingual speakers outnumber monolinguals (Kohnert & Medina, 2009). Recent census data in the U.S. finds that one in five Americans speak a language other than English at home. Codeswitching is a common practice among multilingual speakers where the speaker alternates between two or more languages within a single conversation, sentence, or situation. Research on typically developing multilingual children has shown that adult caregivers or teachers' codeswitching has a positive impact on children's cognitive flexibility (Sun et al., 2019), and when children codeswitch, it helps them fill lexical gaps (Kuzyk et al., 2019) and serves as a marker of linguistic competence (Yow et al., 2017). Furthermore, bilingual children reading "codeswitching" children's books are more likely to enjoy a novel word retention boost (Read et al., 2020). Research is emerging on the topic of codeswitching among autistic children or their adult caregivers. In Yu's single case study, a bilingual autistic child strategically and systematically uses codeswitching as a pragmatic communication resource (Yu, 2016). More research is needed to better understand how multilingual caregivers practice codeswitching across different activities.

Objectives: To fill this gap, we collected video clips of mother-child interactions from multilingual Chinese immigrant families with autistic children (2-5 years) in naturalistic settings.

Methods: Eleven Chinese mothers and young children under the age of five with autism were recruited as part of a pilot parent psychoeducational intervention study. Each mother-child dyad was asked to select three daily activities (5 minutes per activity) from the following: play with small toys (e.g., cars, figurines, puzzles), play with larger objects (e.g., large ball), play with people, reading a book, caregiving (e.g., changing diaper, washing hands), and house chores. The frequency of codeswitching was coded from videos using ELAN. We also documented the type of activity in which codeswitching happened and the caregiver and child's conversation.

Results: Children were, on average, 3.7 years old ($SD=1.32$) and had a mean Social Communication Questionnaire score of 20.9 ($SD=5.85$). Preliminary analysis shows that caregivers, on average, codeswitched 27 times during 15 minutes of interaction. Codeswitching happened most often during play activities as compared to the other five activities. Codeswitching from Chinese to English served as a tool to a) reinforce rules (e.g., "No," "Sit down," "Wait"); b) teach and label (e.g., "triangle" "purple"); and c) show encouragement ("You got this!" "Good job"). Codeswitching from English to Chinese served broader linguistic functions.

Conclusions: This study explores how multilingual Chinese immigrant mothers code-switch during daily activities. We found that codeswitching happens more often during play activities as opposed to other activities. This may be due to the more action-oriented nature of play. Playing with their children is also a relatively "new" concept to many Chinese parents since children are expected to play with each other rather than with their parents. Therefore, parents may be filling the linguistic gap with English they could use during play (e.g., high five, you got this). Further studies should explore children's reactions and outcomes in the context of caregivers' codeswitching.

439.197 Preliminary Validation of a Naturalistic Play-Based, Caregiver-Mediated Communication Measure for Young Autistic Children

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Background: Although communication is often a primary goal of early intervention to support young autistic children, there are few communication measures that are designed to be sensitive to change to assess child communication outcomes. The Early Communication Indicator (ECI) is a norm-referenced, progress-monitoring tool to measure change in communication/early language skills (gestures, vocalizations, single words, multiple words) in young children in the context of naturalistic play interactions with a familiar adult (Buzhardt et al., 2022; Greenwood et al. 2013; 2020). Our team adapted the tool to create the ECI-Autism (or ECI-A), which also includes social-communication skills that are common intervention goals (joint attention and directed communication) and is validating the measure with a large group of autistic children up to 60 months in age.

Objectives: The objectives of this measure validation study are (1) to examine preliminary descriptive data from the ECI-A, and (2) to examine preliminary psychometric data on reliability and validity.

Methods: To date, the study team has recruited about 352 autistic children (12-60 months) and their caregivers to participate in the study. The ECI-A has been collected and coded for 262 of the recruited participants. The participants are racially/ethnically diverse (~54% are from historically marginalized populations in the US) and socio-economically diverse (~32% have household incomes <40K US dollars). At Time 1, participants completed the ECI-A, a 10-minute play-based assessment that includes free play with a house or barn play set and four activities designed to elicit joint attention. The ECI-A video-recordings were then scored by trained coders, which resulted in counts of gestures, vocalizations, single words, and multiple words, and a weighted communication rate, as well as proportion of initiation of joint attention (IJA, 0-1 score) and mean ratings for direct communication (0-3 score). The child and/or caregiver participants also completed autism screeners, direct assessments (e.g., Mullen, ADOS, BOSCC), and caregiver-report measures (e.g., ABAS, PICS). A subset of the sample completed the ECI-A at additional time points (1-2 week test/retest, 6 weeks, 6 months, 12 months).

The final analysis will include (a) descriptive data for the primary ECI-A measures (mean, SD, and range), (b) analyses of reliability (inter-rater and test-retest reliability using ICCs), and (c) analyses of validity (concurrent and divergent validity with other measures using Pearson's correlations, sensitivity to change with growth trajectories). Data collection will conclude in December 2024, but we present several preliminary findings below based on available data.

Results: The ECI-A captures a range of communication skills in young, autistic children and has strong inter-rater reliability (see Table 1 in attached image). Additionally, the ECI-A has medium and large correlations with the PICS and BOSCC, respectively (see Table 2). A preliminary analysis of cross-sectional growth trajectories of IJA suggests that the measure does not have floor or ceiling effects (see Figure 1).

Conclusions: The ECI-A is a promising tool for progress monitoring in research and practice, and is relatively easy to administer and code. There is emerging evidence of the ECI-A's reliability and validity based on preliminary analyses.



439.198 Receptive Vocabulary, Joint Attention, and Emergent Literacy Skills in Autistic Children

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Background:

While previous research has addressed emergent literacy skills' relation to domain-specific joint attention literacy activities (e.g., Wicks et al., 2020), less attention has been paid to how emergent literacy relates to domain-general joint attention and receptive vocabulary in autistic children. Emergent literacy is a developmental stage in which skills, knowledge, and attitudes that are the precursors of reading begin to develop (Whitehurst & Lonigan, 1998). Autistic children have a pattern of struggling with specific emergent literacy skills while showing strengths in others (Westerveld & Roberts, 2017). Potential challenges may be due to more limited engagement in literacy, language and joint attention activities.

Objectives:

The primary objective of this study is to observe how receptive vocabulary skills and joint attention skills relate to emergent literacy skill outcomes in autistic children. While autistic children have shown patterns of being less engaged in domain-specific joint attention activities such as shared book reading (Wicks et al., 2020), they may show different patterns of joint attention in domain-general activities. Domain-general joint attention may relate to receptive vocabulary and emergent literacy outcomes.

Methods:

17 autistic and 20 non-autistic children participated (see Table 1 for demographics). All autistic children had a clinical diagnosis established by a pediatrician or licensed clinical psychologist. Following consent procedures, children were assessed in their receptive vocabulary skills using the PPVT-4 (Dunn & Dunn, 2007) and emergent literacy skill measures. Parents were administered a parent-report questionnaire to assess their child's domain-general joint attention skills.

Results:

While autistic and non-autistic children's PPVT-4 scores did not significantly differ, they were trending in that direction ($p = .06$). Receptive vocabulary was found to be statistically significantly correlated to all six emergent literacy skills tested (letter knowledge, phonological awareness, print concept, name writing, oral narrative quality, and oral narrative comprehension) for autistic children. In contrast, receptive vocabulary was only significantly related to the emergent literacy skills of phonological awareness and print concept for non-autistic children. Joint attention was found to be significantly related to meaning-related emergent literacy skills (oral narrative quality and oral narrative comprehension) in autistic children but was not significantly related to any emergent literacy skills in non-autistic children. Receptive vocabulary and joint attention were also found to be related in autistic but not non-autistic children.

Conclusions:

Receptive vocabulary skills play a significant role in autistic children's emergent literacy skills regardless of whether those skills are a strength or a weakness. Domain-general joint attention also plays a role in autistic children's meaning-related emergent literacy skills. Receptive vocabulary and joint attention are also related skills that both affect literacy outcomes. Further research should explore how to encourage receptive vocabulary and joint attention skills in autistic children in order to bolster emergent literacy outcomes. Clinicians and teachers may benefit autistic clients and students by explicitly training vocabulary rather than relying on implicit vocabulary acquisition. This explicit teaching may aid in emergent literacy skills and literacy abilities later in development.



439.200 Speech-like Vocalizing and Expressive Language in Very Young Infants at Elevated Likelihood of Autism: Does Parent Input at 6 Months of Age Predict Infant Behavior at 12 Months?

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Background: Infant vocalizations are quantifiable behavioral markers that are easily obtained long before a reliable autism diagnosis can be made. In infants at elevated likelihood for autism, speech-like vocalizations at 12 months are associated with diagnosis at age 2 (Plate et al., 2022). Parent speech can influence child language outcomes. In typically developing samples, parent vocabulary diversity, syntactic complexity, and number of words all influence children's language outcomes (Anderson et al., 2021). In autism, Swanson and colleagues (2019) studied a sample including infants at low- and elevated-likelihood of autism by virtue of having an autistic older sibling. They found that more adult words and conversational turns at 9 and 15 months was associated with better language at 24 months. In another low- and elevated-likelihood sample, Northrup and Iverson (2015) found that more overlapping speech and reduced vocal coordination between mother and infant at 9 months predicted greater language delay at 3 years. These findings underscore the importance of parental language input for language development in children at elevated likelihood for autism, but this relationship has rarely been explored in infants younger than 9 months.

Objectives: Investigate whether parental language input at 6 months is associated with (1) infants' natural language output (number of speech-like vocalizations) and (2) standardized language outcomes (Bayley receptive and expressive scaled scores) at age 1.

Methods: Of 88 total participants collected thus far, participants in this preliminary analysis included 11 infants (5 female, 6 male), 10 of whom had standardized language scores at age 1. All infants were at elevated likelihood for autism by virtue of having an autistic older sibling, and completed 12-minute parent-child at-home freeplay sessions at 6 and/or 12 months of age. To quantify natural language, a team of reliable coders segmented and annotated freeplay recordings, labeling infant vocalizations and transcribing all adult speech. Lexical diversity was calculated using the 'quanteda' package in R (Benoit et al., 2024).

Results: Preliminary results revealed a significant positive association between parent vocalization rates at 6 months and their infants' expressive language scaled scores at 12 months ($\beta=0.035$, $SE=0.011$, $p=0.013$) (Figure), but not receptive language scores ($\beta=0.012$, $SE=0.015$, $p=0.45$). In this small sample, there was no strong association between parent speech (number of speech vocalizations or lexical diversity) at 6 months and infant speech-like vocalizations at 12 months. Parent lexical diversity was not associated with infant language scores at 12 months.

Conclusions: In this preliminary study of parental input and infant language outcomes in the first year of life, we found a positive relationship between parent talk at 6 months and infants' expressive language at 12 months. By April 2025, we anticipate doubling our coded sample, which will provide sufficient power to assess the relationship between parent input and children's natural language output 6 months later. Future research with larger samples is important to understand nuances in the relationship between parent and infant language in samples at elevated likelihood of autism, which may predict long-term communicative outcomes.

**439.201** Syntactic Complexity and Lexical Diversity in Non-Autistic Children and Autistic Children with and without Language Difficulty

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Background: Language profiles in autism are heterogeneous (Kjelgaard & Tager-Flusberg, 2001), and individual language profiles can be defined based on differences in structural (rather than pragmatic) language abilities (Tager-Flusberg, 2006). Narrative assessment is a common language sampling tool used to assess language difficulty. Meta-analyses examining narrative structures in autistic and non-autistic children suggest autistic children tend to produce narratives with less complex syntax and lower lexical diversity (Baixauli et al., 2016). However, these studies often compare autistic to non-autistic children while overlooking the role of children's overall language skills. Furthermore, findings are inconsistent across individual studies. In one study including non-autistic children and autistic children both with and without language difficulty, autistic children with language difficulty produced less syntactically complex narratives, while lexical diversity did not differ among groups (Peristeri et al., 2017). Other studies found no difference in syntactic complexity among autistic and non-autistic children's narratives (e.g., Diehl et al., 2006). To reconcile inconsistent findings, additional work accounting for whether autistic children have co-occurring language difficulty is needed.

Objectives: To assess differences in the narrative microstructure (i.e., utterance-level measures of narrative production) of non-autistic children and autistic children with and without language difficulty.

Methods: Twenty-six non-autistic children, twenty autistic children without language difficulty (A-noLD), and ten autistic children with co-occurring language difficulty (A-LD) aged 6-17 years old ($M=10.4$, $SD=2.7$) completed the ADOS-2 "Telling a Story from a Book" task. Language samples from the task were transcribed in accordance with Systematic Analysis of Language Transcripts (SALT) conventions. Mean length utterance (MLU) in morphemes, a measure of syntactic complexity, and number of different words (NDW), a measure of lexical diversity, were extracted based on the SALT transcripts. Non-autistic and A-noLD groups were matched on overall language skills (measured by CELF Core Language Scores).

Results: One-way ANOVAs revealed a significant effect of diagnostic group on children's narratives' MLU [$F(2,53)=4.26$, $p=.019$, $\eta^2=0.14$] and NDW [$F(2,53)=6.90$, $p=.002$, $\eta^2=0.21$]. Post-hoc analyses revealed that non-autistic children's MLU was significantly greater than A-LD children's MLU [$p=.014$] (and not A-noLD children's), while NDW differed between non-autistic children and both A-LD [$p=.002$] and A-noLD children [$p=.006$]. NDW did not significantly differ between A-LD and A-noLD groups [$p=.66$] (see Figure).

Conclusions: Findings suggest that autistic children without language difficulty produce utterances with syntactic complexity that are comparable to their non-autistic peers. Whereas much of the existing literature suggests that autistic children produce less syntactically complex utterances than non-autistic children, the present findings indicate that this difference may be attributed to overall language skills. While syntactic complexity may look similar among non-autistic and autistic children without language difficulty, autistic children, regardless of language difficulty, produced utterances with lower lexical diversity than non-autistic children. Future directions include examining narrative macrostructure and comparing narrative task performance to other language sampling contexts, like conversations. By highlighting the unique language patterns and varying profiles of strengths within autism, findings emphasize the critical need for comprehensive and individualized language assessment and intervention approaches for autistic children.



439.202 The Influence of Body-Object Interaction Rating on Semantic Processing in Autistic and Non-Autistic Adults

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Background:

Word features influence when we learn words and how we process the words when we read them. The ease with which one can interact with the word's referent (Body-Object Interaction Rating; BOI) has been shown to influence word processing (Pexman et al., 2019). Motor skills and language are highly interrelated in early development. Autistic individuals often have clinically significant motor difficulties, making it more difficult for them to interact with objects. This may alter their association with their object-body interactions and words for objects. We aimed to examine embodied language processing in autistic and non-autistic individuals using the BOI rating.

Objectives:

We aimed to extend the previous literature by: 1) examining the effect of BOI on word processing in autistic adults, and 2) examining differences in the effect of BOI on word processing between autistic and non-autistic adults.

Methods:

We assessed word processing in 152 adults using the online Prolific platform, with 76 autistic adults who reported receiving a formal autism diagnosis and 76 non-autistic adults who did not identify as autistic or have a history of being diagnosed as autistic. The participants completed a semantic decision task in which participants were presented with 600 printed words individually and were asked to classify whether the word was a concrete or abstract word. Of the 600 words, 300 were abstract nouns and 300 were concrete nouns that were matched on age of acquisition, frequency, and contextual diversity. The 300 concrete nouns consisted of 100 low, medium, and high BOI words following the Pexman et al. (2019) BOI ratings (from a scale of 1 to 7, $M_{\text{BOI-Low}} = 2.86$, $M_{\text{BOI-Medium}} = 4.19$, $M_{\text{BOI-High}} = 5.44$). Accuracy and reaction times were recorded for each word classification. Only trials for concrete words were used for these analyses.

Results:

Accuracy. We regressed proportion correct onto Group and BOI level (Adjusted $R^2 = .397$, $F_{5,450} = 60.92$, $p < .001$). We found a significant effect of Group with autistic participants having a higher proportion correct compared to non-autistic participants ($b = -0.023$, $SE = 0.010$, $t = -2.369$, $p = .018$, Figure 1). There were also significant effects of BOI level with the proportion correct being higher for medium and high BOI words than low BOI words ($b = -0.56$, $SE = 0.003$, $t = -16.19$, $p < 0.001$, Figure 1). Additionally proportion correct was higher for high BOI words than medium BOI words ($b = -0.03$, $SE = 0.006$, $t = -5.723$, $p < 0.001$, Figure 1). There were no significant interactions.

Reaction Time. We regressed reaction time onto Group and BOI level (Adjusted $R^2 = .176$, $F_{5,450} = 20.39$, $p < .001$, Figure 2). We found a significant effect of BOI levels with faster reaction time for high and medium BOI words than low ($b = 52.319$, $SE = 5.813$, $t = 9.0$, $p < .001$, Figure 2), with the fastest reaction time for high BOI words ($b = 41.28$, $SE = 10.07$, $t = 4.1$, $p < 0.001$, Figure 2)

Conclusions:

The current study found that autistic individuals are affected by the BOI level of concrete words to a similar extent to non-autistic individuals, with proportion correct increasing and reaction time decreasing as BOI level increased. Additionally, autistic individuals classified concrete words more accurately than non-autistic adults, indexing a relative strength in semantic classification.



439.203 The Relationship between Fundamental Frequency Variability and Fine Motor Skills in Autistic Children with and without Childhood Apraxia of Speech

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Background:

Childhood apraxia of speech (CAS), a developmental speech motor disorder, affects spoken language development in autism spectrum disorder (ASD, Chenausky et al., 2019). A decrease in fundamental frequency (F0) variability may help identify ASD with comorbid CAS at an early age, as it reflects developmental changes in phonatory control (Kent et al., 2021). Fine motor skill impairment is another common comorbidity in ASD, which may predict concurrent speech motor control. However, no study has investigated the relationship between speech and fine motor development in ASD with heterogeneous speech profiles.

Objectives:

1. Evaluate whether F0 variability differs between ASD with and without CAS.
2. Investigate the relationship between F0 variability and fine motor skills in ASD with and without CAS.

Methods:

The sample included 46 participants who received a community diagnosis of ASD, independently confirmed by the Social Communication Questionnaire (Rutter et al., 2003). Participants produced at least three attempts of a target vowel during a syllable imitation task.

The syllable imitation task involved six syllables ([bi], [ba], [bu], [bæ], [bʌ], [pʌ]), each consisting of a stop consonant and a vowel. A researcher who was a native American English speaker produced these syllables in the same order and asked participants to repeat immediately after the demonstration. Participants were given four attempts for each syllable. Participants' speech during this task was coded to determine whether they were assigned to the ASD with or without CAS group (Chenausky et al., 2019). If participants did not produce enough attempts to determine a CAS diagnosis, they were assigned to the insufficient speech group. F0 variability, measured as the ratio of the F0 standard deviation to F0 mean, was characterized from this task following the default setting in Praat.

Fine motor skills were measured using the raw score of the fine motor domain of the Vineland Adaptive Behavior Scales, Third Edition (Sparrow et al., 2016).

Spearman correlation and the Wilcoxon rank-sum test were performed to investigate the influences of age and sex on F0 variability because the F0 variability data did not fit a normal distribution. We then performed linear regression analyses to address both objectives.

Results:

F0 variability was not influenced by age or sex. ASD without CAS showed significantly higher F0 variability than ASD with CAS. A wide range of F0 variability was observed in ASD with CAS group. Lower F0 variability was associated with higher fine motor skills in both ASD with and without CAS groups.

Conclusions:

Fine motor skills predicted the concurrent development of phonatory stability in ASD, highlighting the significance of motor control in mastering fine-tuned gestures in fine motor and speech domains. At the group level, more stable phonatory control was observed in ASD with CAS than ASD without CAS, suggesting that phonatory control may be a relative strength in speech production for ASD with CAS. Future study should take a longitudinal approach to investigate the role of motor control in the development of fine motor and speech skills in ASD who later exhibit heterogeneous spoken language outcomes.



439.204 "Taking the Temperature" of Natural Conversations in Autism Plus ADHD: A Transdiagnostic Sentiment Analysis

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Background:

Autism and ADHD are two of the most common neurodevelopmental conditions of childhood, and they often co-occur (i.e., 37-85% of autistic children have co-occurring ADHD; Rong et al., 2021). Research suggests that autistic children with co-occurring ADHD experience increased autism symptoms and higher risk of developing anxiety and mood disorders (White et al., 2009). Unfortunately, children with autism+ADHD are often diagnosed later than children with autism alone (Wodka et al., 2021), reducing the likelihood that they receive timely interventions and supports. Autistic children and their ADHD peers both experience challenges when it comes to making and keeping friends (Black et al., 2024; Rokeach & Wiener, 2020), which may be due – in part – to atypical conversational interactions (Kouvava et al., 2022). However, little is known about conversational behavior in children with autism+ADHD vs. either diagnosis alone.

Objectives:

Assess language produced during a spontaneous “get-to-know-you” conversation in teens with autism+ADHD vs. autistic teens without ADHD vs. teens with ADHD without autism vs. neurotypical teens.

Methods:

Teens with autism+ADHD ($n=11$; 5 boys; age= 14.4 ± 1.8 y; IQ= 114.2 ± 20.1), autistic teens without ADHD ($n=12$; 6 boys; age= 15 ± 1.7 y; IQ= 115.4 ± 16.2), teens with ADHD only ($n=30$; 19 boys; age= 13.6 ± 1.8 y; IQ= 116.9 ± 16.1) and their neurotypical peers (NT; $n=22$; 15 boys; age= 13.9 ± 1.8 y; IQ= 111.9 ± 12.3) participated in a get-to-know-you conversation with a novel young adult confederate. Groups were matched on IQ ($p=0.76$), sex ratio ($p=0.53$), and age ($p=0.16$). Teens and undergraduate student confederates sat in separate rooms with high-quality video and audio interfaces; speech was recorded into separate channels and transcribed by trained human annotators. Lexical features were extracted from the transcripts using SEANCE (Crossley et al., 2017). Several principal component (PC) analyses reduced the feature space ($n=270$) into 20 major dimensions (e.g., arousal, positive/negative emotions, valence) that were given by the program. ANCOVA tested group differences with each lexical dimension (the first PC) as a dependent variable and group as an independent variable, covarying for other conditions (e.g., anxiety) and age. When a significant group effect was found, estimated marginal means were compared. P-values were adjusted using the false discovery rate (fdr).

Results:

Teens with autism+ADHD produced more words with strong emotions (i.e., higher valence; $F(3,68)=3.87$, $p=0.013$; Fig.1A) and more negative words ($F(3,68)=0.003$, $p=0.003$; Fig.1B) compared to teens with ADHD (valence: $p=0.016$, negative: $p=0.002$) and neurotypical teens (valence: $p=0.014$, negative: $p=0.012$). Autistic teens without ADHD did not differ from the other groups in these dimensions. Also, a significant group difference was found in other affect-related words ($F(3,68)=2.87$, $p=0.043$), where teens with autism+ADHD vs. NT: ($p=0.047$).

Conclusions:

Autistic teens with ADHD (autism+ADHD) use more words with strong emotional valence and more negative words than teens with ADHD only or neurotypical peers. Our results suggest that computational linguistic features extracted using a fully automated pipeline can reliably characterize conversational behavior in autistic teens with ADHD compared to other groups, which could inform personalized interventions that support social conversational success.



439.205 To “B” or Not to “B”: Exploring Letter Statistical Learning in the Language Network of Autistic Children

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Background: Autistic (ASD) children exhibit highly variable language and reading skills^{1,2}. The latest autism research has found an association between spoken-language skills and atypical statistical learning (SL, the detection and extraction of patterns from environmental input) in the linguistic domain^{3,4,5}. Moreover, the tight connection between syllable auditory SL and letter visual SL found in typically-developing (TD) children does not exist in autistic children, indicating a lack of support from phonological processes for letter SL in ASD. Indeed, reading difficulties in autism have been attributed to verbal communication and phonological difficulties^{6,7,8}. Thus, in the current fMRI study, we ask whether letters and their embedded patterns are processed by the language network in autistic school-aged children. The answers to this question will provide mechanistic insights for reading difficulties in autism.

Objectives: Here, we seek to explicitly examine how autistic children process letter sequences via studying the neural activation of the language-related brain regions during letter SL in both ASD and TD groups.

Methods: Using a visual letter SL task, we examined brain activation in seven language regions (defined by a language localizer task; Regions: left posterior superior temporal gyrus (LpSTG), left anterior STG (LaSTG), right pSTG (RpSTG), right aSTG (RaSTG), left temporal parietal junction (LTPJ), left inferior frontal gyrus (LIFG), left middle frontal gyrus (LMFG)) while children were passively viewing structured letter (embedded statistical patterns) vs random letter sequences (Fig.1) in 14 autistic and 22 TD children. (Exploratory: target of 25 and 25 by INSAR. ASD: 3 girls, $M_{age}=7.85$ years, $SD_{age}=1.03$. TD: 12 girls, $M_{age}=8.78$ years, $SD_{age}=2.04$. Gender/age differences marginal but controlled for). To maximize learning, structured and random letter sequences were presented in separate runs and intermixed with random image and structured image sequences (Fig.1⁹).

Results: In TD, the LpSTG, LMFG, and LIFG regions showed sensitivity to letters, regardless of sequence type (LpSTG: $t(43)=2.43$, $p<0.001$; LMFG: $t(43)=3.30$, $p<0.001$; LIFG: $t(43)=4.94$, $p<0.001$), but not ASD ($ps>0.10$, Fig.2). No sensitivity to images, regardless of sequence type, in either group were seen in these regions ($ps>0.10$). Furthermore, TD demonstrated sensitivity to structured over random letter sequences in the LIFG and LaSTG (LIFG: $b=0.25$, $SE=0.11$, $p=0.03$; LaSTG: $b=0.14$, $SE=0.07$, $p=0.03$), but not ASD ($ps>0.10$). This wasn't a case of lateralization effects – none of the right hemisphere regions defined by the language localizer or additional right-hemisphere homologues showed sensitivity to letters or letter sequences (structured over random).

Conclusions: Unlike their TD peers, letter SL in autistic school-aged children did not engage language-related regions of the brain. In fact, letters in either random or structured sequences did not activate language-related regions or their right-hemisphere homologues. These findings suggest that autistic children may not treat letters in their phonological forms during SL which might partially explain learning difficulty for patterns embedded within letters that might lead to downstream reading difficulties in autism.

¹Boucher, 2011

²Davidson & Weismer, 2013

³Hu et al., 2023

⁴Aslin & Newport, 2014

⁵Erickson & Thiessen, 2015

⁶Catts and Kahmi, 2005

⁷Newman et al., 2007

⁸Gabig, 2010

⁹Schneider et al., 2020



439.206 Uh Uhm – Filler Speech in Autistic and Non-Autistic Children

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Background:

Previous literature has investigated the differential use of filler speech (i.e., ‘uh’, ‘uhm’) as an example of social communication in autistic and non-autistic individuals. Research has suggested non-autistic children’s speech includes a greater ratio of ‘uhm’ use than autistic children. The lack of ‘um’ use has been suggested as a potential marker of pragmatic language difficulties in autism since filler speech often communicates delays in speech for utterance planning (Clark & Fox Tree, 2002; McGregor & Hadden, 2020). However, how do we quantify the ratio of ‘uhm’ to ‘uh’ use and the impact of social competence skills on autistic children?

Objectives:

To investigate if filler speech production differs in autistic and non-autistic children when it comes to ‘uh’ and ‘uhm’ use and extend previous literature by investigating the association between filler speech and social competence skills in autistic children. Our research had three hypotheses: 1) autistic and non-autistic children would not differ in their use of ‘uh’ filler words, 2) non-autistic children would use a greater ratio of ‘uhm’ filler words than autistic children, 3) greater ‘uhm’ use in autistic children would be positively correlated with social competence and negatively correlated with autistic traits.

Methods:

Twenty-eight autistic ($M_{age} = 9.51$, $SD = 2.06$; 20 male) and twenty-four non-autistic children ($M_{age} = 8.83$, $SD = 1.66$; 12 male) completed a semi-structured interview about their interests adapted from Winter-Messiers (2007). Interviews were transcribed verbatim using an abridged Jefferson (1984) model and reviewed by three researchers for accuracy. Caregivers completed the Autism-Spectrum Quotient (AQ; Baron-Cohen et al., 2001) to assess autistic traits, Social Responsiveness Scale, 2nd edition (SRS-2; Constantino & Gruber, 2012) to assess social challenges associated with autism, and the Multidimensional Social Competence Scale (MSCS; Yager & Iarocci, 2013) to assess social competence. Participants also completed the Weschler Abbreviated Scale of Intelligence, 2nd edition (WASI-II; Wechsler, 2011) to assess intellectual ability.

Results:

Data was analyzed using non-parametric Kruskal-Wallis tests. Autistic and non-autistic children did not differ in their use of ‘uh’ words ($H(1) = 1.235$, $p = .266$). Non-autistic children were more likely to use ‘uhm’ filler words ($H(1) = 18.774$, $p < .001$). In autistic children, ‘uhm’ filler word use was not associated with increased social competence ($r(26) = .146$, $p = .624$) and was not significantly correlated with autistic trait severity ($r(26) = .107$, $p = .588$).

Conclusions:

The results supported hypothesis 1 and 2, that specific filler word use (i.e., “uhm”) was higher in non-autistic than autistic children. Additionally, non-autistic and autistic children did not significantly differ in their use of ‘uh’ filler words as found previously in the literature, suggesting autistic children have difficulty with the pragmatic use of ‘uhm’ as an announcement of utterance planning. Interestingly, we did not find the expected relationship between ‘uhm’ use and increased social competency or decreased autistic trait severity. To adequately investigate the relationship of these variables in the future, studies may include several measures of social competency and autistic trait severity and include a larger sample size.

439.207 Use of Group Affiliation Language By Cisgender and Gender-Expansive Autistic Adults: A Mixed Methods Analysis

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Background: Autistic people are significantly more likely to reject cisgender identities than allistic people (Dewinter et al., 2017; Hillier et al., 2019; Moore et al., 2022). As a result of belonging to two marginalized communities (autistic and gender-expansive), many autistic individuals express concern about rejection from both communities (Hillier et al., 2019; Kanfischer et al., 2017; Strang et al., 2018). Autistic people have been found to express this concern and lower attachment to either group by using more qualified affiliation language (e.g., “I suppose” or “kinda”) than strong affiliation language (e.g., “belong” or “proud”) when talking about their communities (Nguyen et al., 2015). However, there has not yet been a rigorous investigation of affiliation language use in gender-expansive autistic people.

Objectives: To analyze affiliative language and themes of belonging used by gender-expansive and cisgender autistic adults to talk about community.

Methods: Autistic adults ($N=46$) recorded themselves talking about identity and community belonging. We used mixed methods to analyze affiliative language in these narratives. Quantitative methods include between- and within-group comparisons of strong vs. qualified affiliation language used by gender-expansive and cisgender participants. Qualitative methods include reflexive analysis of themes related to the impact of intersectionality on belonging and identity narratives.

Results: We present preliminary quantitative results based on 17 gender-expansive and ten cis-gender narratives. A 2 (group: Cisgender, Gender-Expansive) by 2 (Affiliation Language: Strong, Qualified) Repeated Measures ANOVA showed a significant effect for affiliation language ($F(1, 25) = 88.18$, $p < .001$), with both groups using more qualified than strong affiliation terms. There was no main effect for gender group ($F(1, 25) = .64$, $p = .43$), but we did identify a trend toward an interaction between gender group and affiliation language ($F(1, 25) 3.61$, $p = .069$, $\eta^2 = .13$, medium effect size). Both groups used significantly more qualified than strong affiliation words, but there was a trend for that difference being more pronounced in gender-expansive than cisgender autistic individuals. We expect more power for this analysis once the transcription of all 46 participants is complete. We are also exploring the linguistic context of affiliation word use, such as the word community appearing in strong (“we have a great community”) vs. qualified (“I might be a part of the autism community”) contexts, as well as the themes of belonging and identity via reflexive thematic analysis.

Conclusions: Findings suggest a relationship between affiliation language and gender identity of autistic adults. Both gender groups use more qualified than strong affiliation words, but gender-expansive autistic individuals have a tendency for that difference to be even greater compared to cis-gender autistic adults. This finding indicates that people who identify with two marginalized groups express a proportionally more qualified, less strong, sense of belonging to either of their communities compared with cisgender autistic individuals who identify with only one marginalized community. Thematic analysis will shed light on the experiential origins of these differences in belonging.



439.208 Vocalization Volubility in Children at Risk of Autism: Cross-Sectional and Longitudinal Comparisons Among Children with Neurogenetic Syndromes and Siblings of Autistic Children

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Background: Children with certain neurogenetic syndromes and siblings of autistic children are more likely to be diagnosed with autism. These children experience delays in language development compared to their peers (Buiting et al., 2016; Finestack et al., 2009; Robert et al., 2007). It is important that we understand how vocal development delays manifest among these populations especially during infancy and early childhood as such understanding can potentially inform improvement of assessment of language development among autistic children and implementation of relevant interventions.

Objectives: Examining whether children within these populations show different developmental profiles of early vocal development by looking at vocalization volubility.

Methods: We explored differences in vocal development trajectories of siblings of autistic children, children with Angelman, Down, and Fragile X Syndrome, and children in the low-risk-of-autism control group from the age of 4 months to 5 years. We conducted both cross-sectional and longitudinal analyses of daylong recordings collected from 224 children, focusing on the Language ENvironment analysis (LENA; Wang et al., 2020) system's automatically extracted summary vocalization volubility variables of conversational turn (CT) and child vocalization (CV). Participants' caregivers were instructed to record a typical day in their homes. The resulting recordings were 9 ~16 hours long and were representative of each participant's home language environment.

Results: Two of the multiple linear regression models in the cross-sectional analyses were: 1) CT Rate / 2) CV Rate ~ child age* group. The overall regression was statistically significant for both models, adjusted $R^2 = 0.15$, $F(9,214) = 5.5$, $p < .001$ and adjusted $R^2 = 0.24$, $F(9,214) = 8.9$, $p < .001$ respectively. For both DVs, there was no significant age-group interaction for the Autism Sibling group compared to the Low Risk group, while for all 3 neurogenetic groups there was. For the CT Rate model: Angelman: $b = -.027$, $t(214) = -4.6$, $p < .001$, 95% CI[-.039, -.016], Down: $b = -.018$, $t(214) = -3.2$, $p < .01$, 95% CI[-.030, -.0072], Fragile X: $b = -.018$, $t(214) = -2.8$, $p < .01$, 95% CI[-.032, -.0053]; For the CV Rate model: Angelman: $b = -.11$, $t(214) = -5.4$, $p < .001$, 95% CI[-.14, -.067], Down: $b = -.075$, $t(214) = -4.0$, $p < .001$, 95% CI[-.11, -.039], Fragile X: $b = -.0449$, $t(214) = -2.0$, $p < .05$, 95% CI[-0.089, -0.0013]. Two of the linear mixed effects regressions (LMMs) in the longitudinal analyses were: CT_Rate/CV_Rate ~ group + child_age + child_age * group + (1 | child_id) + (1 | group). Down and Fragile X groups did not significantly differ in CT or CV Rate across age, while there was a significant age-group interaction Angelman vs. Down/Fragile X for CV Rate, $b = -.022$, $t(203) = -2.3$, $p < .05$, 95% CI[-.039, -.0038] and $b = -.032$, $t(174) = -3.0$, $p < .01$, 95% CI[-.054, -.011] respectively.

Conclusions: Compared to the children at low risk of autism, there were significant differences in vocalization volubility in children with neurogenetic syndromes who were at higher risk for autism.



439.209 What Is the Impact of Second Language Exposure and Intellectual Disability Status on Executive Function and Functional Communication Outcomes in Children with and without Autism Spectrum Disorder?

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Background: Over the past 10 years, research has suggested no negative effect on second language exposure in children with autism spectrum disorder (ASD), yet, parents and professionals may be concerned about using a second language with a child with ASD as it may negatively impact their communication and cognitive skills, especially if the child also has an intellectual disability

Objectives: Our goal in the current study was to extend previous research in two ways: 1) to compare a large sample ($n = 396$) of children with ASD to typically developing (TD) peers who are not significantly different on socioeconomic status using parent ratings of EF and FC to see if we could replicate our preliminary results found with a smaller sample ($n = 174$) (Iarocci et al., 2017) and 2) to compare children with ASD (with and without second language exposure) who do or do not have an intellectual disability. This second aim is a unique feature of this study as children with ASD who also have an intellectual disability are typically excluded from research, including our previous research (Iarocci et al., 2017), as it was thought this condition should be considered separately.

Methods: In this study, 396 youth (5- 16 years) with and without ASD and with and without second language exposure participated in the study. Parents reported on language exposure and rated executive function (EF) and functional communication (FC) skills using a standardized questionnaire. IQ was directly measured using the WASI-II and children were classified as having an intellectual disability if they had a full-scale score of less than 70.

Results: Results showed that children with ASD and second language exposure had significantly better EF skills and were significantly less likely to have executive dysfunction in the clinical range than children with ASD with no second language exposure. Second language exposure also did not have a negative impact on EF skills in children with ASD even when an intellectual disability was present. For FC skills, we failed to find significant differences between children with ASD and second language exposure compared to children with ASD and no second language exposure. Intellectual disability was associated with having poorer FC skills; however, this pattern of results was the same regardless of whether the children were exposed to a second language or not.

Conclusions: Despite growing evidence that second language exposure does not have a negative impact on children with ASD, misconceptions persist. The current study suggests there is no evidence that functional communication and executive function are more impaired in children with ASD who have been exposed to more than one language, and our preliminary data suggest this is the case even when an intellectual disability is present. Additional research with a larger sample of children with ASD and an intellectual disability is needed to provide conclusive evidence.

439.210 Word Learning in Autism and Fetal Alcohol Spectrum Disorders: Social and Nonsocial Contexts for Learning

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Background: While social understanding is thought to play a pivotal role in vocabulary development, learning may readily occur for some children in non-social contexts when the expectations and processing demands of social interaction are removed. This may be especially pertinent to autistic children who have known social challenges. Children with fetal alcohol spectrum disorders (FASD) share many co-occurring challenges with autistic children, including in the areas of cognition, language, and social communication. There is a paucity of literature that compares word learning across social and non-social contexts in autistic children or that extends to other groups of children with disabilities that might have shared or distinct learning strengths, such as FASD.

Objectives:

The present study examined the performance of autistic children and children with FASD in word learning tasks, in a social versus a less-socially-mediated context. We assessed recognition and production of novel words in both contexts, and compared word learning across the two groups.

Methods:

Participants were 23 autistic children and 24 children with FASD (3-11 years old) who completed norm-referenced measures of receptive vocabulary and expressive vocabulary, as well as nonverbal cognition (Table 1). The groups did not differ on nonverbal IQ, $p = .279$, Cohen's $d = .27$.

Participants completed two novel word learning tasks that differed in the extent to which they provided a social context for linking labels and referents. To reduce bias due to order effects, task order (social, non-social) was counterbalanced across participants. The social context involved live, interactive exposure to novel objects presented by an examiner, who labeled each object 8 times in a child-directed manner while seated adjacent to the child; in contrast, the non-social context involved novel objects being presented on a wall-mounted screen and labeled 8 times using a child-directed recording.

Stimuli were 16 distinct novel words, with half assigned to the social context and the other half assigned to the non-social context. Word learning was measured in the same way immediately following exposure in each context via recognition (pointing) and production (labelling) probes.

Results:

For recognition, there was a significant main effect of context ($p = .016$), with a large effect size ($\eta^2 = 0.12$), indicating that performance was better in the non-social context (Figure 1). Neither the group effect ($p = .123$), nor the context by group interaction ($p = .737$) was significant.

For production, autistic participants produced a higher proportion of words correctly ($p = .014$, $\eta^2 = .133$). Neither the effect of context ($p = .331$), nor the interaction between context and group ($p = .248$) were significant.

Conclusions:

Across groups, recognition performance was statistically better in the less-socially-mediated context. Moreover, production performance was higher in the autistic group across contexts. These findings hold potential to inform future intervention studies on word learning for both autism and FASD, in exploring whether reduced social demands can facilitate better learning of words. Despite the focus on social prerequisites in many language intervention approaches, it may be warranted to focus on relative strengths for autistic children and children with FASD (e.g., nonsocial contexts), shifting away from deficit-based perspectives.



439.211 'Uh Huh': Backchanneling By Autistic and Neurotypical Teens and Their Caregivers in a Collaborative Task

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Background: Backchannels (i.e., *mhm, okay*) signal and promote engagement, attention, and agreement between interlocutors.[1] Backchannels are socially important because they influence perceived communicative success, establish mutual understanding, and influence subjective judgements between conversational partners.[1] At least for neurotypical (NT) dyads, backchannel use varies by context and is more frequently used in affiliative than in task-oriented conversations.[2] Autism is associated with challenges in social interactions throughout development,[3] so autistic individuals might backchannel differently. In one study involving autistic and NT adults in same-neurotype dyads (ASD-ASD, NT-NT) while engaging in a collaborative task, autistic adults produced fewer backchannels per minute and fewer backchannel types compared to NT adults.[1] However, these interlocutors did not know each other, whereas autistic individuals with familiar conversation partners might produce more backchanneling.

Objectives: To deploy an ecologically valid approach investigating similarities and differences in how autistic and neurotypical teens and their caregivers use backchannels while talking in a family setting.

Methods: Participants included 15 autistic and 15 NT adolescents (Table 1) from an ongoing longitudinal study that had matched them on their expressive language at 18-30 months of age.[4] As teens, they completed a collaborative video game (the Aliens game[5]) where caregiver-teen dyads discussed whether each of 40 aliens was good or bad and had a gem or didn't. Participant and caregiver speech was recorded and transcribed by trained research assistants in Datavyu.[6] Transcripts of both teen and caregiver speech were analyzed in CLAN[7] to identify number of utterances. Backchannels were identified from the transcripts and confirmed by reviewing the videos. To account for differences in verbosity, analyses were conducted on the proportion of backchannel tokens to utterances, and the number of backchannel tokens per minute.

Results: Teens and their caregivers produced a roughly comparable number of backchannel tokens across diagnostic groups during the approximately 20-minute interaction. NT teens and their caregivers tended to produce more backchannels per minute compared to autistic teens and their caregivers, (2 vs. 1 per minute, respectively $ps < .10$, Table 1). Out of the five backchannel types identified (*yeah, okay, uh huh/mhm, right, alright*), autistic teens produced significantly fewer than NT teens ($p < .01$, Table 1; primarily *yeah* and *okay*). Moreover, within the ASD group, teens who produced more backchannel types had caregivers who produced more backchannel types (Figure 1).

Conclusions: These findings provide replication, extension, and potential context to previous reports of less backchanneling in autistic adults. In particular, fewer backchannel types were observed in these autistic teens while conversing with their familiar caregivers during a collaborative task. Moreover, caregiver and teen backchannel types were correlated in the ASD group, raising intriguing questions about proximal (during this interaction) and distal (across the teen's lifetime) influences, as well as bi-directionality. Future analyses will consider backchanneling in conversations between these dyads when the teens were preschoolers.

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439.212 Speech-Language Pathologists' Perceptions of Gestalt Language Processing/Natural Language Acquisition

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Background: Among speech-language pathologists (SLPs) who work with autistic children, there has been a recent rise in the popularity of gestalt language processing/natural language acquisition (GLP/NLA). GLP is “a style of language acquisition that begins with larger chunks of language, as opposed to the traditional style of language acquisition...that begins with single words” (Blanc et al., 2023, p. 2). The NLA protocol is “a description of the six stages of gestalt language development...and a documentation of the natural supports that allow students to progress through the stages...” (Blanc et al., 2023, p. 3). Despite its popularity, there are growing concerns that GLP/NLA incorporates some concepts and recommendations that are theoretically and empirically unsupported (Evans, 2022; Hutchins, Knox and Fletcher, 2024; Venker and Lorang, 2024). **Objectives:** Given the popularity of (and controversy surrounding) GLP/NLA, the objective of this study was to better understand SLPs’ perceptions of GLP/NLA.

Methods: We conducted face-to-face, semi-structured interviews with 12 SLPs. SLPs were asked to describe GLP/NLA and discuss whether and how they use it in their practice. On average, interviews lasted 13 minutes ($SD = 11$). We analyzed the data using reflexive thematic analysis (Braun and Clarke, 2006). We developed codes using an inductive, data-driven approach and then organized the codes into themes.

Results: We identified four primary themes.

1) Differing impressions. SLPs’ impressions of GLP/NLA varied widely, leading us to categorize them as Embracers, Skeptics, and Neutral SLPs. One Embracer (SLP 342) said, “I love [GLP/NLA]...I think it’s really monumental...” Another Embracer (SLP 341) said, “I think it’s really opened my eyes to how a lot of our learners communicate and just a way for them to process language.” One Skeptic (SLP 340) said, “I feel like it’s a lot of, like, much ado about nothing, I guess.”

2) Clinical starting point. Embracers’ positive impressions of GLP/NLA were frequently associated with a starting point of discontent, wherein they felt frustrated by a lack of progress and uncertain what to do next. Skeptics and Neutral SLPs did not mention feeling stuck.

3) Experiences implementing GLP/NLA. Embracers described positive experiences implementing GLP/NLA (e.g., increased rapport). Embracers also described negative experiences (e.g., difficulty interpreting gestalts, discomfort using ungrammatical language).

4) Professional and outside influences. SLPs commonly mentioned the popularity of GLP/NLA. One Neutral SLP (SLP 347) described GLP/NLA as a “buzzword” and said that she felt “kind of embarrassed” she did not know more about it. One Embracer (SLP 342) said that her clients’ parents are seeing GLP/NLA content on social media and taking courses on it. Another Embracer (SLP 345) said parent advocacy led her to prioritize GLP/NLA in professional development.

Conclusions: Some SLPs expressed enthusiasm about GLP/NLA, and some expressed skepticism. It was notable that positive experiences implementing GLP/NLA usually related to the use of general, responsive strategies (e.g., child-led therapy), whereas negative experiences related to strategies unique to GLP/NLA (e.g., identifying stages). An important next step is determining what specific strategies SLPs use when they report that they are implementing “GLP/NLA.”

439.213 Affect Production and Psychosocial Functioning in Children with Autism Spectrum Disorder (ASD)

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Background: Autism spectrum disorder (ASD) can be associated with difficulties in expressing emotions through facial and vocal affect; however, little research has been dedicated to understanding the impact of these difficulties on social/emotional and adaptive functioning.

Objectives: This study examined the relationship between facial and vocal affect production and parent-reported internalizing, externalizing, and adaptive behaviors in children with ASD. This study is the first to evaluate how the ability to intentionally communicate a desired affective state is related to social and emotional outcomes in children with autism.

Methods: Participants were 88 children (ASD = 55; TDC = 33) aged 8 to 17 years who scored at least 80 on the Clinical Evaluation of Language Fundamentals-5th Edition (CELF-5) Receptive Language Index (RLI). This cutoff was applied to ensure that participants had sufficient receptive language abilities to meet task demands. Parents of participants completed the Behavior Assessment Scale for Children-3rd Edition (BASC-3) to derive scores on the Social Skills, Functional Communication, and Withdrawal scales and the Internalizing and Externalizing Composite scores. Participants were administered a novel affect production task which required them to produce facial and vocal expression of specified emotions happy, sad, angry, or afraid) in response to a prompt. Responses were audio/video recorded and classified as happy, sad, angry, afraid, or neutral by raters blinded to the emotion prompted. Affect production abilities were quantified by agreement between the prompted emotion and the emotion selected by the rater. Group differences in affect production and psychosocial functioning were assessed using Mann-Whitney U tests. Bivariate nonparametric correlation analyses examined associations between overall facial and vocal affect production accuracy and BASC-3 domains. **Results:** Significant group differences were found in BASC-3 Externalizing Composite ($U = 3882.500$, $p < .001$), Internalizing Composite ($U = 3675.500$, $p < .001$), Social Skills scale ($U = 1089.500$, $p < .001$), Withdrawal scale ($U = 4131.500$, $p < .001$), and Functional Communication scale ($U = 639.000$, $p < .001$). No significant differences were found in vocal affect production ($U = 731.500$, $p = .626$); however, the TDC group was more effective in conveying affective states via facial expression ($U = 707.500$, $p = .014$). Facial affect production was significantly correlated with parent reported anxiety ($Rho = .364$, $p = .006$), depression ($Rho = .276$, $p = .042$), overall internalizing symptoms ($Rho = .301$, $p = .026$), and social skills ($Rho = .396$, $p = .003$). Vocal affect production was significantly correlated with functional communication ($Rho = .357$, $p = .010$) and withdrawal ($Rho = -.388$, $p = .005$).

Conclusions: These findings suggest that affect production abilities impact social emotional functioning and/or parental perceptions thereof in autistic youth. Notably, autistic youth who were able to effectively communicate facial affect were more likely to have their emotional distress recognized by parents, highlighting the role of visible emotional cues in parent-report measures. This emphasizes the need for comprehensive risk assessment, particularly in a population with elevated internalizing symptoms and suicide risk.

439.215 An Expansive Approach to Assessment of Novel Word Acquisition in Autistic Children

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Background:

Language assessment seeks to quantify skills and knowledge that individuals possess, often for the purpose of identifying areas that would benefit most from intervention. Yet, children's verbal participation and compliance influence scoring outcomes, which can disproportionately challenge autistic children (Fipp-Rosenfield et al., 2024). Use of nonverbal response modalities (e.g., eye-gaze) enhances autistic children's participation in research, as well as researchers' and clinicians' understanding of their receptive vocabulary knowledge (Brady et al., 2014). However, individual children vary on what response modalities optimize receptive performance (e.g., eye-gaze, pointing; Skwerer et al., 2016). We extend previous research by implementing an expansive coding scheme that captures participants' responses (e.g., eye-gaze, point) regardless of the modality cued by the examiner. This approach may allow more flexibility in assessment protocols, reduce data loss, and encourage strengths-based framing of autistic children's language knowledge.

Objectives:

We present an expansive coding scheme for the assessment of receptive word knowledge, report rates of data missingness, and compare variation from cued response modalities for autistic and neurotypical (NT) children.

Methods:

Exploratory analyses were conducted on an existing dataset of 25 autistic children (2-11 years old, $M=7.1$, $SD=1.7$) and 32 NT children (2-7 years old, $M=4.5$, $SD=1.2$) who completed a remotely administered storybook-listening word-learning task. To score word learning assessments, coders were trained to make a judgment of the child's selection of a target object from an array of two, based on any observable behavior. Coders noted the child's selection (correct, incorrect) and the behavior that they (the coder) utilized as the basis of their judgment (e.g. eye-gaze, point, or cannot judge). Reliability for accuracy was high ($\kappa = 0.82$); reliability for behavior judgment is in progress. Responses were further classified as cued (e.g., gaze, when asked to look) or non-cued (e.g., point, when asked to look) modalities.

Results:

Regarding missingness, across 769 trials where children were cued to look at the target, only 126 trials were not scorable (e.g., examiner error, child stated 'I don't know'; 14% of autistic group trials, 18% of NT trials; no significant difference). Regarding response modalities, group and use of cued response modality were significantly associated (Fisher's exact test): autistic participants used more non-cued responses (e.g., pointing, when cued to look) than NT participants. This was the case both across all trials that elicited a scorable response ($p<.001$) and considering only trials with correct responses ($p<.001$); thus, modality distribution does not appear to be a function of accuracy.

Conclusions:

Autistic children may use additional response modalities beyond what is cued to indicate their receptive word knowledge. Additional analyses will examine this expansive scoring scheme for tasks that cue pointing rather than looking. Findings also suggest that this expansive scoring scheme allows for minimal data missingness across groups, which we will compare to traditional schemes. This work sheds light on scoring approaches that estimate autistic children's vocabulary knowledge with less reliance on behavioral compliance with specific response modalities.

439.216 Investigating Caregiver Linguistic Input Provided to Infants at Elevated Familial Likelihood for Autism in Families from India

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Background: Infant siblings of autistic children (EL-A) are three to four times more likely to exhibit language delay¹ and social communication difficulties compared to infants at typical likelihood (TL), i.e., having an older neurotypical sibling. Caregiver linguistic input (CLI) is among the key factors influencing language development in infants.² Comparative studies of EL-A and TL infants indicate differences in quantity and quality of CLI such as word counts, mean length of utterance, conversational turns and directiveness.² However, findings related to these differences (a) have not been consistent, (b) have been reported only in broad aspects of CLI (e.g., word token and directiveness) and not comprehensive aspects (e.g., nouns, verbs or attention directives) despite literature and clinical knowledge highlighting their importance in infants language development,² and (c) have been documented predominantly in western contexts although CLI can vary with culture and ethnicity.³ This preliminary study in India aims to investigate these gaps by examining a sample of EL-A and TL infants.

Objectives: To evaluate (a) differences in the quantity and quality of CLI (b) association between CLI and concurrent language abilities, in infants between 9-15 months of age.

Methods: Home-recorded caregiver-infant free play videos were obtained from 33 EL-A; [M= 10.97 (3.04)], and 15 TL; [(M= 12.42 (4.23)], infants (Table 1a). Videos were coded for quantity and quality of CLI using a study-specific modification of an existing system³, including 18 parameters focused on pragmatic language functions essential for fostering infants' social engagement (Figure 1). ATLAS.ti (v23.2.1), was used to annotate video transcriptions. A subsample (20%) was annotated by another coder for inter-rater reliability.

Quade's ANCOVA controlling for age was used to assess group differences and Spearman partial correlation to assess association between CLI and infant language abilities.

Results: Objective 1: Significant group differences were observed in three CLI parameters: attention directives (EL-A>TL) ($F= 10.09$ $p=.003$), prohibitions (EL-A<TL) ($F= 19.23$ $p<.001$) and exclamations (EL-A<TL) ($F= 18.98$ $p<.001$). Although not coded, increased object engagement over social engagement, fewer initiations⁴ and reduced social reciprocity⁵ in infants could be potential reasons.

Objective 2: Significant positive correlations were found between total words, verbs, and utterances and infants' receptive and expressive vocabulary and language abilities as measured on MCDI and VABS respectively. Word type was associated with words spoken on MCDI. Further, a negative correlation was obtained between type-token ratio and language abilities on VABS (Table 1b). These findings align with existing literature² indicating repetitive labelling of objects, actions, and events support infants' language abilities. However, no significant correlations were found between qualitative CLI parameters and infant language abilities, requiring further investigation.

Conclusions: Despite the small sample size, this annotation-intensive study revealed subtle variations in caregiver linguistic input (CLI), which may not be detected when focusing solely on broader aspects of CLI. Future research with larger samples and longitudinal design considering other infant and caregiver factors (e.g., caregivers education) may offer deeper insights into CLI and its impact on infants' language abilities and subsequently help inform interventions.



439.217 Parental Perspectives on Choosing a Monolingual or Bi/Multilingual Environment for Their Autistic Children Growing up in a Bilingual Environment in India

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Background: Recent studies have indicated that bilingualism does not negatively impact language development in autistic children, and may even serve as a protective factor against some cognitive and communication difficulties associated with autism.¹ Yet from studies in other parts of the world² and our own clinical experience³, parents of autistic children have expressed concerns that bilingualism may confuse their child and that it may cause additional language delays. This assumption may be especially harmful for children in bilingual environments like India, where exposure to multiple languages is an integral part of life.⁴ However, in a country as linguistically diverse as India, the roots of these beliefs and opinions on bi/multilingual exposure for autistic children are unknown.

Objectives: The study asked parents of autistic children growing up in bi/multilingual environments (a) their preferred choice of language environment (monolingual or bi/multilingual) for their child and, (b) their reasons for preferring a monolingual environment or a bi/multilingual environment. The study also evaluated whether there were differences in socio-economic status, parental education, communication mode, child receptive and expressive language abilities, and autistic symptom severity among parents that preferred a monolingual environment versus those who preferred a bi/multilingual environment.

Methods: A survey questionnaire was administered to 102 parents of 2-6 year-old autistic children exposed to two or more languages. Parents were recruited from a tertiary care hospital for mental health and neurosciences in Bengaluru city, India. Although the survey was administered to the parents in English, Kannada, and/or Hindi, their children were exposed to a variety of other languages (e.g., Bengali, Tamil, Telugu). Language abilities and autism severity were evaluated using the Receptive and Expressive Emergent Language Scale (REEL-3) and Childhood Autism Rating Scale (CARS-2), respectively.

Results: See Table 1 for sociodemographic data and analysis results. Mean age of children was 52.11 months (SD=11.77); female n=25 (24.5%). The survey was completed by 70 mothers ($M_{Age}=33.92$ years, $SD=5.08$) and 32 fathers ($M_{Age}=37.5$ years, $SD=5.52$). Nineteen (18.62%) parents preferred/wished they chose a monolingual environment and 83 (81.37%) preferred to continue to raise their child in a bi/multilingual environment. Top reasons that parents preferred a monolingual environment included: learning two languages would be hard for the child and fear that the child will be confused by two languages. Key reasons that parents preferred a bi/multilingual environment included: to help communicate with people in school, with family members, with people in the neighbourhood, and because parents were living in a bilingual/multilingual city and country. See Table 2 for more details. Controlling for age, children of parents who preferred a monolingual environment had lower expressive language scores ($M=24.47$, $SD=12.28$) than parents who preferred a bilingual environment ($M=33.44$, $SD=13.27$). There were no statistically significant differences in socio-economic status, parental education, mode of communication (parent report), receptive language abilities, or autism severity.

Conclusions: In this study, one of the first from India, most parents preferred bi/multilingual environments for their autistic children, unlike previously reported.^{1,2} Future analyses will explore how child- internal and external factors influence parents' decisions.



Poster Session**440 - Diagnostic, Behavioral & Intellectual Assessment II**

May 3rd, 2025, 12:30 PM - 1:30 PM - Hall 4A

440.218 Improving the Screening to Treatment Pathway for Autism with Telehealth

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Background: Barriers to the screening-to-treatment pathway include variability in pediatrician screening and referral procedures, availability of skilled professionals to conduct evaluations, and challenges securing an autism treatment program. Telehealth options for screening and evaluation present a promising solution; however, they have not yet achieved widespread acceptance. In 2015, the Naturalistic Observation Diagnostic Assessment (NODA) was developed and validated. NODA aligned with an in-person evaluation in 88% of cases (Smith et al., 2017) Usability among clinicians was favorable (Nazneen et al., 2015). While NODA provides valuable behavioral examples, practical application in diagnostic services requires a comprehensive developmental history to enhance clinician confidence in diagnosing ASD. Thus, a live interview component was added to allow raters to gather evidence in real time. NODA-E (video review plus interview) was recently validated against the in-person assessment (Morrier et al., 2024). NODA-E paired with a telehealth system for screening and referring children, CHADIS, it is possible to overcome some of the barriers in this pathway.

Objectives: The current study aims to evaluate the time-saving advantages of this streamlined screening-to-treatment pathway.

Methods: Pediatricians in Arizona, California, and Idaho used CHADIS to screen 140 families electronically referred participants to a local study site. All procedures received approval from the Western Copernicus Group IRB. After consent, in Arizona only, families were randomized into either the Telehealth group or the Community group (Table 1). California and Idaho families completed only the telehealth procedure. To avoid bias associated with study participation, families in the Telehealth group were given the next available appointment with a diagnosing psychologist and completed three procedures: 1) recording four videos of the child at home to capture social communication and play behaviors (Smith et al., 2015); 2) completing an ABAS assessment through CHADIS; and 3) participating in a developmental history interview with a psychologist using the NODA-E platform. A diagnostic report was securely shared with parents through the NODA system. The Community group received a list of local providers to schedule evaluations independently. Both groups were contacted by study staff and sent reminders through CHADIS to regularly track progress, with milestones recorded via brief questionnaires. Significant attrition was observed in both groups. Nonparametric statistics were used to compare groups due to violations of normality.

Results: Participant attrition was indicated by significant differences in sample size in the Telehealth and Community groups for each dependent variable (Cochran's Q = 114.75, df = 3, p < .001; and 75.83, df = 3, p < .001). To preserve sample size, separate group comparisons were conducted, and alpha was corrected for multiple comparisons. Group comparisons revealed significant differences for the days between screening and evaluation, report, and treatment (p < .001), indicating that the telehealth procedure significantly reduced the screening-to-treatment pathway (Table 2).

Conclusions: Significant differences were found in the time between screening and scheduling evaluations, receiving reports, and enrolling in autism treatment between the Telehealth and Community groups. However, high attrition rates suggest challenges for families in both groups, indicating a need for larger studies to identify barriers in the screening-to-treatment pathway for children with autism.

**440.219 Influence of Co-Occurring ADHD on the Ability of a Digital Phenotyping App to Detect Behavioral Signs of Autism**

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Background:

While signs of autism can be observed during infancy, the time between onset of first signs and diagnosis can be lengthy, delaying services and intervention. Thus, there is a need for accurate, scalable methods for autism screening. Furthermore, autism frequently occurs alongside other conditions, such as attention-deficit/hyperactivity disorder (ADHD). Thus, validation of autism screening tools in children with co-occurring conditions is essential. We have previously shown that SenseToKnow, a digital phenotyping app which is designed to detect signs of autism, can be used to accurately detect autism in primary care settings and remotely at home. The app requires only a smartphone or tablet, using video of the child's behavioral responses collected from the device's front-facing camera. The video is analyzed using computer vision to automatically compute clinically relevant features such as social attention, facial expressions, and motor responses. In this work, we describe the use of the SenseToKnow app in preschool- and school-aged children who are diagnosed with autism alone, ADHD alone, or co-occurring autism and ADHD, compared to neurotypical children.

Objectives:

To compare the computer vision-based behavioral features derived from the SenseToKnow app across four groups of children: (1) autism, (2) ADHD, (3) co-occurring autism and ADHD, and (4) neurotypical.

Methods:

SenseToKnow, which is comprised of a series of strategically designed brief movies, was administered on an iPad in a clinical setting. The sample consisted of 181 participants, 40-100 months in age, as follows: 41 neurotypical, 51 autistic, 48 ADHD, and 41 autism and ADHD. Participants' behavioral responses were recorded using the tablet's front facing camera and analyzed with computer vision to quantify response to name, gaze, head movement metrics, facial movements, attention (facing forward), and blink rate.

Results:

Analysis of covariance (ANCOVA) with age as a covariate revealed significant group differences ($p < .05$) between autistic and non-autistic participants (Table 1). In contrast, we found no significant differences ($p > .05$) in any feature between those with autism alone and those with co-occurring autism and ADHD. Significant differences ($p < .05$) were found between neurotypical and ADHD participants for all features in response to nonsocial movies, as well as gaze silhouette score, a measure of gaze focus. Linear modeling of each feature comparing autistic (excluding co-occurring ADHD), ADHD, and neurotypical participants with age as a covariate indicated that autism status had a significantly stronger impact on feature outcome than ADHD status across all features, except for response to name delay, when compared to the neurotypical group (Figure 1).

Conclusions:

The SenseToKnow app can effectively distinguish neurotypical children from those with autism, ADHD, and co-occurring autism and ADHD. Additionally, the presence of autism has a significantly greater impact than the presence of ADHD on the majority of app-extracted features. These findings, together with prior work, further encourage the use of SenseToKnow to detect autism signs in children.

**440.220 Initial Use and Diagnostic Accuracy of the Tele-ASD-PEDS-Preschool (TAP-P)**

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Background: The wait for autism evaluation increases substantially with age, with wait times of a year or more common as children reach preschool. Even when appointments become available, families from traditionally underserved groups struggle to access care. Telemedicine has presented an alternate pathway for diagnostic assessment of toddlers with concerns for possible autism, yet addressing care disparities requires designing identification tools and processes specifically for and with individuals most at-risk for health inequities. This work evaluates the use of a novel telemedicine-based autism assessment tool for the preschool age range: the TELE-ASD-PEDS-Preschool (TAP-P), a play-based instrument with administration activities and scoring procedures based on the child's language level (i.e., TAP-P Verbal, TAP-P Non-verbal).

Objectives: To evaluate use of the TAP-P, assessing diagnostic concordance with in-person evaluation and understanding family and clinician perceptions.

Methods: Participants were children (28% female, 72% male, 42% identifying as from a racial or ethnic minority background) aged 36-71 months ($m = 47.8$ months, $SD = 9.90$) referred for autism-focused evaluation by primary care providers, early intervention teams, or by family self-referral. Participants completed in-home tele-assessment visits with a licensed psychological provider, including administration of the TAP-P, clinical interview, and developmental assessment using the Developmental Profile 4 (DP-4). Clinicians documented diagnostic impressions immediately following tele-assessment. All participants completed in-person assessment with a different psychological provider unaware of tele-assessment impressions. In-person assessment included developmental (Mullen Scales of Early Learning) or cognitive (Differential Ability Scales, Second Edition) assessment, adaptive behavior assessment (Vineland Scales of Adaptive Behavior, Third Edition), and administration of the Autism Diagnostic Observation Schedule (ADOS-2). Following in-person assessment, clinicians documented their diagnostic impressions and shared diagnostic feedback with families. Caregivers completed brief questionnaires following tele- and in-person assessment to share their feedback. **Results:** In total, 116 participants completed both tele- and in-person assessment ($n=2$ completed only tele-assessment). When asked to make a binary decision about the presence or absence of autism, tele-assessment and in-person clinicians agreed for 82% of cases (TAP-P Verbal: 76%; TAP-P Non-verbal: 89%). When given the option to select "unsure," tele-assessment clinicians reported uncertainty for 28% of participants in the TAP-P NV group and 52% of the TAP-P V group. Overall, tele-assessment clinicians reported stronger diagnostic certainty for children assessed using the TAP-P NV ($m = 3.11$, $SD = 1.07$) than the TAP-P V ($m = 2.61$, $SD = 0.86$), $t(113) = 2.78$, $p < .05$. Families reported broad satisfaction with tele-assessment procedures, with 87% indicating "very true" when asked whether they would recommend this kind of tele-evaluation to others.

Conclusions: This work represents an extension of prior research suggesting that clinicians can confidently and accurately identify autism over telehealth in preschool-aged children, particularly for children with limited verbal ability. These findings also identify important considerations and future directions for tele-assessment of verbal, phenotypically complex children, including adaptations designed to increase clinician certainty while preserving caregiver satisfaction and meaningful utilization of the TAP-P as one tool within existing systems to effectively identify concerns in preschool children facing disparities in access to diagnostic care.



440.221 Identifying Early Motor Patterns of Autism through Free Play: Validation of a Smart Toy for Preschoolers

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Background:

One way to identify early signs of Autism Spectrum Disorder (ASD) is by observing children's motor behaviors during object manipulation in play. To enhance this process, this study introduces a novel Internet of Things (IoT) enabled smart toy, designed to serve as a screening tool. The toy can be used during free play, providing objective data on children's motor behaviors in natural environments. This approach aims to improve the early screening process, offering specialists valuable insights into motor patterns that may indicate the presence of ASD.

Objectives:

The study's primary objective is to assess the effectiveness of the smart toy in identifying early motor signs of ASD and to support specialists in the screening process. Specifically, the toy captures data on children's object manipulation behaviors during free play to analyze movement patterns that may distinguish ASD from Typical Development (TD). Additionally, the study aims to validate the use of neural network models for classifying these movement patterns based on key motor variables.

Methods:

This study involved 100 preschoolers (50 ASD; 50 TD). The ASD group included children with varying degrees of autism severity and developmental levels. Each child interacted with the smart toy, 3 minutes, which was equipped with sensors that tracked movement. The data were analyzed based on four primary motion variables: **Acceleration** (changes in toy speed), **Pitch** (rotation on the transverse axis), **Roll** (rotation on the longitudinal axis), and **Yaw** (rotation on the vertical axis). Two neural network models—Time Delay Neural Network (TDNN) and Recurrent Neural Network (RNN)—were applied to classify the movements. Overfitting detection was based on validation accuracy, and models were optimized using grid search techniques. TDNN optimization focused on filter numbers and kernel size, while RNN was optimized by adjusting the number of units in the recurrent layer.

Results:

Distinct movement patterns were observed between ASD and TD children. For ASD children, **Acceleration** showed oscillations tending towards zero, while **Pitch**, **Roll**, and **Yaw** demonstrated instability, with large yaw peaks exceeding $\pm 150^\circ$. These children exhibited continuous toy movement, with low acceleration and leftward longitudinal rotations, combined with significant vertical oscillations to the right and left. In contrast, TD children displayed more controlled movement patterns: **Acceleration** oscillated around zero with peaks near 50, while **Pitch** and **Roll** remained stable and low. **Yaw** exhibited only minor fluctuations. TD children applied more movement at the beginning and end of play sessions, with a vertical tilt to the right, while the toy remained stable in the middle of the session.

Conclusions:

The smart toy demonstrates strong potential as a non-invasive tool for early ASD screening by providing objective, naturalistic observations of motor behaviors during free play. The distinct movement patterns identified in ASD children, characterized by continuous movement and unstable yaw values, contrast with the more stable behaviors of TD children. The neural network models (TDNN and RNN) were effective in classifying these behaviors, offering a valuable data-driven approach to support screening. Future research will focus on refining the models and validating this technology in larger, more diverse populations to enhance early ASD detection.



440.222 Investigating Factors Linked to Research-Confirmed Diagnosis of Autism Spectrum Disorder in Children Referred for Diagnosis in a Research Study: Results from the Autism Biomarkers Consortium for Clinical Trials (ABC-CT)

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Background: The prevalence of autism spectrum disorder (ASD) has increased, with the CDC reporting 1 in 36 children diagnosed (Maenner, 2023). Despite improved diagnostic reliability, concerns about over- and under-diagnosis remain (Berg, 2018). Increased awareness may lead to false positives, which could be reduced through gold-standard assessments (Duvall, 2022). Duvall et al. (2024) found that 47% of children with community-based ASD diagnoses didn't meet rigorous research diagnostic criteria. This study aims to replicate these findings using the Autism Biomarkers Consortium for Clinical Trials (ABC-CT) dataset.

Objectives: This study investigates the characteristics associated with research-confirmed diagnosis of ASD in children referred to participate in the ABC-CT. We compared groups of ASD+ (children recruited in the ASD path of the study who met research diagnostic criteria) and ASD- (children who did not meet research diagnostic criteria). Research diagnosis of ASD was defined as meeting criteria on the Autism Diagnostic Observation Schedule-2 (ADOS-2), the Autism Diagnostic Interview – Revised (ADI-R), and expert clinical judgement using the Diagnostic and Statistical Manual-5 (DSM-5). Per Duvall et al. (2024), we predicted that the ASD- group would have higher levels of internalizing and externalizing symptoms (Child & Adolescent Symptom Inventory-5 (CASI-5)), and higher Full Scale Intelligence Quotient (FSIQ) scores than children in the ASD+ group.

Methods: Analyses were conducted on a sample of 317 youth recruited in the ASD path of the ABC-CT. The ASD+ group included 280 children (65 female; $M_{age} = 8.43$, $SD_{age} = 1.66$; $M_{IQ} = 96.6$, $SD_{IQ} = 18.1$) and 37 children were in the ASD- group (11 female; $M_{age} = 8.47$, $SD_{age} = 1.41$; $M_{IQ} = 103$, $SD_{IQ} = 15.6$). Independent sample t-tests compared FSIQ, verbal IQ, non-verbal IQ, age, and internalizing and externalizing symptoms (CASI-5 subdomain t-scores) in the ASD+ and ASD- groups. Sex distribution was compared between groups using chi-square tests.

Results: Overall, children in the ASD- group had higher verbal IQ than children in the ASD+ group ($t(305) = 2.23$, $p = 0.02$, $d = 0.48$). The ASD- group had marginally higher FSIQ than children in the ASD+ group ($t(304) = 1.69$, $p = 0.09$, $d = 0.36$). Non-verbal IQ, CASI-5 t-scores, age, and sex did not differ significantly between groups (all p 's > 0.1).

Conclusions: Consistent with our hypotheses, the ASD- group demonstrated higher verbal IQ scores than those in the ASD+ group, indicating that youth with stronger verbal abilities may be more at risk for misdiagnosis of ASD. This study employs the ADI-R which is based on DSM-4 criteria, requiring communication difficulties. Thus, children with stronger communication skills who would have met DSM-5 criteria may have been excluded. Alternatively, clinicians may have less experience with the differential diagnosis of ASD in highly verbal children contributing to over-diagnosis. In contrast to our hypotheses, groups did not differ in their level of internalizing or externalizing symptoms or by demographic characteristics. Limitations include the use of a convenience sample not designed to evaluate accuracy of community diagnoses, small sample size, and missing data in the ASD- group. Future investigations would benefit from using multiple data sources to compare psychiatric symptoms across groups.



440.223 Investigating the Role of Neurodevelopmental Factors on Adaptive Function in Autism Spectrum Disorder

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Background: Neurodevelopmental conditions, including autism, are heterogeneous and overlapping disorders that affect more than one million children in Canada. A key determinant of outcomes in these conditions is adaptive functioning, or the ability to independently perform the skills needed to function in daily life (e.g., avoiding danger, managing money, toileting, food handling). Adaptive functioning profoundly impacts long-term outcomes such as academic achievement, employment, independent living, and healthcare use. Adaptive functioning difficulties remain a major barrier to activity participation and achieving positive outcomes. To improve this, there is a critical need to understand the factors that contribute to adaptive functioning to enable the development of timely and targeted supports.

Objectives: This study seeks to examine the association between cognitive, phenotypic, demographic, and genetic factors and adaptive functioning in individuals with autism, using data from the Province of Ontario Neurodevelopmental Disorders (POND) network. The goal is to identify predictors of adaptive function that could guide future personalized approaches to support.

Methods: Data were analyzed from 376 participants, aged 6–21 years, who had a diagnosis of autism (mean age [SD] = 11.04 [3.32] years, 303 males, 73 females). Adaptive functioning was measured using the General Adaptive Composite (GAC) score from the Adaptive Behavior Assessment System-II (ABAS-II). Cognitive abilities were assessed using the full-scale IQ (FSIQ) from the Wechsler scales. Phenotypic measures included social communication skills (Social Communication Questionnaire, SCQ), ADHD symptoms (Strengths and Weaknesses of ADHD Symptoms and Normal Behavior Scale, SWAN), OCD symptoms (Toronto Obsessive-Compulsive Scale, TOCS), and mental health symptoms (Child Behavior Checklist, CBCL). Sociodemographic variables, such as sex and age, were also included. Polygenic scores (PGSs) for 19 different phenotypes—including ADHD, anxiety, autism, and others—were calculated using the SBayesR method, adjusting for genetic ancestry via population principal components. A gradient boosting machine learning model was employed to predict the GAC score from (1) phenotypic, cognitive, and demographic data, and (2) phenotypic, cognitive, demographic, and polygenic scores.

Results: The phenotypic, cognitive, and demographic model achieved a R^2 score of 0.51, a root mean square error (RMSE) of 11.20, and a mean absolute error (MAE) of 8.34. The top three predictive features were FSIQ, SCQ total scores, and SWAN inattentive traits. When PGS features were included, prediction accuracy was maintained ($R^2=0.51$, RMSE=11.19, MAE= 8.24). The same three features remained the most influential, suggesting that PGS scores did not contribute significantly to predicting adaptive functioning with the current sample size.

Conclusions: This proof-of-concept study demonstrates the potential of machine learning to predict adaptive functioning in autism. The results highlight the role of IQ, social communication differences, and inattentive traits in adaptive functioning.

440.225 Item-Level Analyses of M-CHAT-R and ADOS-2: Concordance and Discrepancies between Caregiver and Clinician Observations

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Background:

Autism spectrum disorder (ASD) is a childhood neurodevelopmental disorder often diagnosed in toddlers. Early caregiver screening for ASD is often the first step in initiating a diagnostic evaluation. However, caregivers and clinicians may differ on their perception of specific ASD symptoms and studies are mixed on caregiver and clinician agreement (Macari et al., 2018; Sacrey et al., 2018). The symptom domain may matter; caregivers are more likely to identify social deficits compared with repetitive behavior (Goodwin et al., 2019).

Objectives:

To our knowledge, limited research has compared ratings on similar symptoms across commonly used measures for autism screening and diagnosis: the Modified Checklist for Autism in Toddlers-Revised (M-CHAT-R; Robins et al., 2009) and the Autism Diagnostic Observation Schedule, Second Edition (ADOS-2; Lord et al., 2012). The present study compares item-level scores on these measures to identify differences in caregiver and clinician observation of autistic symptoms.

Methods:

Data collection is ongoing. Participants included 51 children aged 12-30 months ($M = 23.20$ months, $SD = 5.22$) who underwent diagnostic evaluation for autism (33 boys, 17 girls, 1 missing). Prior to the diagnostic assessment, caregivers completed the M-CHAT-R. Clinicians administered the ADOS-2 during the evaluation. Similar items across measures were chosen by 2-3 examiners familiar with both the M-CHAT-R and ADOS-2 by examining language used in each tool, focusing on key phrases such as "unusual movements," and "response to name" to highlight overlap. Independent chi-square analyses were conducted to explore the relationships between similar items on the M-CHAT-R and ADOS-2 item-level scores (converted to binary to align with the M-CHAT-R).

Results:

Across all analyses, parents and clinicians generally agreed when a skill was considered typical. However, discrepancies emerged in the identification of atypical skills. For pretend play, a statistically significant number of discrepancies were found when parents did not report this skill as atypical on the M-CHAT-R, while clinicians identified it as atypical during the ADOS-2 ($\chi^2(1) = 5.68$, $p = .017$). A similar pattern was observed for pointing, with a statistically significant number of discrepancies for requesting ($\chi^2(1) = 5.63$, $p = .018$) and for social pointing ($\chi^2(1) = 8.59$, $p = .003$). For ratings regarding showing, (i.e., holding up objects to orient towards others), clinicians identified significantly more cases as atypical compared to parents ($\chi^2(1) = 9.89$, $p = .002$). Several other comparisons (e.g., Complex Mannerisms, Response to Name, Eye Contact) did not reveal any significant discrepancies ($p > 0.05$).

Conclusions:

Preliminary findings suggest that parents may report fewer autistic symptoms on the M-CHAT-R than clinicians observe on the ADOS-2. Caregivers may be under-reporting certain symptoms, leading to fewer referrals and raising concerns about potential under-diagnosis in the broader population. Conversely, caregivers are considering a broader sample of behavior than the single ADOS-2 session. Results underscore the importance of combining caregiver and clinician impressions, as well as clinically interpreting specific parent reporting, in making a diagnosis. Future studies should explore the impact of caregiver psycho-education on autistic symptoms before screening to enhance the accuracy of assessing each child's developmental profile.

440.226 Kinematic Predictors of Handwriting Speed: A Comparative Study of Children and Adolescents with and without ASD

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Background: Handwriting, the mechanical process of producing written letters (Medwell & Wary, 2010), is reported as impaired in children and adolescents with Autism Spectrum Disorder (ASD), particularly concerning legibility and speed (Finnegan & Accardo, 2018). Digital handwriting assessment provides new opportunities to investigate its features, beyond traditional metrics.

Objectives: This study aims to enhance the understanding of handwriting features in individuals with ASD without intellectual disability, compared to non-diagnosed (ND) peers, specifically exploring kinematic predictors that could influence handwriting speed.

Methods: A total of 174 participants (ASD=58 [45M]; ND=116 [85M]), aged 8-16 years, were included. The groups were matched by age, FSIQ, and biological sex distribution. Participants completed a tablet-based handwriting task, requiring them to write a given sentence under two conditions: maximum accuracy and maximum speed. Total completion time (CT), and kinematic measures (distance covered, pressure on the surface, writing/total time ratio, and inclination angle of the pen tip) were recorded. Regression models were run.

Results: The association between CT, as the dependent variable, and handwriting kinematics was analyzed for both the accurate and fast conditions. In the first model, considering the accurate condition, the predictors accounted for 35% of the variance, $F(11,162)=9.46$, $p<.001$. A significant main effect for pen tip inclination angle [$\beta=-0.26$, $t=-2.16$, $p=.032$] emerged. Moreover, the interaction between group and distance covered [$\beta=0.40$, $t=3.25$, $p=.001$] indicated an association between lower CT and greater dimensions of the handwritten product for the ASD group. The interactive effect between group and surface pressure [$\beta=-0.93$, $t=-3.49$, $p<.001$], indicated that higher pressure was associated to higher CT, limited to the ASD group. In the second model, considering the fast condition, predictors accounted for 37% of the variance, $F[11,162]=10.13$, $p<.001$. A significant main effect of group [$\beta=1.31$, $t=2.22$, $p=.028$] emerged. An interaction between group and distance covered [$\beta=0.50$, $t=4.40$, $p<.001$] was observed, with the ASD group linking lower CT to larger handwritten dimensions. Lastly, an interaction effect between group and writing/total time ratio [$\beta=-0.97$, $t=-2.91$, $p=.004$] indicated that, limited to the ND group, lower CT was associated with a greater proportion of time spent writing. Such association has not been observed for the ASD group, resulting in a substantial independence between CT and writing/total time ratio.

Conclusions: Our findings on the association between distance covered and CT suggest that, in ASD, a larger writing pattern may be more functional in both the considered conditions. In the accurate condition, the association between heightened pressure on the surface and increased CT may reflect broader motor impairments, resulting in muscle tension. As concerns the fast condition, contrary to what has been observed for the ND group, the lack of an association between writing/total time ratio and CT might be attributed to either low processing speed or motor speed in the ASD group. Overall, our results underscore the importance of comprehensively addressing handwriting during assessments and intervention planning, given its critical role in academic success.

440.227 Lost in Translation? Assessing Quality and Readability of Autism Diagnostic Reports for Spanish-Speaking Families

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Background: Autism diagnostic reports often use complex and technical language that can be hard for caregivers to understand, especially for Spanish-speaking families with limited English proficiency (LEP). Cultural and linguistic barriers in Hispanic/Latiné communities can lead to under-diagnosis and delayed intervention, which is costly and increases health inequities. High-quality translations and readable reports can help families make informed decisions and access services, thereby improving outcomes for autistic children in under-resourced and minoritized communities.

Objectives: (1) Conduct a descriptive analysis of common words/phrases in autism diagnostic reports translated from English to Spanish received in the context of a research study (focusing on translation challenges). (2) Assess and compare readability of reports against the highest educational level reported by Spanish-speaking caregivers of toddlers receiving an autism diagnostic evaluation.

Methods: Reviewers analyzed 10 English-Spanish diagnostic report pairs to identify complex translations, ensuring a variety of cases, clinician authors, and translators. Phrases were reviewed by study team translators to compile common/complex examples (Table1). A readability analysis was performed on 20 diagnostic reports (10 previous and 10 additional, randomly selected), with both English and Spanish versions analyzed (40 analyses total). The Fry Readability Graph, validated for both languages, was used to determine and compare grade levels (education level required to read and understand a piece of text; see Table2). This method involved selecting three random 100-word passages from each report and calculating readability based on sentence and syllable counts.

Results: We generated a list of English words/phrases in diagnostic reports, emphasizing those that either have no Spanish equivalent, could be misconstrued through literal translation, or have nuanced meanings that may be challenging to translate (Table1). By evaluating strategies used to develop high-quality translations of autism diagnostic reports, we distilled key recommendations from our pragmatic process that translators can employ to improve quality and understanding. Strategies identified (used within a pragmatic Spanish Translations and Interpreter Training Program developed within our research center) help to promote accuracy, address cultural and linguistic barriers, and make translation procedures more efficient. English reports were, on average, less readable than Spanish reports (Table2), suggesting that translation practices incorporate methods that make written material more comprehensible for Spanish-speaking families. Sixty percent of Spanish reports (and twenty percent of English reports) were within the caregiver's highest level of education, emphasizing the need to provide additional support beyond the diagnostic report to ensure caregivers understand the results of their child's evaluation.

Conclusions: Translations that fail to consider the nuanced meaning of language in clinical reports can easily lead to misunderstanding and inappropriate or offensive language, all of which impede comprehension and exacerbate challenges experienced by Spanish-speaking families with LEP. Pragmatic translation training, autism education for translators, and promoting clinician-translator communication, can help enhance the quality of translations in clinical and research contexts, while improving cultural sensitivity and readability. Findings highlight the importance of providing support for caregivers to understand diagnostic reports beyond written communication, in addition to resource sharing, especially when serving socio-economically and linguistically diverse families of children receiving a first-time diagnosis.

**440.228** Maximizing Accurate Detection of Divergence from Normative Expectation in Behavioral Intervention Outcome Assessment

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Background: Current norm-referenced measures that assess behavioral intervention outcomes for autism spectrum disorder (ASD) often utilize outdated methods for comparing client scores to neurotypical reference populations. Continuous norming methods account for multiple demographic factors without significantly increasing the sample size, including standard linear, polynomial, and generalized additive models (GAMS). The Neurobehavioral Evaluation Tool (NET) was developed as a comprehensive assessment platform specifically designed for intervention outcome assessments. The third revision of the NET (NET V3.0) was developed to improve outcome assessment for ASD, including optimizing norming.

Objectives: The primary aim was to compare five continuous norming approaches to develop demographically-adjusted (age and sex) normative information and to accurately detect divergence from neurotypical expectation across a range of 12 neurobehavioral domains (55 subdomains) from the NET V3.0 informant-report survey scales.

Methods: NET V3.0 parent/caregiver informants were recruited through an online survey collection platform and provided data for one child or adult participant (N=918). NET V3.0 measures featured 6 symptom and 5 skill domains. Informants also provided demographic and clinical information. Clinical diagnoses were categorized into neurotypical, autism spectrum disorder (ASD), and other developmental disorders (DD). Five norming models were compared across all NET V3.0 measures: standard linear regression models (LM), quadratic polynomial models (QM), cubic polynomial models (CM), GAMS models, and GAMS models that added an interaction between age and sex (GAMSint). Analyses examined sample characterization and evaluated and compared norming methods, including bivariate correlations among demographically-adjusted scores, differences in extreme classifications, and divergence from the normative expectation.

Results: A majority of the 918 participants (Ages 2-80, 50.8% male) were reported to have no clinical diagnosis (NT n=536, 58.4%) and a minority reported a non-ASD DD (n=291, 31.7%) or ASD (n=91, 9.9%) diagnosis. Across most measures, but particularly for skills measures, GAMS models (GAMS or GAMSint) had optimal model fit. Consistent with this, in neurotypical individuals, most NET V3.0 measures showed complex non-linear age trends, including sex-specific non-linear patterns. Several low ICCs were observed between model scores across NET V3.0 measures and meaningful differences in extreme classifications were also observed across norming methods. For the CM, GAMS, and GAMSint, no statistically significant differences in proportion of scores that deviated from the normative expectation were identified, highlighting the importance of selecting models that capture complex non-linear trends.

Conclusions: The present results suggest that outcome measures, such as the NET V3.0 informant-report scales, would benefit from using GAMS models as norming methods. These models provide optimal fit to complex developmental trends and, when needed, can fit trends separately in males and females. Future research should examine and compare norming methods using both legacy and other new assessment instruments to accurately model the neurotypical score distribution and provide highly accurate demographically-adjusted scores. Accurate norming methods are crucial to clinical decision-making and an important feature in maximizing the value of interventions for ASD.



440.229 Measuring Changes in Social Communicative Behaviors of Verbal Adolescents and Adults

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Background: Verbal autistic adolescents and adults are often engaged in interventions which target social communicative behaviors necessary to developing and maintaining relationships and vocational placements. The field of ASD intervention research faces a number of significant limitations in its current practices of measuring intervention effectiveness. There is a critical need for the development of outcome measures that adequately and reliably detect changes in the social communicative behaviors of autistic individuals, especially in a short period of time. The Brief Observation of Social Communication Change (BOSCC) has been validated with minimally verbal children (called the BOSCC-MV), young verbally fluent children and individuals of any age who speak in phrases (called the BOSCC-PSYF) but has not yet been validated for use with verbal adolescents and adults.

Objectives: The aim of the present study is to determine the utility of the BOSCC-F1/F2 as an outcome measure of treatment response. The BOSCC-F1 is suitable for early adolescents up to age 11 and the BOSCC-F2 is suitable for adolescents and adults ages 11 and older. This study will analyze the factor structure, examine the initial psychometric properties, including inter-rater and test-retest reliability, and provide evidence of the BOSCCs utility as a measure of change by examining changes in scores over time in autistic individuals receiving behavioral interventions.

Methods: The present study applied the BOSCC-F1/F2 coding scheme to 290 video administrations over 115 participants diagnosed with ASD. The BOSCC-F1 was administered with 49 participants and the BOSCC-F2 was administered with 66 participants. Participants included individuals aged 8 years and older who speak in fluent, complex sentences. The factor structure was determined using exploratory structural equation modeling. Next, growth curve models were used to analyze changes over time in the full sample across domains totals. Test-retest and inter-rater reliability were also examined by assessing absolute agreement using two-way random effects models.

Results: Exploratory structural equation modeling revealed a three-factor structure comprised of the following domains: Early communication, social reciprocity/advanced language, and restricted and repetitive behavior (RRB). Inter-rater reliability was excellent for the early communication and social reciprocity/language domains (ICC = .865 and .866, respectively) and good for the RRB domain (ICC = .676). Test-retest reliability was excellent for the early communication and social reciprocity/language domains (ICC = .858 and .887, respectively) and fair for the RRB domain (ICC = .471). However, results indicated no statistically significant changes on any domains.

Conclusions: While the BOSCC has been validated as a standardized, flexible, and minimally biased assessment of social communication changes in response to treatment in younger and less verbal children, and although the BOSCC-F1/F2 is psychometrically sound, the BOSCC-F1/F2 did not pick up on change in response to 16-week behavioral interventions. More research is needed to elucidate what kinds and what amounts of change should be expected in verbally fluent adolescents and adults in response to behavioral interventions. More research is also needed to understand whether treatment modality (i.e., behavioral vs pharmaceutical) influences changes in social communication for autistic adolescents and adults.

440.230 Misdiagnosis or Missed Diagnosis? a Deep Neural Network Machine Learning Approach for Early Detection of Undiagnosed Autism Spectrum Disorder

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Background:

Diagnosis of children with autism spectrum disorder (ASD), when delayed or left undetected, has been found to lead to poor long-term functional outcomes and quality of life across development. Moreover, complex cases of ASD, such as children with dangerous behaviors or psychiatric comorbidities, may prevent detection within health care systems, leading to potential misdiagnosis. Children in public behavioral health systems across all 50 states receive the Child and Adolescent Needs and Strengths (CANS), a person-centered assessment that provides a unique opportunity for identifying potential signs of ASD. Because early diagnosis of ASD and early intervention is associated with better developmental outcomes, it is important to minimize the delay between initial indicators and diagnosis. Enhancing the capacity of public behavioral health systems to proactively recognize youth in care who may benefit from referral to diagnostic services through the CANS person-centered assessment and deep neural networks, has not yet been investigated.

Objectives:

To (1) validate a person-centered machine learning (ML) approach using a deep neural network model (DNN) to identify potential traits of undiagnosed ASD in public behavioral health systems, and to (2) to characterize the needs and strengths of youth at risk for developing ASD.

Methods:

Children ($N = 40,441$) aged 1-21 years-old served by a large state behavioral health system ($n=3,741$ with preexisting DSM-5 ASD diagnosis) were evaluated every 6-months with the Child Adolescent Needs and Strength Assessment (CANS) and asked their existing DSM-5 diagnoses between 2014-2023. 1,060 youth received at least one CANS prior to ASD diagnosis. For children whose penultimate CANS before diagnosis was less than 18 months prior to their diagnosis ($n=981$), a trained DNN ML model was conducted. Then the DNN model was validated on testing controls from the other half of undiagnosed CANS and upon testing cases which used only CANS from youth who entered care with an existing diagnosis ($n=2,681$), who were excluded from the training the DNN. After DNN model validation, calculating sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV), the model was applied to all CANS for non-diagnosis ASD youth to predict likelihood of undiagnosed ASD from 0 to 1.

Results:

A predicted probability greater than or equal to 0.75 was selected, such that the PPV for the final model was 0.33, or 1 in 3 of youth recommended for diagnostic referral ($n=4,331$; 11%) were predicted for diagnostic referral. CANS items such as developmental functioning, social functioning, emotional disturbance, emotional regulation, self-harm, intentional misbehavior, oppositional behavior were elevated in both predicted and diagnosed children (Figure 1).

Conclusions:

Results yielded a high PPV for undiagnosed ASD diagnosis in youth in public behavioral health care settings using a CANS-based person-centered ML approach. We showed a sliding scale of predicted probabilities of undiagnosed ASD using routine assessment information to recognize early referral opportunities, with a sliding probability cutoff that can be adjusted to suit pragmatic decision support needs. Routine person-centered assessment information shows the potential to recognize early referral opportunities and improve long-term developmental outcomes.



440.231 Oral Microbiota Profiling for Diagnosis and Therapeutics of Autism Spectrum Disorder

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Background: Autism Spectrum Disorder (ASD) is a complex neurodevelopmental condition characterised by deficits in social communication, restricted interests, and repetitive behaviours. Despite the increasing global prevalence of ASD, its underlying mechanisms remain poorly understood, and no definitive biological markers have been identified. Diagnosis primarily relies on behavioural assessments, often leading to delayed intervention. While extensive research has been conducted on the gut microbiota's role in ASD, there is a significant lack of microbiota data, particularly within the Indian population.

Objectives: This study aims to explore the potential contribution of oral microbiota to ASD through its impact on the gut-brain axis, a growing area of interest in ASD research. By profiling microbial differences in oral samples from individuals with ASD and neurotypical controls, the study seeks to identify microbial signatures that could serve as early, non-invasive diagnostic markers.

Methods:

A systematic literature review was conducted following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, identifying key bacterial species potentially associated with ASD. These species were evaluated and ranked based on their relevance, data quality, and prevalence across studies. To further validate these findings, saliva samples from ASD individuals and neurotypical controls ($n=30$) are being collected. These samples will also support future gene expression studies, aiming to confirm observed microbial differences in line with the literature.

Results:

Analysis revealed 20 bacterial species significantly more abundant in individuals diagnosed with ASD. The most prominent genera included *Clostridium*, *Bacteroides fragilis*, and *Prevotella*, underscoring the diversity of microbial communities associated with ASD. The findings reinforce the hypothesis that these species may influence neurodevelopment through the gut-brain axis. Of particular interest is the role of microbial metabolites in triggering neuroinflammatory responses and behavioral changes, offering new insights into ASD pathophysiology.

Conclusions:

This study establishes a potential link between oral microbiota and ASD, providing a foundation for developing microbiota-based diagnostic tools. Such tools could enable early, non-invasive detection of ASD, especially in regions with limited microbiota data, like India.

440.232 Parental Experiences of Different Preschool Autism Spectrum Disorder Diagnostic Assessments between 2017 and 2022 from a Single Center

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Background: Early intervention is regarded as important for optimal outcomes, making timely assessments essential. However, increasing demand for assessments, with referral rates increasing year on year, is leading to unacceptably long wait times in many countries. The Autism Spectrum Disorder (ASD) assessment process itself can substantially influence a family's well-being, with common concerns including uncertainty around processes, wait times, delay in intervention and assessment reliability. Children presenting early, that is less than 36 months of age, can have a clearer diagnostic presentation than those presenting at school age or later. Therefore, a pilot to evaluate whether a single assessment by a single clinician could identify children with or without ASD, and the percentage of children where additional assessments were required to reach a diagnosis was run April 1, 2021 to August 31, 2022. Two hundred and twenty three children were involved in the pilot and data will be shared to provide context to this study. The pilot study was acceptable to the clinicians involved, did not lead to a high frequency of reassessments, and resulted in considerably shorter wait times for families. However, with only informal feedback from families, there was a need for more extensive and comprehensive evaluation from a parental perspective.

Objectives: The aim of this study was to explore parental experiences of the shorter, more timely diagnostic assessment of their preschool child as compared to alternative diagnostic assessments over the previous five years with the objective of informing future assessment processes.

Methods: A retrospective online survey of parents whose preschool aged children underwent an ASD diagnostic assessment between 2017 and 2022 at a single center was conducted. Basic demographics, information about ASD assessment experiences and priorities, and what did and did not work well was collected by a series of Likert scale, forced choice and open-ended questions. Data analysis used descriptive statistics, qualitative analysis of open-ended responses, and triangulation of results to further interpret and understand findings.

Results: Email contact details were available for 327 potential participants and 62 (19%) consented to complete the survey and provided some responses with 36 (11%) completing the whole survey. While overall satisfaction rates were high, there was a wide range of experiences shared and often dichotomous priorities. Nevertheless, a consistent theme for any assessment process to be successful was the need for clear communication before, during and after the diagnostic appointment(s).

Conclusions: Simplifying the assessment process for the youngest children referred reduced wait times without reducing diagnostic clarity or parental satisfaction and confidence. The need for clear communication throughout was a consistent theme and an achievable aim.

440.233 Partnering with Community Providers; Using Information from Primary Care Providers to Best Fit Autism Evaluations Using an Abbreviated Telehealth Assessment Model

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Background: The rising rates of autism have long exceeded subspecialist capacity for diagnostic services, resulting in the rise of several education and training initiatives to support primary care providers (PCPs) in improved identification and management of autistic youth (Keehn et al., Roberts et al., 2023). The Pediatric Care Network (PCN) is one such initiative, where PCPs are trained to conduct an autism-focused developmental interview (AFDI) that accompanies their referral for subspecialist evaluation. Though over 400 patients have been seen through the PCN pathway, and preliminary survey results indicate improved knowledge, satisfaction and confidence (Coan, et al., 2023) from PCP participants, the PCN clinical team wanted to explore whether the PCP's AFDI might inform a more efficient and "right fit" assessment process. With rising confidence in the use of telehealth for diagnostic assessment (Alfurayden et al., 2020, Liu et al., 2022), PCN subspecialists conducted record reviews to identify patients suspected to be a good fit for an abbreviated telehealth assessment (ATA; 3-4 hours) rather than a standard in-person assessment (6-8 hours). The current study sought to better understand characteristics of patients who can be successfully diagnosed using the ATA model in hopes of creating a more formalized triage process for patients moving forward.

Objectives:

1. Characterize the patients and families referred to the ATA.
2. Identify characteristics of children who completed the evaluation via the ATA model versus those who required additional in-person testing to complete the evaluation.

Methods: Subspecialty clinicians conducted chart-reviews of the PCP's AFDI, and selected patients for expedited access to an ATA. We then analyzed demographic information, diagnostic results and successful completion of the evaluation in the ATA model. Chi-square analyses and independent sample t-tests were run to determine differences across children who successfully completed ATA versus not.

Results: 44 (66% male, 34% female) patients were triaged into ATA slots over a two-year period. Average age seen was 5.4 years (range 1-16). 57% of patients triaged to the ATA pathway successfully completed their evaluation (average time spent 3.36 hours). All patients who completed their evaluation on telehealth received an autism diagnosis. Those who required in-person testing received an autism diagnosis 74% of the time (average time spent 6.79 hours). Chi-square analyses indicated a statistically significant association between successful completion of the ATA and the following variables: a resulting diagnosis of autism, previous identification of autism through school or community provider, and having an immediate family member with an autism diagnosis. Further, Independent sample t-test revealed significant difference between groups regarding age, such that children who successfully completed the ATA were significantly younger (Mage= 4.2 years) compared to those requiring in-person testing (Mage=6.95 years).

Conclusions: The current study suggests that information gathered from trained PCPs may be useful in right-fitting evaluations to improve efficiency. Promising indicators that may inform successful triage to an ATA include a previous autism diagnosis from school or community, an immediate family member with autism, and younger patient age. Future projects will incorporate these findings into a more formalized triage process for patients awaiting evaluation.

440.234 Predicting ADOS-2 Autism Severity Levels By Machine Learning Models

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Background:

The Calibrated Severity Scores [CSS; also known as Comparison Score (CS)] in the Autism Diagnostic Observation Schedule, Second Edition (ADOS-2), provide a standardized measure of autism symptom severity and allow for comparison across different age groups and language abilities. However, in large-scale autism cohorts, it is often not feasible to collect in-person ADOS-2 assessments, as compared to common parent-reported surveys, such as the Social Communication Questionnaire (SCQ).

Objectives:

This study aims to predict autism severity as measured by the ADOS-2 CSS using machine learning models and leveraging data from SPARK (Simons Powering Autism Research for Knowledge), a large-scale autism cohort with comprehensive behavioral and medical data.

Methods:

The data for this study were drawn from version 10 of the SPARK phenotype database, updated in July 2023, which contains phenotypic information for 328,973 autistic individuals and their family members, of whom 1,178 individuals aged 1 to 18 years with complete ADOS-2 CSS data were retained for analysis. Four modules of the ADOS were included: Toddler, 1, 2 and 3, which correspond to age and language level, respectively. Autism severity is classified based on ADOS-2 CSS, with CSS 1-5 categorized as little-to-moderate and CSS 6-10 as moderate-to-severe. 276 predictor variables from demographic, medical history, and behavior surveys [SCQ, Repetitive Behavior Scale-Revised (RBS-R) and Developmental Coordination Disorder Questionnaire (DCDQ)] were pre-processed by creating dummy variables, normalizing them to a mean of 0 and a standard deviation of 1, and removing near-zero-variance predictors. The complete dataset was then split into training (70%), validation (15%), and test (15%) sets using stratified sampling. To address class imbalance, the ROSE (Random Over-Sampling Examples) technique was applied to balance the two classes to a 1:1 ratio. Logistic regression was used to evaluate relationships between key variables and autism severity. Several machine learning models were applied, including Linear Discriminant Analysis (LDA), Elastic Net Regression, Support Vector Machine (SVM), and K-Nearest Neighbors (KNN). Model performance was assessed using metrics such as area under curve (AUC), balanced accuracy, and kappa.

Results:

Logistic regression results showed a borderline significant association between ADOS-2 module level (Toddler, 1, 2 or 3) and ADOS-2 CSS, with a p-value slightly greater than 0.05 (Table 1). Among the machine learning models evaluated, Elastic Net Regression and SVM exhibited the strongest predictive performance for ADOS-2 severity levels with AUC values of 0.756 and 0.767 respectively on the validation set (Figure 1). Elastic Net Regression achieved a balanced accuracy of 0.686, indicating moderate classification performance across the ADOS-2 severity spectrum, while SVM demonstrated comparable performance with a balanced accuracy of 0.627. In contrast, KNN and LDA demonstrated suboptimal performance, showing lower AUC and accuracy scores on both the validation and test sets.

Conclusions:

Our findings suggest that ADOS-2 severity levels can be successfully predicted from commonly used parent questionnaires. Elastic Net Regression and SVM are the most effective models for prediction. ADOS module level and relatedly language level, may have some impact on autism severity.



440.235 Professionals' Experiences of Using the Autism Clinical Interview for Adults (ACIA) in Diagnostic Practice

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Background:

Identification of autism in adults continues to be an important priority. We developed a new diagnostic interview for use in the assessment of adults with possible autism: the Autism Clinical Interview for Adults (ACIA). The ACIA includes a pre-interview questionnaire (PIQ) and both subject (ACIA-S) and informant (ACIA-I) interview versions. The acceptability for adults attending assessments, and initial utility of the ACIA have been reported. ACIA training for professionals commenced in 2021 and over 1000 people have been trained.

Objectives:

This study aimed to investigate the views of practitioners trained in the ACIA, about (i) their use of ACIA since training, and (ii) the clinical utility of the interview.

Methods:

A bespoke questionnaire was developed, with closed and open-text questions, to explore participants' experiences of the ACIA (training, utility, and implementation). 1092 practitioners were contacted by email. Descriptive statistics and chi-square tests were used to examine quantitative data, and thematic analysis for open text responses.

Results:

330/1092 (30.2%) practitioners responded. 48% of respondents' main employment was in a publicly funded service (e.g., the UK National Health Service); 52% of respondents were employed in privately provided services. The PIQ was used less frequently than expected (47%). 70% of responders had used the ACIA (90% the subject version; 69% the informant version). Responders had completed a mean of nine assessments and had diagnosed a mean of four autistic people using the ACIA. 167 (61%) had formally or informally incorporated the ACIA into their diagnostic service. The ACIA was considered useful for identifying autism spectrum characteristics (99%), and co-occurring conditions (73%); providing information to feedback following assessment (92%); and providing information for writing reports (89%). Most participants (89%) thought people having the autism assessment found the ACIA acceptable and useful. Both publicly funded and private providers found the ACIA training useful. Following training, practitioners in private diagnostic services reported significantly more improvement in skills ($p < 0.001$) and confidence ($p < 0.001$) in assessing possible autism in adults, and being better equipped to support adults under their care ($p < 0.001$) compared to practitioners from publicly funded diagnostic services. 119 (36%) responders will participate in future research to investigate the ACIA psychometric properties. Thematic analysis revealed four themes: 1) Natural flow, "very thorough and comprehensive assessment that has a good natural flow through it"; 2) Rich information, "by the end of the assessment I feel confident that I know the person well"; 3) Affirming for the person being assessed, "allows clients to understand their characteristics of autism and validate them"; and 4) Improved practitioner confidence, "I have improved confidence of interpreting the information and allowing a conversation to occur".

Conclusions:

Evaluation of ACIA use and utility shows most responders use the ACIA, and that the interview facilitates the assessment of autism in adulthood. In the future we will evaluate the psychometric properties of the ACIA interviews, including the range of ACIA scores associated with a clinical autism diagnosis.

440.236 Profiles of Verbal Pre-School Children Completing Autism Tele-Assessment Using the TAP-P

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Background: Though early identification of autism is a consistent priority for the field, wait lists for evaluation often increase as children enter pre-school. Telemedicine is increasingly used as an alternate path for autism diagnostic evaluation, with research documenting strong acceptability, family satisfaction, and diagnostic concordance with in-person assessment for the toddler age group. However, few tools to date have been designed and studied specifically for use with preschoolers, who may present with a wide range of verbal and social communication skills. The present data are drawn from a study of the TELE-ASD-PEDS-Preschool (TAP-P), a tele-assessment tool designed for use with children between 36-72 months of age. The TAP-P uses distinct administration and scoring procedures depending on a child's language level (TAP-P Verbal, TAP-P Nonverbal).

Objectives: To examine profiles of children assessed using the TAP-P Verbal version, including tele- and in-person assessment scores, as well as clinician diagnostic certainty and concordance with in-person assessment.

Methods: Sixty-two children participating in this study completed the TAP-P Verbal version (72% male, 26% female; mean age = 51.1 months, $SD = 9.8$, range = 36-71 months). All children received two evaluations during their study participation: an initial visit conducted via telehealth and a second visit completed in-person, by a clinician unaware of tele-assessment outcomes. The telehealth evaluation involved administration of the TAP-P, a clinical interview, and the Developmental Profile 4. The in-person assessment included administration of the Differential Ability Scales-II, Vineland-3, and Autism Diagnostic Observation Schedule, Second Edition. Clinicians documented diagnostic impressions after each appointment.

Results: Following tele-assessment, clinicians indicated the presence of autism for 32% of participants, the absence of autism for 16%, and indicated "unsure" in 52% of cases. Diagnostic concordance with in-person assessment was 90% for cases in which tele-assessment clinicians documented presence or absence of autism ($n=3$ participants identified as "autism absent" on tele-assessment were diagnosed with autism following in-person assessment). Table 1 displays mean scores for tele- and in-person assessments for each group. Tele-assessment clinicians were also asked to identify interview questions that enhanced diagnostic certainty. Within 36 independent responses, the most frequently referenced themes were: rigidity related to routines ($n=13$), sensory differences ($n=11$), peer relationships ($n=10$), early development ($n=7$), play ($n=6$), and general social skills ($n=6$).

Conclusions: This work documents initial use of the TAP-P within a sample of preschool-aged children, demonstrating that a subset of children can be reliably and confidently identified as having autism using these procedures. Clinicians reported less certainty about diagnostic decision-making via telehealth for children with fewer clear autism-related behaviors, but highlighted specific areas in which caregiver information was particularly helpful. Future work will continue to hone and refine tele-assessment procedures, with the dual goals of (1) optimizing both clinical observations and information requested via caregiver report to enhance diagnostic ascertainment and (2) identifying profiles of children and families that can assist with triaging families toward tele-assessment vs. in-person assessment for initial evaluations.



440.237 Psychometric Characteristics of the Aaspire Autistic Burnout Scale-Revised

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Background: While the autistic community has long emphasized the importance of autistic burnout, research on the topic remains scant. Psychometrically sound instruments are needed to diagnose autistic burnout and assess the effectiveness of interventions to prevent or treat it. Previous studies have shown promising preliminary results for the psychometric properties of the original 27-item AASPIRE Autistic Burnout Scale (Mantzas 2024). However, such studies included limited populations. Community members also raised concerns about the scale's accessibility and length.

Objectives: To use a community-based participatory research approach to:

- Revise the original AASPIRE Autistic Burnout Scale (AABS-27).
- To evaluate the reliability and validity of the AABS-revised (AABS-R14) in a diverse sample of autistic adults.

Methods: We collaboratively revised the AABS-27 to increase accessibility, reduce the number of items, and create separate self-report and caregiver-report (CR) versions. We then conducted cognitive interviews with 37 autistic adults and caregivers to assess content validity and iteratively made additional small refinements based on feedback. We used the AABS-R14 in a longitudinal study of autistic adults recruited from healthcare systems, disability services, and the community. This analysis includes baseline data from 865 participants, 600 who participated directly independently (DR), 199 with support (DR-S), and 66 via caregiver report (CR). To assess structural validity, we randomly split the sample into two halves and conducted independent exploratory (EFA) and confirmatory factor analyses (CFA). We used Cronbach's α to measure internal consistency; a priori hypothesis testing to assess construct validity (looking for expected correlations between the AABS-R14 and other wellbeing indicators); and Receiver Operating Characteristic (ROC) analysis to assess criterion validity (as compared to participants' own assessment as to whether they were currently experiencing autistic burnout.) Primary analyses used the full sample. Secondary analyses excluded participants who participated via caregiver report.

Results: EFA confirmed that the 14 items load onto a single Autistic Burnout factor, with high factor loadings (>0.60) and significant Bartlett's tests ($p < 0.001$). The KMO measure (≥ 0.899) indicated excellent sampling adequacy. CFA showed adequate fit for the DR and DR-support subsamples (RMSEA = 0.10; CFI = 0.93; SRMR = 0.04–0.05), but inadequate fit for the CR sample, likely due to its modest sample size (valid $N = 63$). Cronbach's α was 0.95. As predicted, Autistic burnout was significantly correlated with depression ($r = 0.64$), flourishing ($r = -0.47$), quality of life ($r = -0.45$), overall health ($r = -0.56$), and other well-being indicators (all p -values < 0.001 , Bonferroni-adjusted). ROC analysis showed an accuracy rate of 87.4%. Secondary analyses excluding caregiver reported data did not substantially alter findings.

Conclusions: The direct-report version of the AABS-R14 appears to have strong psychometric properties in a diverse sample of autistic adults recruited from a variety of settings in the US. Additional planned analyses will assess its test-retest reliability and responsiveness to change, as well as factors predicting the development of autistic burnout. Future research is needed to further validate the caregiver report version of the instrument, and assess the effectiveness of interventions to prevent or treat autistic burnout.

**440.239 Psychometric Properties of the Autism Diagnostic Interview-Revised (ADI-R) in Mainland of China**

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Background: The Autism Diagnostic Interview-Revised (ADI-R) is a parent-proxy instrument widely used to assist autism diagnosis for individuals 18 months and above (Lord et al., 1994). The ADI-R has been adapted to different language versions, including Chinese which was approved by the Western Psychological Services (WPS) in 2007 (Huang et al., 2022). However, little is known about the psychometric properties of the ADI-R Chinese version administered in a Chinese mainland population. Participants of this study are drawn from a large clinical sample from a nationally recognized developmental-behavioural centre for neurodevelopmental disorders in southern China.

Objectives: The objective of this study is to evaluate the psychometric properties of the ADI-R in mainland of China, specifically looking at internal consistency reliability, diagnostic validity, and convergent validity.

Methods: This study is part of a large retrospective record review of individuals who visited the centre's outpatient's clinic between January of 2018 to August of 2021. Participants (N=2666, 84% males & 16% females) used in this study were clinically diagnosed with a neurodevelopmental disorder, including autism. Participants were divided into two groups, the autism group and non-autism group, containing 2224 and 442 individuals respectively. IBM SPSS software was used for data analysis. Cronbach's α coefficient was calculated to evaluate internal consistency reliability for each domain of the ADI-R. Sensitivity and specificity tests, as well as area under the receiver operating characteristic (ROC) curves were calculated to investigate diagnostic validity. Autism diagnosis suggested by the ADI-R thresholds was compared to clinician's diagnosis to assess convergent validity.

Results: Preliminary results suggest good internal consistency reliability and diagnostic validity of the ADI-R administered in a Chinese mainland population. Cronbach's α coefficients were 0.852 for the Reciprocal Social Interaction domain (A), 0.761 for the Nonverbal Communication domain (BNV), 0.715 for the Verbal Communication domain (BV), and 0.392 for the Restricted, Repetitive, and Stereotyped Patterns or Behavior domain (C). The area under the ROC curve was 0.768 (0.743-0.793) for domain A, 0.773 (0.728-0.818) for domain BNV, 0.776 (0.748-0.803) for domain BV, and 0.759 (0.733-0.785) for domain C. The positive predictive value (PPV=0.931) was calculated to compare diagnosis suggested by the ADI-R to clinician's diagnosis of autism.

Conclusions: This study gives insight into the administration of the ADI-R in a large clinical sample in mainland of China in supporting the diagnosis of autism. The ADI-R Chinese version has demonstrated good reliability and validity. Further research is suggested on looking more into the administration of the ADI-R with typically developing individuals and comparing the ADI-R to other diagnostic measures.

440.240 Psychometric Properties of the Chinese Version of World Health Organization's Quality of Life Instrument -Disability Version (WHOQOL-DIS) and Autism Spectrum Quality of Life (ASQoL) in Taiwan: A Preliminary Analysis

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Background: Quality of life (QoL) has received increasing attention in recent years, recognized as a complex and multifaceted concept. With the development of the rights and advocacy movement for people with disabilities, alongside a neurodiversity perspective on neurodevelopmental disorders, it is necessary to explore individuals' subjective QoL. Previous studies have employed various tools to assess the QoL of people with disabilities. The World Health Organization's Quality of Life Instrument -Brief Version (WHOQOL-BREF) is one of the most widely used QoL questionnaire in Taiwan. Considering the specific characteristics of individuals with Autism Spectrum Disorder (ASD), using the World Health Organization's Quality of Life Instrument -Disability Version (WHOQOL-DIS) and Autism Spectrum Quality of Life (ASQoL) could provide a more comprehensive understanding of the different aspects and experiences of QoL in this population.

Objectives: The objective of this study is to establish the reliability and validity of the Chinese versions of the WHOQOL-DIS and ASQoL, including the analysis of internal consistency reliability, test-retest reliability, construct validity, and criterion-related validity.

Methods: After completing the forward and backward translation and cultural adaptation of the WHOQOL-DIS and ASQoL, three adults with ASD were invited to provide qualitative feedback on the translation of the items, which were then revised into the final versions of the questionnaires. Participants were individuals with ASD aged 18 and older in Taiwan, who either had official disability certification or a clinical diagnosis. The participants completed the WHOQOL-DIS, ASQoL, Autism Spectrum Quotient (AQ), Short Form-36 Health Survey (SF-36), Satisfaction with Life Scale (SWLS), and Perceived Stress Scale (PSS) primarily through online questionnaires, with paper-based questionnaires available as needed. A follow-up retest of the QoL questionnaires was conducted one month later.

Results: A total of 132 participants were recruited, with an average age of 26.47 years. The internal consistency reliability of the WHOQOL-DIS and ASQoL was 0.85 and 0.75, respectively. The test-retest reliability sample size was 93, with test-retest reliability coefficients of 0.78 and 0.85 for the WHOQOL-DIS and ASQoL, respectively. Based on previous research, the WHOQOL-DIS was expected to consist of three factors:

Discrimination (3 items), Autonomy (3 items), and Inclusion (6 items). The results of confirmatory factor analysis (CFA) indicated a poor model fit (CFI = 0.854, RMSEA = 0.117), though consistent with prior studies. Examining the standardized factor loadings revealed that the loadings for the Advocacy item in the Discrimination dimension were particularly low, which may be attributed to cultural and linguistic differences in the use of the concepts of advocacy and support. Correlation analysis showed that the WHOQOL-DIS and ASQoL were moderately correlated with the SF-36 subscales (vitality, social functioning, mental health), as well as with the SWLS and PSS.

Conclusions: The WHOQOL-DIS and ASQoL demonstrated acceptable internal consistency reliability, test-retest reliability, and criterion-related validity. Regarding construct validity, the results did not meet expectations. In the future, while expanding the sample size, the cultural appropriateness of the item constructs also need to be explored.

440.241 Eye-Tracking Measures As Markers of Treatment Response in Autism Intervention: A Meta-Analysis

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Background: There is growing consensus on the relation between eye-tracking measures of gaze behaviors and core autism characteristics. Specifically, recent meta-analyses support a concurrent relation between eye-tracking measures and clinical assessments of social behaviors in autistic individuals (Riddiford et al., 2022; Yoon et al., 2024). The current meta-analysis builds upon that foundation by exploring the efficacy of eye-tracking measures in a longitudinal context, particularly concerning autism interventions.

Objectives: The study has two aims: to (a) estimate the effect size of changes in eye-tracking measures from pre- to post-treatment; and (b) evaluate the moderating influence of the type of treatment received on these changes.

Methods: Following the PRISMA guidelines (Page et al., 2021), we identified 17 articles. For the first aim, we conducted a multivariate random-effects meta-analysis with a multilevel structure to account for clustering within studies. We performed a sensitivity analysis under three assumptions (ρ [r] = .3, .6, and .9) to assess the robustness of the results. Small-study effects were examined using standard error as a predictor in the model and visual inspection of the funnel plot. For the second aim, we conducted meta-regression, excluding the influence of small-study effects.

Results: A total of 143 effect sizes were included in the analyses, covering 551 autistic participants (M_{age} = 3-28 years). The sensitivity analysis for the first aim revealed relatively stable small-to-moderate significant effect sizes across different assumptions (r = .3, Hedge's g = .339, 95% CI [.042, .636], p = .025; r = .6, Hedge's g = .319, 95% CI [.031, .608], p = .030; and r = .9, Hedge's g = .286, 95% CI [.004, .569], p = .047). Based on this stability, we proceeded with a single ρ value (r = .6) for subsequent analyses. The assessment of small-study effects identified several influential effect sizes (k = 6). See attached Figure 1 for funnel plots. After adjusting for influential effect sizes, the overall effect size increased but remained in the small-to-moderate range (Hedge's g = .394, 95% CI [.084, .705], p = .013), suggesting that outliers had dampened the original estimate while validating the overall effect size. Heterogeneity among the included effect sizes was observed (Q = 531.888, p < .001, I^2 = 74.4%). For the second aim, the analysis revealed that the treatment type significantly moderated the overall effect size (Q_m = 8.722, p = .013). Notably, both biomedical (b = .213, 95% CI [.039, .387], p = .017) and technology-based treatments (b = .479, 95% CI [.089, .870], p = .016) showed stronger effect relative to behavioral treatments.

Conclusions: While overall effect sizes were modest, findings indicate that eye-tracking measures exhibit noticeable change across treatment periods. Results also suggest that biomedical or technology-based interventions may be particularly amenable to monitoring through changes in gaze behaviors. This work thus supports the potential for eye tracking as a tool for treatment monitoring.



440.242 Racial Bias in the ADOS: Comparison of Differential Item Functioning and Moderated Nonlinear Factor Analysis Among More Than 4,000 Participants from NDAR and Ssc

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Background:

The Autism Diagnostic Observation Schedule (ADOS) is one of the most highly regarded autism evaluations. Unfortunately, multiple studies have demonstrated significant differential item functioning (DIF) for individuals from different racial groups, and the mechanism for racial bias in the ADOS remains unknown because DIF effects are inconsistently replicated across items. Although the ADOS consists of 5 modules and 2 historical versions (ADOS and ADOS-2), studies searching for bias using item response theory-based DIF analyses often compromise statistical power to account for these differences by subdividing their samples. A moderated nonlinear factor analysis (MNLFA) is more appropriate because it allows for the presence of multiple moderators, where there may be multiple sources of bias, and it allows the specification of bias receptors (e.g., item-level, factor-level). To date, six studies have used MNLFA to assess differential item functioning in the ADOS for age or sex. No study has used MNLFA to examine racial bias, nor has it been used to examine differences across the different modules and versions of the ADOS.

Objectives:

To test for differential functioning in the ADOS items across race (African-American, Asian, White), module (1-4), and version (ADOS and ADOS-2).

Methods:

The current study is the largest examination of DIF in the ADOS to date (N = 4354+), utilizing data from the Simons Simplex Collection (n = 2851) and the NIMH Data Archive (n = 1503). Data collection is complete for Module 3 and forthcoming for Modules 1, 2, and 4 (due to a recent shutdown of the NIMH Data Archive). First, item response theory-based DIF was conducted on the 14 algorithm items using the lordif package in R. A graded response model was selected given the ordinal response data. Chi-square significance tests were used to detect significant uniform and non-uniform DIF, with an alpha cutoff value of 0.05. DIF analysis will be further conducted with data from all modules and versions aggregated. Second, measurement invariance will be tested via MNLFA, using the OpenMx package in R. A confirmatory one-factor model, specified with the 14 algorithm ADOS items as manifest variables and with race, version, and module as moderating effects for the factor loadings and item intercepts in Figure 1, will be used.

Results:

Within Module 3 aggregated across versions 1 and 2, four algorithm items showed significant DIF: B1 "Eye Contact" ($\text{Pr}(\chi^2_{12})=0.117$, $\text{Pr}(\chi^2_{23})=0.001$), B4 "Shared Enjoyment" ($\text{Pr}(\chi^2_{12})=0.709$, $\text{Pr}(\chi^2_{23})=0.004$), B11 "Quality Rapport" ($\text{Pr}(\chi^2_{12})=0.001$, $\text{Pr}(\chi^2_{23})=0.267$), and D2 "Complex Mannerisms" ($\text{Pr}(\chi^2_{12})=0.021$, $\text{Pr}(\chi^2_{23})=0.675$). The item characteristic curves of B11 and D2 suggest uniform DIF, whereas DIF in B1 and B4 is non-uniform (Figure 2).

Conclusions:

In the largest sample to date, we have identified bias in four ADOS Module 3 algorithm items. We will conduct a larger analysis with MNLFA to determine whether the source of racial bias is due to specific modules or versions of the ADOS. This analysis will allow us to pinpoint specific module items and offer solutions to improve the measure and thereby diagnostic accuracy and equity for diverse individuals.



440.243 Racial Differences in Self-Reported Autism Traits

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Background: Self-reports are often used in adult autism research as they are practical, efficient, and cost-effective (Sandercock et al., 2020). The most commonly-used are the Autism-Spectrum Quotient (AQ) and Social Responsiveness Scale (SRS-2) (Stewart & Austin, 2009). While self-reports provide valuable insights from the autism community, responses may be biased by personal characteristics (e.g., sociocultural factors). For example, Malaysian and Indian adults scored significantly higher than UK adults on the AQ (Freeth et al., 2013). Taiwanese and German participants scored similarly on the SRS-2, but lower than American participants (Wang et al., 2012). Research is needed in more diverse samples and with consideration of racial differences in sensitivity and specificity of such measures.

Objectives: We investigated the impact of race on AQ-28 (Hoekstra et al., 2011) and SRS-2 (Constantino, 2012) scores. Within our sample who resided in the US and were fluent English speakers, we hypothesized that minority populations would score higher on both.

Methods: Participants were part of two NIH funded studies that aim to pinpoint specific neural circuits that are affected in autism. Participants included non-autistic (n=210; 63% female gender, 2% other gender) and autistic (n=87; 42% female gender, 8% other gender) adults aged 18 to 30 years old ($M=23.68$ years, $SD=3.36$) with an $IQ>70$. The sample was primarily White (60%), with 20% identifying as Asian, 8% Biracial/Multiracial, 2% Black, and 3% other. Diagnostic groups were evaluated separately due to differences in racial/ethnic composition. While autism diagnoses were confirmed using recommended measures (ADOS-2, CARS, BOSA, DSM-5 checklist), current analyses focused on participants' self-reports of autism traits on the AQ-28 and the SRS-2. The effect of race on AQ and SRS scores was evaluated with one-way ANOVAs, run separately for each diagnostic group. Post-hoc comparisons were performed using Tukey's test to examine differences between the racial groups. For sensitivity/specificity analyses, two cut points were evaluated for the AQ-28: 65 (Hoekstra et al., 2011) and 70 (deVries et al., 2023). For the SRS-2 a T-score <60 indicates "Within Normal Limits" was therefore used as the cut point (Constantino & Gruber, 2012).

Results: There was not a main effect of race for the autistic ($F(3,62)=0.15, p=.861$) or non-autistic participants ($F(5,172)=2.11, p=.067$) on AQ scores. As results approached significance for the non-autistic group, a post-hoc Tukey's test indicated Asian participants scored higher than White participants (mean difference=4.80, $p=.053$). Similarly, there was not a main effect of race on the SRS-2 for the autistic ($F(3,52)=1.27, p=.295$) or non-autistic participants ($F(4,106)=0.54, p=.707$). Results are presented in Figure 1. As exhibited in Table 1, the sensitivity was higher when the AQ cut-off was 65, but specificity was lower. This trend was true for all races.

Conclusions: Although there were no major differences between races and sensitivity and specificity were fairly similar, there may be residual differences in AQ scores between non-autistic White and Asian participants. Future qualitative research should aim to understand how personal experiences and culture may affect self-endorsement of autism traits.

**440.244** Rasch Analysis of the Modified Checklist for Autism in Toddlers, Revised with Follow-up (M-CHAT-R/F)

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Background: The Modified Checklist for Autism in Toddlers, Revised with Follow-up (M-CHAT-R/F) is a 20-item scale designed to facilitate early identification of autism in low-risk populations. Despite its widespread use across various cultures, its psychometric integrity has not been comprehensively investigated, particularly in community samples.

Objectives: This study examined the measurement properties of the M-CHAT-R/F using Rasch Analysis.

Methods: Rasch analysis was undertaken on M-CHAT-R/F data collected from a community sample of 1355 Minnesotan children (670 girls, 685 boys) with an average age of 21.4 (SD: 2.5) months (range: 17-42) using the WINSTEPS software. Analyses were performed on the full 20 items to evaluate overall model fit, suitability of response options, unidimensionality, targeting, and item fit.

Results: Several properties of the scale were deemed satisfactory. The response options performed adequately well, and the scale met the criterion of unidimensionality. The item separation index (10.7) and reliability (0.9) were observed to be very high, suggesting that items could precisely discriminate ten levels of difficulty. However, person separation (0.1) and reliability (0.01) were very low, and the scale demonstrated poor targeting, indicating a mismatch between item difficulty and respondent's abilities. Out of the twenty items, five were also identified as misfits.

Conclusions: The Rasch model showed that the 20-item M-CHAT-R/F could be reduced to a 15-item instrument as this will potentially make the scale more efficient in measuring autistic traits in community dwelling infants or toddlers. Further, the present findings highlight that the inclusion of 5 misfit items in the current measure may have unintended practical consequences (e.g., misidentification). Although the M-CHAT-R/F showed promise in discriminating between ability levels, the poor targeting demonstrated that it may not be effective or particularly granular in a general population or community sample.

440.245 Reliability of the Intolerance of Uncertainty Scale for Children (IUS-C) for Use with Autistic Adolescents

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Background: Intolerance of uncertainty (IU) is a dispositional tendency to find ambiguous situations overwhelming. 39.6% of autistic youth are diagnosed with at least one anxiety disorder (van Steensel et al., 2011). Both autistic and non-autistic youth who experience IU are at heightened risk for anxiety (Jenkinson et al., 2020; Osmanağaoğlu et al., 2018). The Intolerance of Uncertainty Scale for Children (IUS-C) is a commonly used 27-item questionnaire that has been validated to measure IU in children from the general population (Comer et al., 2009). The IUS-C has been used to study relationships between IU, anxiety, and autism in autistic youth (Boulter et al., 2014; Keefer et al., 2024). However, the questionnaire's reliability for use with this population has yet to be fully evaluated.

Objectives: The objective of the present study is to (1) assess the reliability of the IUS-C when using it to measure IU in autistic adolescents, (2) compare IUS-C self-report scores to parent-report scores, and (3) compare scores across age groups.

Methods: As part of larger study about social skills in autistic adolescents, participants (N = 55) ages 11-17 ($M = 13.58$; 20% female) were given the IUS-C self-report questionnaire. Parents were given the IUS-C parent version of the questionnaire. Items are rated on a 5-point scale, and scores range from 27 to 135. Both questionnaires were completed via a Qualtrics survey. Adolescents included in the research had a confirmed autism diagnosis and were screened for Intellectual Disability diagnoses.

Results: The IUS-C self-report measure showed excellent internal consistency in a sample of autistic adolescents ($\alpha = .96$). The parent report measure also showed excellent internal consistency in this sample ($\alpha = .96$). For both questionnaires, the reliability would not be substantially improved by deleting any items. On the self-report measures, total scores were $M = 61.93$, $SD = 24.40$; on parent measures, total scores were $M = 66.05$, $SD = 23.61$. Using $\alpha = 0.05$, a paired-samples t test indicated that child self-report scores were not significantly different from parent scores, $t(54) = 1.115$, $p = .27$ (two-tailed), Cohen's $d_z = .15$. A Welch's ANOVA was conducted to compare the effect of age on self-report IUS-C score. The analysis revealed a statistically significant difference in means, Welch's $F(6, 19.624) = 3.71$, $p = .012$, $\eta^2 = .16$. Tukey's HSD Test for multiple comparisons did not find any specific group-to-group differences that were statistically significant. Descriptive statistics for each age group are in Table 1.

Conclusions: This study shows excellent reliability for the IUS-C when used to measure IU in autistic adolescents. Both the self-report and parent-report versions showed this reliability and there was not a significant difference between their scores. These results provide support for using the IUS-C with this population. In cases where it is not possible to get IUS-C scores from the adolescent, it may be appropriate to rely on parent report. Across ages, group differences in IUS-C scores exist but are subtle, which may reflect changes in understanding of the questions as adolescents get older.



440.246 Remote Monitoring of Key Social and Cognitive Processes in Neurogenetic Syndromes and Idiopathic Neurodevelopmental Conditions

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Background:

Individuals with autism and other neurodevelopmental (NDD) and neurogenetic (NGDs) conditions present with a wide range of social and communication difficulties that have a significant impact on their functioning. However, at present, there are no objective, scalable instruments for comprehensive characterization of social and neurocognitive aspects of autism, NDD and NGDs clinical phenotypes.

Objectives:

This study focused on the development and initial psychometric evaluation of a set of online, webcam-collected, and artificial intelligence-derived patient performance measures for autism, NDD and NGDs. The primary aim was to examine the psychometric properties of webcam-collected social attention measurements in three NGDs (PTEN Hamartoma Tumor Syndrome - PHTS, Malan Syndrome - NFIX, and SYNGAP1-related disorder - SYNGAP1), a mixed group of other NGDs, idiopathic NDD and autism. The secondary aim was to evaluate the construct validity of these performance measurements, including evaluating known-groups validity across study groups and concurrent validity for separating autism and non-autism cases.

Methods:

The remote, online webcam paradigms capturing social and cognitive processes, including social attention, receptive vocabulary, processing speed, and single-word reading, were administered to a sample of 467 participants aged 3-45 years (PHTS $n=102$, NFIX $n=23$, SYNGAP1 $n=42$, other NGDs $n=63$, idiopathic NDD and autism $n=53$, neurotypical siblings $n=71$, and unrelated neurotypical controls $n=113$). Participants completed paradigms at three timepoints (baseline, 1-month, and 4-month follow-up).

Results:

Good to excellent internal consistency reliability ($\alpha = 0.67$ to 0.95) was observed across measures. Test-retest reproducibility at 1-month follow-up and stability at 4-month follow-up was fair to good ($r = 0.40$ – 0.73) for 8 of the 12 measures. All gaze-based measures showed evidence of convergent and discriminant validity with parent-report measures of other cognitive and behavioral constructs. Unique patterns of emerged across study groups. For instance, in terms of social attention, there were near neurotypical levels in PHTS and weaker social attention in NFIX and SYNGAP1 relative to controls. Global social attention had good accuracy in detecting autism within neurogenetic syndrome participants.

Conclusions:

Webcam-collected performance measures appear to be a reliable and potentially useful method for objective characterization and monitoring of phenotypic profiles and tracking the natural history of distinct NDGs and idiopathic NDD as well as identifying autism within NDGs. Given their reproducibility and stability, social and cognitive processes captured using the existing, AI-enabled remote objective measurement protocol may be useful outcomes for future clinical trials.

440.247 Review and Comparison of Factor Analysis Models of the Childhood Autism Rating Scale 2 – Standard Version

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Background: Autism Spectrum disorder (ASD) is a neurodevelopmental disorder that is characterized in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, Text Revision (DSM-5-TR; American Psychiatric Association, 2022) by both impairments in social communication and interaction, and the presence of restricted and repetitive patterns of behaviors (RRBs) in the early developmental period. There have been several assessment measures developed for screening for and ASD, which include clinical observation, caregiver reporting, and objective performance on assessment measures. The Childhood Autism Rating Scale, Second Edition – Standard Version (CARS2-ST; Schopler et al., 2010) is a 15-item observation-based rating scale that is intended to provide brief, specific, and comprehensive information that can be used to help inform diagnosis for individuals suspected of having ASD. There have been several independent psychometric studies completed of the CARS (initial edition) and CARS2-ST, which have varied given the changes in diagnostic criteria for ASD and related disorders since 1980. Similarly, the factor structure has been explored by researchers both before and after the 2014 DSM-5 changes to the ASD diagnostic criteria; however, few psychometric studies have been completed since the DSM-5-TR was published in 2022.

Objectives: The present study was completed to provide an a-priori model of factor structures for the CARS2-ST in comparison to previous factor structures of the CARS2-ST.

Methods: The CARS2-ST was completed by a licensed psychologist with children referred for diagnostic evaluation at a tertiary diagnostic clinic. Participants were 304 children who received a primary diagnosis of ASD following a comprehensive psychological evaluation based on DSM-5-TR diagnostic criteria. The sample was predominantly male ($N = 225$, 74%) with a mean age of 42.15 months ($SD = 20.3$). The first and last authors conducted a review of the literature for prior research in factor analysis of both the CARS and CARS2-ST. The review of the literature informed a proposed three-factor structure model consisting of: *Social Communication*, *Emotional Dysregulation*, and *Stereotyped Behavior and Sensory Differences*. Both the first and last author independently sorted CARS2-ST items into the three factors, which resulted in favorable agreement across raters. Five models were evaluated using confirmatory factor analysis (CFA) using the R package *lavaan* (version 0.6.17) using maximum likelihood (ML) estimation.

Results: The proposed three-factor model resulted in a satisfactory fit to the data [Comparative Fit Index (CFI) = .93; Tucker-Lewis Index (TLI) = .92, Root Mean Square Error of Approximation (RSMEA) = .056; Standardized Root Mean Square Residual (SRMR) = .053] and demonstrated significantly better fit than the two-factor model identified in the CARS-2 manual (Schopler et al., 2010), and a two-factor model based on DSM-5-TR criteria.

Conclusions: A proposed three-factor model for the CARS2-ST consisting of Social Communication, Emotional Dysregulation, and Stereotyped Behavior and Sensory Differences may be useful in organizing and reporting CARS2-ST ratings. Future research should examine the invariance of the proposed model across important demographic variables, such as gender and race.

440.248 Screening Tool for Autism in Toddlers and Young Children (STAT) Training Follow-up Survey: Clinician Confidence, Feedback, and Barriers to Implementation

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Background: Due to significant resource shortages and limited availability of specialists, there has been a growing push to develop new diagnostic models and provide autism-focused training to primary care providers (PCPs). One training program, the STAT-MD model, utilizes one- to two-day workshops to provide training in conducting autism-focused assessments with toddlers and young children. Training components include performing interactive screening with the Screening Tool for Autism in Toddlers and Young Children (STAT), conducting developmentally sensitive caregiver interviews, formulating diagnostic impressions and communicating them to caregivers, and utilizing appropriate billing and coding procedures.

Objectives: While research has shown that this training can have a significant effect on PCPs' practice in clinic, there are also well-known barriers that likely limit its impact. It involves time-consuming workshops, expensive materials, and added tasks/responsibilities that make participating difficult for most "real-world" PCPs. In addition, these time-limited trainings do not provide participants with ongoing support to apply training content within their practice. To improve the quality and impact of future training efforts, we asked past training participants about their use of the STAT-MD model, barriers to implementation, and how the training affected their confidence in diagnosing autism.

Methods: Eligible participants ($N = 1190$) were pulled from our rosters from past STAT trainings (2004-2024) and invited to complete a one-time online survey through REDCap. 24% of attempted contacts did not go through, and only 6% of completed the survey, highlighting how these one-time trainings did not lead to sustained support and contact with participants. For participants that did respond ($N = 58$), we collected information about past training and current practice, number of STAT administrations and autism diagnoses since training, confidence in autism assessment-related practice behaviors (see Table 1), and any self-reported barriers to diagnosing autism in their practice.

Results: Participants' self-reported levels of confidence in implementing assessment-related practice behaviors increased after STAT training; Wilcoxon Signed-Rank tests indicated statistically significant increases across all practice domains (Table 1, $p < .001$). However, despite significantly increased clinician confidence in identifying, diagnosing, and discussing autism, only 64% of participants reported administering the STAT after training (range: 1-600 administrations), and only 54% reported diagnosing autism (range: 1-2200 diagnoses). Many participants endorsed multiple barriers to implementation (Table 2) and provided feedback on further needs for support.

Conclusions: Even though only a fraction of past training participants completed our survey and implemented the STAT, those who did reported significantly increased confidence across practice domains and substantial within-practice contributions (2304 administrations of the STAT and 5955 autism diagnoses). This suggests that even with their practical limitations, training approaches that seek to equip PCPs can have a sizable influence on their communities. In order to maximize the impact of future training models, it will be important to address identified barriers to implementation and establish mechanisms for continued support to ensure successful application of learned content. Preliminary strategies (e.g., continued contact and follow-up via additional training sessions and recurring needs surveys) and novel resources, developed with these goals in mind, will be summarized and shared.



440.249 Self-Reported Adequacy of Supports and Information for Autistic Adults: Instrument Validation and Preliminary Investigation of Predictor Variables

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Background: Disabled people may have trouble getting all of their needs met due to lack of available supports and information. It is crucial to assess how satisfied individuals feel with support they receive (from both formal disability services or informal support systems) in order to know how to best support disabled people. However, little research has investigated the adequacy of supports from the point of view of autistic adults. Furthermore, measures to assess self-reported adequacy of supports have not been developed for or tested specifically with autistic individuals.

Objectives: 1) assess the factor structure of a self-report adequacy of supports scale (modified from a prior scale developed for use with adults with intellectual/physical disabilities); 2) use the measure to characterize adequacy of supports in a sample of autistic adults; 3) assess factors that are associated with adequacy of support and information.

Methods: Autistic adults throughout the United States filled out the 9-item AASPIRE Adequacy of Supports and Information Scale (a modified version of two subscales of the Quality of Care and Support scale [Lucas-Carrasco et al., 2011]) as part of a longitudinal cohort study. Participants were recruited from healthcare and disability service settings, as well as via community organizations, social media, and word of mouth (“community cohort”). Items were rated on a scale from 1=not at all to 5=totally supported; the two subscales were named *Supports* and *Information*. N=738 participants filled out the instrument (30.6% Female, 35.2% Male, 33.3% other; 28.5% identified as BIPOC; 61.5% non-heterosexual; 29.9% reported receiving disability services). The existing 2-factor structure was assessed with the confirmatory application of exploratory equation modeling. Binary logistic regression was used to assess predictors of feeling adequately supported (defined as feeling on average “totally” or “mostly” supported).

Results: Fit for the 2-factor model was excellent across most fit statistics (CFI = .983, TLI = .968, RMSEA (90% CI) = .103 (.089, .117), SRMR = .022); all items loaded as expected with minimal cross-loading (see Table 1). Average scores (out of 5) for the Supports subscale (M=3.94, SD=1.03) approximately corresponded to feeling “mostly” supported. Average scores for the Information subscale (M=3.14; SD=1.05) corresponded to feeling “moderately” supported. Our preliminary regression model was significant ($X^2 = 177.85, p < .001$) and predicted 33.4% of the variance (Nagelkerke R^2). Being satisfied with supports was associated with higher self-determination, identifying as white, being in the healthcare or disability cohort versus community cohort, identifying as male versus non-binary/gender-fluid/agender, and reporting greater informational social support on a separate Social Support measure (see Table 2).

Conclusions: This study serves as an initial validation of a self-report adequacy of supports and information instrument for autistic adults. On average, participants in our diverse sample reported fairly high satisfaction with both supports and information about available supports. However, preliminary results indicate that some individuals, such as racial and gender minorities, would benefit from additional support. More research is needed to further assess the nature of these relationships, for example with regards to intersectionality and causal influences.



440.250 Sex Assigned at Birth and Diagnostic Status Considerations in Outcome Measures for Children with Late-Diagnosed Autism

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Background: While much progress has been made in early identification and diagnosis of autism spectrum disorder (ASD), many children are not identified as having ASD until school age or later (Sheldrick et al. 2017). Females (sex assigned at birth) may be more likely to be diagnosed late (Shattuck et al. 2009), and may show different symptom profiles over time, particularly in their restricted and repetitive behaviors (Kaat et al. 2020). Emerging evidence suggests that children diagnosed with ASD late (i.e., after age 5) show comparable difficulties with social skills, but are less likely to show unusual preoccupations, rituals, or repetitive motor movements than those diagnosed in early childhood (Goodwin et al. 2019). Little is known surrounding profiles of co-occurring symptoms in late-diagnosed males and females.

Objectives: Examine sex and diagnostic status differences in current social affect (SA), restricted and repetitive behavior (RRB), emotional-behavioral functioning, and adaptive functioning in late-diagnosed males and females with ASD.

Methods: Participants included 140 children (25% female) who received comprehensive ASD evaluations in the Autism and Neurodevelopment Clinic at the University of Minnesota. Inclusion criteria were: (1) seen for first time ASD diagnostic evaluation at or after age 5; and (2) had fluent speech. ASD symptoms in the SA and RRB domains were measured using the Autism Diagnostic Observation Schedule, 2nd Edition (ADOS-2). Emotional-behavioral functioning was measured using the externalizing (EXT) and internalizing (INT) composite indices from the Behavior Assessment System for Children, 3rd Edition (BASC-3). Adaptive functioning was measured using the adaptive behavior composite score from the Vineland Adaptive Behavior Scales, 3rd Edition (VABS-3). A factorial Analysis of Variance tested the main effects of ASD diagnosis and sex, as well as their interaction.

Results: There was a main effect of diagnostic status on both SA and RRB total scores ($p < 0.001$), as well as a main effect of sex on RRB total scores only ($p = 0.03$). There was a main effect of sex on INT composite indices ($p = 0.01$), as well as a main effect of diagnostic status on EXT composite indices ($p = 0.02$). There were no interaction effects of sex and diagnostic status on any of the dependent variables.

Conclusions: While we observed diagnostic group differences in SA and RRBs, there were smaller group differences in internalizing problems and adaptive behavior. This likely reflects that children referred for ASD evaluations generally have emotional-behavioral and adaptive skill challenges. Females scored lower than males on the RRB total scores, regardless of ASD diagnosis (Messinger et al. 2015; Lai et al. 2020). Females also scored higher on BASC internalizing problems, regardless of diagnosis, highlighting the need to understand these specific challenges for females within the context of societal expectations. Considering co-occurring symptoms in late-diagnosed children can lead to more effective, targeted treatments. It will be important to consider sex differences in the general population and non-diagnosed clinically-referred children. Some sex differences may not be ASD-specific but exist across the spectrum of ASD concern.

**440.251 Sex-Specific Clustering in Autism: Implications for Female Identification and Assessment**

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Background: Autism presents with significant heterogeneity across a variety of domains. To address this variability and provide personalized support for autistic individuals, accurately identifying and characterizing subgroups within autism is essential. A data-driven approach can provide valuable insights into the identification of distinct subgroups in autism. Growing evidence suggests sex-specific differences in symptom presentation (Lai et al., 2015). Recent studies indicate that autism may present differently in females, potentially leading to underdiagnosis or misdiagnosis in girls and women (Loomes et al., 2017; Hull et al., 2020). In this study, we identified subgroups of autism, and examined how these groupings vary by sex assigned at birth.

Objectives: To identify distinct clusters (i.e., phenotypes) within autism and investigate the relationship between these clusters and sex, with a focus on autistic females.

Methods: Participants included 99 individuals (55 autistic (AUT), 44 neurotypical[NT]). AUT group: 35 males, 20 females; NT group: 23 males, 21 females. AUT (mean±SD: 15.5±1.6) and NT (mean±SD: 14.6±1.9) groups differed significantly on age ($t=2.61$, $p=0.01$, $d=0.52$), with the AUT group being slightly older. However, they did not differ significantly in cognitive estimates ($t=0.32$, $p=0.75$, $d=0.07$) or sex ratio ($\chi^2=0.87$, $p=0.35$, $V=0.07$). Unsupervised k-means clustering was applied using a set of measures including participant self-report measures of thoughts and feelings (BASC-3 SRP, MASC-2), parent-reported social behavior and behavioral/emotional functioning (SRS-2, BASC-3 PRS), and clinician-administered assessments (CRS, OARS). Uniform Manifold Approximation and Projection (UMAP) was used for dimensionality reduction. Covariate-adjusted analyses controlling for age and cognitive estimates were conducted using linear regression models.

Results: UMAP analysis revealed two key dimensions (see Figure): UMAP1, strongly associated with behavioral and emotional traits (correlating strongly with behavioral symptoms index, adaptability, social motivation, and depression; r 's = 0.75-0.83), and UMAP2, primarily capturing cognitive and regulatory features (showing correlations with attention, cognitive regulation, and behavioral control measures; r 's = 0.68-0.79). Two distinct clusters emerged: AUT_A ($n=36$) scored higher on social-behavioral challenges (UMAP1), while AUT_B ($n=19$) had fewer emotional regulation issues (UMAP2). AUT_B also had lower internalizing symptoms (anxiety, depression, panic) and higher positive traits (self-esteem, adjustment) than AUT_A ($p<0.001$). AUT_B scores were closer to NT scores, suggesting a milder presentation. NT_A and NT_B differed, with NT_B showing more emotional regulation challenges. AUT_B was predominantly male (84.2%), while AUT_A had a more balanced gender ratio (52.8% male). Females were more likely to be in AUT_A (89.5%) than males (61.1%) ($p<0.05$).

Conclusions: Our study identifies two distinct AUT clusters, AUT_A and AUT_B, with clear sex differences. AUT_B, with milder symptoms, overlaps significantly with typically developing controls, especially in anxiety, depression, self-esteem, and locus of control. Females are overrepresented in the more severe AUT_A cluster, while those in AUT_B may go undetected due to camouflaging behaviors or diagnostic tools that lack sensitivity to sex-differentiated manifestations of autism symptoms. As a result, females with AUT_B traits, resembling typically developing peers, might face a higher risk of delayed or missed diagnoses. These findings emphasize the need to consider sex-sensitive diagnostic tools to detect subtler autism presentations in females.



440.252 'Mind Readers': The Italian Version of the Short Story Task to Assess Theory of Mind in Autistic and NON-Autistic Adults
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Background:

The ability to attribute mental states, conceptualized as Theory of Mind (ToM), has been found to be decreased in autistic individuals, leading to the hypothesis that ToM alterations may underpin difficulties in social functioning in autism. However, standard ToM tasks often suffer from ceiling effects when administered to adults, being mostly adapted from measures for children. The Short Story Task (SST) seems less prone to ceiling effects and incorporates a range of mental states which are representative of real-world social interactions.

Objectives:

Our primary aim was to determine if the understanding of characters' mental states, as measured by the SST-MS, was decreased in autistic subjects compared to non-autistic subjects from a non-clinical population. As a secondary aim, we explored the potential of this measure to predict autism diagnosis and identify a reliable cutoff to distinguish autistic from non-autistic individuals.

Methods:

We enrolled all consecutive admissions for autism diagnostic assessment since September 2021. Non-clinical control subjects (CT) were recruited in the general community. We included participants in the age range 18-55 years who were Italian speakers, with at least 8 years of education. Exclusion criteria were IQ < 100 and SST comprehension subscale < 5 points. For CT, we also excluded individuals with previous psychiatric diagnoses, substance abuse problems, presence of clinically relevant psychiatric symptoms or history of psychoactive drug use for more than 6 months. SST was administered as follows: after reading a short story by Ernest Hemingway, participants were asked questions that assessed mental state reasoning (SST-MS) and comprehension of non-mental content (SST-C). An investigator blind to SST outcome conducted the ADOS-2 interview. IQ was measured with WASI-II.

Results:

Participants were 33 autistic individuals (16 M and 17 F) and 32 non-autistic individuals (16 M and 16 F). No significant difference was found between the two groups in sex assigned at birth, numerosity, age, IQ. A difference in education years was found between the two groups (AUT 16,09 years, CT 17,88 years, $p=0,0032$). A significant difference ($p=0,0026$) was found between average scores in SST-MS (AUT 7,061, CT 9,156). Selecting a cut-off of 8 resulted in a sensitivity of 69,70% and a specificity of 68,75% in identifying autistic adults when scores below this threshold were obtained. A significant ($p=0.0074$) but smaller difference in SST-C was found between AUT (8,970) and CT (9,625) groups.

Conclusions:

SST-MS seems to be a promising support tool to include in the diagnostic assessment of autism since it seems able to highlight individual differences in the ability to infer mental states in clinical and non-clinical populations. Unlike gold standard diagnostic tools, no specific training is needed for administration of SST. Inter-rater reliability confirmed that it is an easy tool to master. However, sensitivity and specificity can easily change depending on the population analyzed, therefore, it is necessary to recruit a larger number of cohorts, potentially determining different cut-offs based on socio-demographic and cognitive characteristics.

440.253 Socioeconomic Status and Adaptive Function in Autistic Children: Results from the Autism Biomarkers Consortium for Clinical Trials (ABC-CT)

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Background: Previous literature reports that children with autism spectrum disorder (ASD) have significant weaknesses in adaptive functioning that impact their self-sufficiency and quality of life. While lower cognitive ability and greater autism symptom severity have been associated with lower adaptive functioning, other factors such as socioeconomic status (SES) may impact adaptive functioning. For example, SES could impact accessibility to healthcare, timeliness in diagnosis, and intervention for ASD, all of which may relate to variability in adaptive functioning.

Objectives: The current study aimed to investigate the extent to which socioeconomic factors explain variability in adaptive functioning scores in a large and geographically diverse sample of autistic children.

Methods: Data were collected across five U.S. sites (Yale University, Boston Children's Hospital, Duke University, University of Washington, and University of California, Los Angeles) through the Autism Biomarkers Consortium for Clinical Trials (ABC-CT). 280 autistic children (ages 6-11) were included ($M_{\text{age}} = 8.53$ years, $SD = 1.63$; 74.68% male; 72.18% white). ASD diagnoses were confirmed with the Autism Diagnostic Observation Schedule-2nd Edition, Autism Diagnostic Interview-Revised, and clinician endorsement of DSM-5 criteria for ASD. Sociodemographic information including yearly household income and parental education was obtained from caregivers. Parent-reported adaptive functioning skills were assessed by the Vineland Adaptive Behavior Scales-3rd Edition (Vineland-3). Household-level economic status was estimated using the income-to-needs ratio (INR) by dividing an individual's household income by the U.S. Census Bureau-based poverty threshold that accounts for family size. Neighborhood SES was estimated by dividing annual household income by the median income for the participant's postal code derived from publicly available census data.

Results: Multiple regression was used to predict Vineland-3 Composite scores from INR, neighborhood SES, and parental education. The overall model was significant ($F(4, 244) = 7.12, p < .001, R^2 = .1045$). INR ($\beta = 1.52, t = 3.61, p < .01$) emerged as a significant predictor of composite scores. A second multiple regression analysis was conducted to examine INR, neighborhood SES, mother's education level, and father's education level as predictors of the Vineland-3 Communication domain score. The overall model was significant ($F(4, 244) = 11.10, p < .001, R^2 = .154$). INR ($\beta = 1.60, t = 2.87, p < .01$), mother's education level ($\beta = 0.85, t = 2.15, p < .05$), and father's education level ($\beta = 0.75, t = 2.34, p < .05$) emerged as significant predictors of communication scores. Both mothers' ($r = .42, p < .05$) and fathers' ($r = .38, p < .05$) education levels were moderately correlated with INR.

Conclusions: These results suggest that individual and contextual socioeconomic factors have a significant role in predicting adaptive behavior and communication skills in autistic children. Specifically, family income relative to need and parental education were significant predictors. These findings emphasize the importance of addressing socioeconomic inequalities, particularly in access to educational resources and intervention services, to better support families of autistic children from lower socioeconomic backgrounds.

440.254 Stability of Early Identification for Toddlers with Autism Spectrum Disorder before Age of 3 Years: A 5-Year Follow-up
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Background: Autism spectrum disorder (ASD) is thought as an innate neurodevelopmental disorder and characterized by impaired social communication and social interaction, as well as restricted and repetitive patterns of behavior and interest. Recently, the prevalence of ASD increases significantly beyond than 2 in 100 children (Li & He, 2024; Wallis et al., 2023). The increasing prevalence highlights the importance of the early identification. In addition, the importance of early detection for ASD is underscored by the benefits of early intervention (e.g., Fuller et al., 2020; Gabbay-Dizdar et al., 2022).

Objectives: Previous studies supported that early diagnosis of children with ASD appears to be stable in children as early as age 3. However, few studies examined long-term stability and change of early detection for toddlers with ASD, especially for young children before age 3. In this current study, a longitudinal design was used to examine stability and change of early identification for toddlers with ASD before 36 months of age.

Methods: There were 125 toddlers with developmental disabilities before 36 months of age including 59 toddlers with ASD and 66 toddlers with developmental delays (DD) from Southern of Taiwan. These participants who had administrated all of the Taiwan version of the Screening Tools for Autism in Two-Year-Olds (T-STAT; Chiang et al., 2013), Modified Checklist for Autism in Toddlers (M-CHAT; Wong et al., 2018) and Autism Diagnostic Observation Schedule (ADOS; Lord et al., 1999) between 18 and 36 months of age (Time 1, mean chronological age = 25.6 months) and received re-assessment for diagnostic reassessment after 5 years (Time 2, mean chronological age = 86.8 months). At Time 2, all participants were assessed and diagnosed according to DSM-5 and with reference to developmental history and current concerns from parents, results of cognitive and adaptive function measures, observations of the child, and the results of ADOS by a multidisciplinary team.

Results: Based on classification of the T-STAT (cutoff = 2.25 or 2) at Time 1, the results showed that the sensitivity and specificity are .78 and .70, respectively. In addition, according to classification of the M-CHAT (cutoff = 4) at Time 1, the results indicated that the sensitivity and specificity are .71 and .61, respectively. While, the Brief-14 (cutoff = 4) revealed that both the sensitivity and specificity are .71. Finally, with reference to classification of the ADOS (Time 1), the results showed that the sensitivity and specificity are .85 and .79, respectively.

Conclusions: The results of this current study showed that early identification or diagnosis for toddlers with ASD was reliable before age 3 and have good long-term stability. In addition, the findings of this study revealed that all of the T-STAT, M-CHAT (i.e. Brief-14) and ADOS are promising tools to differentiate toddlers with ASD and those with DD before 36 months of age. The findings also supported that toddlers with ASD could be detected or diagnosed as early as age 3 and then provided with early intervention.

440.255 Standardized Assessment of Strengths, Challenges, Barriers and Facilitators in Autism: Pilot Validation of the ICF Core Sets Platform

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Background:

Functioning, not to be confused with impairment, is a multifaceted construct that emerges in interaction between an individual's strengths and challenges and facilitating and hindering environments. WHO's International Classification of Functioning (ICF) applies a model integrating biological and psychosocial dimensions of functioning. To facilitate use of the ICF, ICF Core Sets for autism have been developed in cooperation with WHO, ICF Research Branch, researchers, clinicians, and stakeholders from all WHO regions (Bölte et al., 2024). Core Sets are shortlists of the ICF pertaining only the most relevant areas of functioning within a certain diagnosis. ICF Core Sets for autism have been validated in educational and clinical settings and are now operationalized as rating scales on an internet platform for user friendly application.

Objectives:

The objective of this study was to pilot the validity of the ICF Core Set rating scales for autism. Particularly, we sought to examine whether self-reported autistic functioning profiles in terms of the ICF domains of body functions, activities and participation, and environmental factors would mimic current research evidence on strengths and challenges of autistic people, and environmental barriers and facilitators they encounter.

Methods:

The digital ICF core set rating scales for autism were piloted in a group of 48 adolescents and adults (17-65y, M=38.9, SD=12.3; 35 female) diagnosed with autism and 203 (17-82 y, M=43.4, SD= 15.2; 110 female) neurotypical participants. ICF profiles per group (autism vs. neurotypical) were analyzed and compared on ICF domain and item levels. In addition to self-ratings, a subset was also assessed by a proxy-ratings. For 107 individuals paired assessments were collected to determine inter-rater agreement

Results:

Autistic individuals perceived most environmental factors as significantly more hindering than neurotypical participants. Some items, such as melatonin and assistive products for school and daily life, were rated as more helpful by the autistic group. They reported higher scores for body functions like curiosity, trustworthiness, and responsibility, and low scores for appropriateness of emotional involvement, control over thoughts, and adaptability. In the domain of activities and participation, autistic individuals scored higher than neurotypical participants on avoiding alcohol, tobacco use, and sexual risks, but lower on adapting to changes in daily routines, managing stress, and new situations. For instance, in the domain activities and participation, the intraclass correlation for Demands and Changes (d240, d250) was high at 0.85 (95% CI: 0.79-0.92). In contrast, it was lower for Giving Information (d330), at 0.46 (95% CI: 0.16-0.65).

Conclusions:

Results indicate that the digital ICF core sets rating scales generate valid information on functioning profiles in autism regarding both individual strengths and challenges and environmental facilitators and barriers. These results give a balanced and holistic picture of functioning in autism beyond clinical diagnosis and symptomatology to serve support planning, environmental adaptations to needs, and strengths-based approaches. Larger scale data collections on the ICF CoreSets platform and psychometric evaluation is required to make firm conclusions about its usefulness and scientific properties. These studies are currently in progress.

440.256 Streamlining Autism Diagnostics: A Machine Learning Approach to Simplifying the ADOS-2 for Accessible ASD Assessment

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Background: The Autism Diagnostic Observation Schedule-2 (ADOS-2) is a widely used tool for diagnosing Autism Spectrum Disorder (ASD), designed to assess key areas such as communication, social interaction, and repetitive behaviors. However, the administration of the ADOS-2 is resource-intensive, requiring specialized training and significant financial investment, leading to delays in diagnosis and limited availability, particularly in certain geographic regions. Additionally, the increasing prevalence of ASD in the United States has placed further strain on the healthcare system, exacerbating these barriers. As a result, many children face significant obstacles in obtaining a timely ASD diagnosis, crucial for accessing early intervention services. This study aims to explore ways to reduce the complexity and cost of the ADOS-2 assessment by identifying key predictive items, thereby improving accessibility to diagnosis and care.

Objectives:

- Identify key predictive items from the ADOS-2 that can reduce the complexity and financial burden of the assessment.
- Determine whether a reduced set of items from the ADOS-2 can accurately predict overall ASD severity scores.

Methods: This study utilized existing data from 108 children aged 4 to 13. Of these participants, 50 were classified as non-autistic, 58 were categorized as having ASD. A recursive feature elimination (RFE) algorithm was employed to identify and reduce the number of ADOS-2 features, narrowing them down to the most impactful ones. The five most prevalent features identified through RFE were then tested using a multivariate linear regression model to assess their correlation with the final ADOS-2 severity score. A simple linear model was selected to avoid the risk of overfitting, ensuring the model's results would be more generalizable to other populations. This approach allowed for a streamlined analysis, focusing on the most predictive features without compromising the robustness of the findings.

Results: The analysis identified five key features from the ADOS-2 assessment that played a critical role in predicting the overall ASD severity score: echolalia, stereotyped words, conversation, eye contact, and quality of rapport. Using a multivariate linear regression model, these features were found to be highly predictive of the final ADOS-2 score. The Pearson correlation coefficient for this model was 0.94, indicating a strong positive correlation between these five features and the overall severity score. This suggests that these core features alone can serve as reliable predictors of ASD severity, significantly reducing the complexity of the ADOS-2 while maintaining diagnostic accuracy.

Conclusions:

- A reduced set of five features may accurately predict ADOS-2 severity score, simplifying the assessment process.
- Streamlining ADOS-2 assessment could make ASD diagnosis more accessible and cost-effective without sacrificing diagnostic reliability.
- Nevertheless, further research is required to validate these findings in larger and more diverse populations, and to explore the potential for integrating these key features into a simplified diagnostic tool for broader clinical use.

440.257 Tele-ASD-Kids: A Telehealth Diagnostic Protocol for School Aged Children

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Background:

Accurate ASD diagnosis is important for improving outcomes. However, obtaining traditional ‘gold standard’ in-person assessments can be challenging due to accessibility (e.g. distance, transportation, childcare). These issues were heightened during the COVID-19 pandemic, spurring researchers to create and validate telehealth assessments.

Objectives:

Using the Tele-ASD-Peds (TAP; Corona et al., 2020) and Tele-ASD-KIDS (TAK; Stavropoulos et al., 2022), we measured the accuracy of diagnosis using telehealth. This is the first time sensitivity, specificity, and ‘cut-off points’ for scoring the TAK is presented.

Methods:

Participants (n = 39) were seen twice: telehealth, and in-person, by separate clinical teams. Teams were blinded to each other’s impressions. When disagreements occurred, teams met to determine a final diagnosis. Both the TAP and TAK used a Likert scoring system from 1-3, where 3 indicates behavior indicative of ASD. Clinician confidence/certainty was measured using a Likert scale where higher scores indicate higher confidence.

Results:

For the TAP (n = 10), sensitivity was 87.5%, specificity could not be calculated as no ‘true negatives’ were found. A cut-off score of 17.5 yielded sensitivity of 77.8% and specificity of 100% (min-max score = 7-21).

For the TEK module 2 (n = 7), sensitivity and specificity were 100%. A cut-off score of 15 yielded sensitivity and specificity of 100% (min-max score = 9-27).

For the TEK module 3 (n = 22), sensitivity was 50% and specificity was 64.2%. A cut-off score of 16.5 yielded sensitivity of 75% and specificity of 50% (min-max score = 10-30).

Participants were separated into three groups based on in person—telehealth diagnostic impressions: ASD—ASD (n = 16), disagreement about ASD/no ASD (n = 14), or no ASD—no ASD (n = 9). ANOVAs revealed a significant effect of group on telehealth clinician confidence ($p = .047$) such that clinicians were less confident in their diagnostic impressions related to children in the ‘disagreement’ versus other groups, and age ($p = .002$), such that children in the ASD-ASD group were younger than those in the other groups. As expected, TAP, TAK, and ADOS-2 scores were highest for the ASD—ASD group, and lowest for the No ASD—No ASD group (all $ps > .05$).

Conclusions:

The current study is the first, to our knowledge, to measure diagnostic accuracy of telehealth with traditional in-person assessment with verbal children. Most telehealth assessments for ASD focus on young, minimally verbal children (e.g. BOSA, TAP). Results indicate high sensitivity and specificity for children with phrased speech (‘module 2’), but less reliable results for children with fluent speech (‘module 3’). It is not clear whether decreased accuracy for older children versus younger is a limitation of the measure itself (e.g. if refinement to the TEK ‘module 3’ would improve accuracy) or if results highlight diagnostic complexity of older children presenting for an initial diagnosis. It may be that telehealth is less reliable with older children who have fluent speech due to the subtle nature of social challenges or the need for nuanced differential diagnosis (e.g. distinguishing between ADHD, ASD, or both).

440.258 Telehealth and Autism Diagnosis: Who Slips between the Cracks?

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Background: Although research suggests the potential effectiveness of telehealth for autism diagnosis, there remains a gap in understanding the accuracy of telehealth diagnoses and for whom a telehealth assessment may not be appropriate (Stavropoulos et al., 2022).

Objectives: We aim to investigate what factors interfere with accurate autism assessments via telehealth.

Methods: All children (N=39) participated in two autism assessments: a telehealth assessment (either Vanderbilt TELE-ASD-PEDS; Corona et al., 2020 or Tele-ASD-KIDS; Stavropoulos et al. 2021, based on level of expressive language) and an in-person assessment (ADOS-2; Lord et al., 2012). The order of assessments was randomly assigned. Clinicians were blinded to the diagnostic impressions of the other assessment team until both appointments were completed. Parent measures were collected, along with cognitive ability assessments.

Results: Teams agreed on 25 cases and disagreed on 14. For cases where a disagreement occurred, teams met and decided on a final diagnosis. In 12/14 cases, the final diagnosis aligned with the in-person assessment, in the remaining two cases, the final diagnosis aligned with telehealth. Independent-sample t-tests revealed significant effects of participant age on clinician agreement for the disagree (M = 99.43 months, SD = 37.48) and agree (M = 74.88 months, SD = 38.09) groups, $t(37) = 1.941$, $p = 0.03$, such that children were older in cases of clinical disagreement versus agreement. Chi-square analysis (figure 1) examining effects of diagnosis type on diagnostic agreement was significant, $\chi^2(1, N = 39) = 3.80$, $p = 0.05$, such that there was more disagreement between clinicians for individuals who did not have autism but had a different condition (i.e., ADHD, intellectual disability (ID)). Figure 2 shows final clinical impressions and agreement. The problem behaviors domain of the Social Skills Improvement System (Gresham & Elliot, 2008) revealed marginally significant differences between the agree (M = 122.90, SD = 30.62) and disagree (M = 139.50, SD = 17.32) groups, $t(29) = 1.58$, $p = 0.06$, such that children with more reported problem behaviors were more likely to have diagnostic disagreement. Additionally, there was a marginally significant difference between the agree (M = 67.68, SD = 17.92) and disagree (M = 77.79, SD = 11.80) groups on parent-reported communication on the Vineland Adaptive Behavior Rating Scale 3 (Sparrow et al., 2016), $t(36) = 1.55$, $p = 0.06$, such that children for whom there was diagnostic disagreement tended to have more adaptive communication challenges.

Conclusions: Age and diagnostic factors influenced clinician agreement in telehealth contexts. We hypothesize that older children present with increased clinical complexity (e.g., less stereotyped speech and restrictive and repetitive behavior), which likely increases the discrepancy. Additionally, presence of non-autism conditions, such as ADHD and ID, affected clinical agreement. This may be due to the overlap in behavioral symptoms between autism and other diagnoses impacting social skills (e.g., ADHD), making it challenging for telehealth teams to distinguish and observe nuanced behaviors needed for an accurate diagnosis.



440.259 Testing the Reliability and Validity of the 3Di-Adult, an Informant-Report Interview for Use in Adult Autism Assessment
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Background:

A resource-efficient, well-validated interview to collect informant reports for the assessment of autism spectrum disorder (henceforth 'autism') in adults is needed. The 3Di-Adult, which collects information about current and pre-adulthood autistic characteristics, as specified in DSM-5 and ICD-11, could potentially fill this gap in practice. Many adults seeking autism assessment do not have an informant, e.g., a parent, who can report on their pre-adulthood. Therefore, we developed a version of the 3Di-Adult ('the 3Di-Adult-Current') that limits questions to current behaviours. To understand their suitability for clinical use, investigation is needed of how the 3Di-Adult and 3Di-Adult-Current perform in the settings for which they are primarily designed, namely, adult autism assessment services.

Objectives:

We aimed to test the reliability and validity of the 3Di-Adult and 3Di-Adult-Current by estimating their: (i) consistency of scores over time; (ii) agreement with other autism measures; (iii) capacity to predict diagnostic outcomes of independent clinical assessments for autism.

Methods:

We recruited 148 people about to receive an adult autism assessment from one of three English NHS trusts (mean age=37.1 years, mean verbal IQ=104.2, 77 [52%] women, 126 [85.1%] identifying as 'White'). Sixty-two percent subsequently received a clinical autism diagnosis. Prior to assessment, each nominated a 'historic informant' (someone who knew them since childhood) to do the 3Di-Adult (n=104) and/or a 'current informant' (someone who knows them now, but not in childhood) to do the 3Di-Adult-Current (n=121). In addition to the 3Di, historic informants completed the Relatives Questionnaire (RQ), which is a retrospective-report version of the Childhood Autism Spectrum Test (CAST). Participants awaiting autism assessment completed the 10-item Autism Spectrum Quotient (AQ-10) and the Empathy Quotient (EQ). Informants were invited to repeat the interview after ~8 weeks, to assess test-retest reliability. Using ROC analysis, we evaluated the interviews' ability to predict subsequent outcome (autism v not autism) of clinical autism assessment, which was blind to 3Di scores.

Results:

The 3Di-Adult (mean administration time=56 minutes) and 3Di-Adult-Current (mean administration time=38 minutes) showed good internal consistency (α 's $\geq .79$) and test-retest reliability (ICCs $\geq .80$). Both interviews correlated in the expected direction, albeit it modestly, with the EQ (3Di-Adult $r=-.36$; 3Di-Adult-Current $r=-.26$). The 3Di-Adult was strongly associated with the RQ (r 's $\geq .69$). People diagnosed as autistic attained higher 3Di scores than those not diagnosed autistic (Cohen's D's .40-.67). However, on our key test of validity, neither the 3Di-Adult nor the 3Di-Adult-Current diagnostic algorithms were acceptably accurate at predicting clinical autism diagnosis (all AUC's $\leq .69$).

Conclusions:

When used in adult autism assessment services, the 3Di-Adult and 3Di-Adult-Current diagnostic algorithms are not, on their own, adequate predictors of diagnostic outcome. Nevertheless, the interviews are reliable and resource effective: they can be one component of a multi-modal adult autism assessment, collecting qualitative information in a structured way to inform expert clinical discussion.

440.260 The Interrelationships Among Cognitive Ability, Symptom Severity, and Adaptive Behavior in Toddlers with Autism Spectrum Disorder: A Cross-Lagged Panel Analysis

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Background: To date, the association among cognitive ability, symptom severity, and adaptive behavior in young children with autism spectrum disorder (ASD) has been widely discussed and extensively scrutinized. Previous studies have established the significance of the well-documented correlation among these variables, which may influence developmental outcomes in ASD. However, few studies have focused specifically on toddlers with ASD. To investigate whether predictive relationships exist among cognitive ability, symptom severity, and adaptive behavior in toddlers with ASD, and to provide a more precise direction for early interventions, we conducted this study.

Objectives: This study examines the transactional relationships among cognitive ability, symptom severity, and adaptive behavior in toddlers with ASD. Based on previous research findings, we hypothesized that: (1) each variable would predict itself over time; (2) cognitive abilities would predict both autistic symptom severity and adaptive behaviors; and (3) autistic symptom severity would predict both cognitive abilities and adaptive behaviors.

Methods: We recruited 80 toddlers with ASD (69 males, 11 females), aged 18 to 35 months at the first assessment (Time 1, T1), and followed up 18 months later (Time 2, T2), when they were 36 to 54 months old. Assessments at both time points included: (1) cognitive abilities measured by the Mullen Scales of Early Learning (MSEL; Mullen, 1995), with the Developmental Quotient (DQ) calculated to represent cognitive abilities; (2) autistic symptom severity assessed through the Autism Diagnostic Observation Schedule (ADOS; Lord et al., 1999), represented by the sum of scores from the social affect and reciprocal social interaction domains (hereafter, symptom severity); and (3) parent-reported adaptive behaviors using the Adaptive Behavior Assessment System-Second Edition (ABAS-II; Harrison et al., 2003), represented by general adaptive composite score (GAC). A cross-lagged panel analysis examined the interrelationships among the variables across two time points, controlling for chronological age (CA).

Results: After controlling for participants' CA, which was considered a confounding variable, all three cross-lagged models (i.e., DQ and symptom severity, DQ and GAC, and symptom severity and GAC) showed excellent model fit. In terms of temporal stability, the autoregressive paths in all models were significant. In the main analysis of cross-lagged effects, the effect of DQ at T1 on symptom severity at T2 was significant ($\beta = -0.27$, $p = 0.01$), as was the effect of symptom severity at T1 on GAC at T2 ($\beta = -0.24$, $p = 0.02$). However, no significant cross-lagged effects were found in the 'DQ and GAC' model.

Conclusions: The results demonstrate the stability effects among cognitive ability, symptom severity, and adaptive behavior were significant over time in toddlers with ASD. Moreover, we found that cognitive ability significantly predicted symptom severity, and the symptom severity was a significant predictor of adaptive behavior in toddlers with ASD over an 18-month period. These findings underscore the importance of early intervention strategies tailored to the interrelated development of these abilities in toddlers.

440.261 A Novel Approach to Ascertaining Autism Risk from Birth

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Background: Autism spectrum disorder (ASD) has no defined biomarkers for diagnostics or novel drug discovery, though identifying such targets could allow for early, definitive diagnosis of ASD risk, unlocking the opportunity to utilize earlier treatments and meeting developmental milestones nearer to an age-appropriate time. One such potential biomarker includes a functional node of calcium signaling proteins associated with a major synaptic cluster of GWAS-associated ASD loci.

Objectives: We aimed to develop a Ca^{2+} signaling assay that will be adopted as an ASD risk detection test.

Methods: We have previously reported defective IP_3 -mediated intracellular Ca^{2+} release in skin fibroblasts from monogenic ASD syndromes (*fmr1*, *tsc1*, *tsc2*), and identified an associated defect in single channel gating of this ER resident calcium channel. Using novel superresolution imaging technologies to resolve single channel kinetics of the IP_3R within intact cells, we have reported reduced mean open-time (an unstable flicker opening) and therefore low flux, while channel abundance, selectivity, conductance, and latency are unchanged. A high-throughput FLIPR screen was used to image global IP_3 -mediated Ca^{2+} signals from the IP_3R channel.

Results: These were revealed as depressed signals from P2Y purinergic stimuli, first in a broader set of monogenic ASD syndromes, but also in skin fibroblasts from sporadic ASD subjects, validated with research-grade ADOS testing. ROC curves generated from IP_3 -mediated calcium signals in normotypic and autism fibroblasts can distinguish at 84% AUC high sensitivity and specificity for both syndromic and sporadic ASD samples, which signal with a small, slow Ca^{2+} wave, while samples from neurotypical individuals display a fast, large signal.

Conclusions: Therefore, IP_3R signaling appears to be at a node in a signaling pathway at which many forms of ASD are unified into a shared defective output that limits intracellular Ca^{2+} release. Defects in IP_3R signaling could contribute to many of the peripheral phenotypes reported in ASD where that signaling pathway plays key physiological roles, such as GI and immune dysfunctions. IP_3R signaling triggers the final step in axonal synaptic neurotransmitter vesicle release impacting the excitation/inhibition ratio. Importantly, it is also functionally coupled to mitochondrial VDAC channels, serving as the sole source of the rate-setting calcium flux that controls ATP production. Since the ER is also the key cellular stress sensor, it perhaps contributes as the environmental stressor to influence ASD pathogenesis. Together, this suggests ASD is potentially another organellar and channelopathy disease and establishes this IP_3R signal as a biomarker potentially useful as a clinical trial surrogate outcome measure or entry criterion, and in a screen for novel therapeutics. Most importantly, it will be clinically available as a risk detection tool from birth, maximizing access to early interventions. As a preliminary gauge of parental interest in obtaining this biomarker data for autism risk, at the 2024 TACA Annual Conference we offered to test a currently diagnosed child and younger sibling, once it is clinically available. The TACA conference attendees included >900 people, the majority being parents of children with ASD. Our assay was well-received overall, including 31 families who registered for our offer.

440.262 The Role of Camouflaging in Adult Autism Assessments

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Background: Camouflaging refers to when an autistic individual engages in strategies to compensate for or mask their autistic traits. As such, others (including possibly clinicians) may not notice ways they are autistic. Researchers and autistic individuals have both identified camouflaging as a potential reason for delayed or missed autism diagnoses (Milner et al., 2019), which may impact self-understanding, delay autistic community connections, and postpone access to support (Riccio et al., 2021). However, little is known about how clinicians think about camouflaging, whether they assess camouflaging behaviors, and ultimately how they use that information to make diagnostic decisions. A better understanding of camouflaging and how it is currently considered in adult autism assessments may ultimately help advance diagnostic practices and improve outcomes for autistic individuals.

Objectives: The present study sought to better understand the role of autistic camouflaging in adult autism evaluations and diagnostic decisions by (1) presenting survey information on how clinicians assess and consider camouflaging behaviors when conducting autism evaluations in adults, and (2) evaluating how autistic adults and diagnosing clinicians differ in their perceptions of autistic camouflaging.

Methods: Participants included 141 autistic adults ($M_{age} = 35.2$ years, 43.3% cisgender men, 66.7% white) recruited through Prolific and 41 diagnosing clinicians ($M_{age} = 34.9$ years, 81.1% cisgender women, 73.0% white) recruited through professional listservs and networks. Clinicians (licensed providers, as well as trainees, residents, and post-docs) were required to have experience diagnosing autism in adults. All participants completed an online survey broadly focused on adult autism assessments and perspectives about camouflaging.

Results: Most clinicians agreed that camouflaging impacts the diagnostic process (87.8%). The majority also reported they assess for camouflaging behaviors in adult autism assessments (73.2%) and discuss camouflaging during the assessment process (73.2%). Nearly 90% of clinicians indicated they discuss camouflaging during the feedback session. Most clinicians felt camouflaging has *not* prevented them from giving an autism diagnosis (60.0%). When comparing autistic adults and clinicians on their perspectives of camouflaging, independent samples *t*-tests revealed the autistic group felt more strongly that camouflaging is essential to both ask about during testing visits ($p = .005$) and discuss during feedback sessions ($p = .001$). There was also a significant group difference in response to the statement positing that camouflaging leads to mental health difficulties, with clinicians rating higher levels of agreement compared to autistic adults ($p = .004$). See Table 1 for a detailed breakdown of these perspectives and practices. A sample of open-ended responses from autistic participants about camouflaging and assessment are included in Table 2. Open-ended responses indicated a broad range of qualitative perspectives regarding definitions of camouflaging (often emphasizing the exhaustion and effort associated with masking), and suggestions for assessing camouflaging.

Conclusions: Both groups indicated they see camouflaging as an important factor in adult autism assessments. However, there were differences between autistic adults' and clinicians' responses, particularly regarding whether asking about camouflaging during evaluations is essential. Autistic open-ended responses provided unique suggestions for how camouflaging should be considered during assessments and future ways that might be accomplished.



440.263 The Trajectory of Diagnostic Rate and Traits of Autism Spectrum Disorder in Children Born Preterm

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Background: We reported that the diagnostic rate of autism spectrum disorder (ASD) in a high-survival Japanese cohort of children born very preterm (<32 weeks of gestation) was as very high as 21% in 2022 and autistic traits of them were similar to those in the children born full term in 2023. In the study, children at age 4-6 years old and their parents were assessed using the Autism Diagnostic Observation Schedule, 2nd edition (ADOS-2) and the Diagnostic and Statistical Manual of Mental Disorders, 5th edition (DSM-5). Many researchers have reported a high prevalence of ASD in preterm infants, but the mechanism and etiology of the disorder remain unclear.

Objectives: We tried to evaluate the trajectory of the diagnostic rate reassessing the children born very preterm and term at the age of 10-12 (fourth through sixth grade of elementary school). Autistic traits were also assessed and compared to the previous study.

Methods: The 77 children born before 32 weeks of gestation and 32 children with ASD (by DSM-5) born term in our previous study were eligible in the study. The children and their parents were recruited for the current follow-up study. Informed consent was obtained from the parents and children of 62 of the 77 in the preterm group and 24 of the 32 in the term group respectively. In addition to ADOS-2 and DSM-5, Autism Diagnostic Interview Revised (ADI-R) was administered in this study. For the trajectory of the diagnostic rate, "confirmed ASD" was defined if a child was diagnosed as both ASD positive in the DSM-5 criteria and autism in the ADOS-2 criteria as in our previous study. In the present study, the new diagnostic rate was considered confirmed when all three of DSM-5, ADOS-2 and ADI-R were positive. This study was approved by the ethics committee of the hospital.

Results: At present 43 parents in the preterm group and 14 in the control group have completed DSM-5 and ADI-R. In DSM-5, 20 and 13 have tested positive and in ADI-R, 9 and 10 have tested positive in the preterm and control group respectively. In our previous study, 20 of the 77 and 15 of the 32 children have tested positive in the preterm and control group respectively.

Conclusions: Currently, more children than in our previous study have tested positive for DSM-5 in the preterm group. More details regarding DSM-5, ADOS-2 and ADI-R will be reported in the day's presentation. We will discuss whether there is a relationship between the trajectory on diagnosis and autistic traits in the preterm group.

440.264 The Use of the Autism Diagnostic Observation Schedule, Second Edition (ADOS-2) with English-Spanish Bilingual Individuals in the United States

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Background: The Autism Diagnostic Observation Schedule, Second Edition (ADOS-2; Lord et al., 2006) is a semi-structured observation that is part of the gold standard battery for informing a clinical diagnosis of ASD (Falkmer et al., 2013). While the ADOS-2 has been translated into more than 20 languages (including Spanish) and validated with monolingual populations, no study has tested the reliability and validity of the ADOS-2 with bilingual individuals. Clinicians are often faced with decisions about which language to assess a bilingual individual in when they are exposed to two different languages, with no objective data to guide them. This is particularly important in diverse countries such as the United States, where Spanish is the most common language other than English (U.S. Census Bureau, 2022) and an estimated 1 in 4 children with autism are believed to be raised in a bilingual environment (Trelles & Castro, 2020).

Objectives: The goal of this study is to assess whether autism symptoms, including social affect and restricted and repetitive behaviors, differ depending on the language of the ADOS-2 administration.

Methods: A total of 86 community-referred English-Spanish bilingual participants with pre-existing autism diagnoses, or concerns about autism, were recruited across Southern California. Participants were all Latinx and mostly from low-income households (>80%). Participants ranged in age from 18 months to 45 years of age and varied in language abilities from no words to fluent sentences. Additional demographic information is included in Table 1. There are five ADOS-2 modules that vary in activities and coding schemes based on age and language abilities; all yield standardized comparison scores (CSS) that account for age and language and can be compared across modules. All participants were randomized to receive the ADOS-2 in Spanish or English first and to which of three English-Spanish bilingual clinicians administered each version. All participants completed both English and Spanish versions of the ADOS-2 across two visits. Most participants completed both administrations within four weeks. Participants chose where the assessment took place, which included a university clinic, their residence, or a community-based setting (e.g., park or library). Assessors were blind to the ADOS-2 scores of the previous administration. In addition to the ADOS-2, we completed cognitive testing and collected demographic information (e.g., sex and primary language spoken in the home). T-tests were used to compare the CSS means between the Spanish and English administrations.

Results: Based on pre-liminary findings, the data suggests there are no significant differences in autism symptom severity scores between the Spanish and the English administrations of ADOS-2 across all modules ($p > .05$; Table 2).

Conclusions: Results demonstrate a lack of differences in autism symptoms observed between Spanish and English administrations of the ADOS-2 with bilingual individuals. It is important, however, that providers continue to provide culturally sensitive care to families across the globe. Next steps include additional analyses focused on testing of reliability while accounting for critical factors like consensus autism diagnosis, IQ and language dominance, which will be included in the final presentation.



440.265 The Utility of Home Video Analysis in New Perspectives of Regression

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Background:

Research regarding skills loss in children (developmental regression) is predominantly understood in condition-specific terms and varies in definitions, measures, and standard diagnostic criteria. The resulting variation and lack of clarity for assessment and intervention has prompted research to consider skills-based perspectives that incorporate transdiagnostic approaches to capturing regression. Alternatively, regression can be considered as a symptom or sign in order to identify areas of loss and implement supports while a diagnosis is sought. Appropriate diagnostic tools will therefore need to be dimensional, and this approach can be applied to home video analysis. Clinical use of this tool is limited to date, awaiting research to understand how to optimise video submissions and their yield.

Objectives:

To apply a dimension lens to home videos in order to understand their utility in capturing relevant information for all developmental domains and identifying optimal video types for maximum yield.

Methods:

A selection of 60 home videos of six children (five males) with reported regression were categorised according to video characteristics including duration, featured interactions on screen, context, and activity (indoor/outdoor). Five participants were children with a diagnosis of autism. Following inter-rater reliability calculation and discrepancy resolution, a novel system for relevant developmental domains was applied using a publicly available annotation software. Instances of observed behaviour and failed attempts, as well as absence of responses to prompts were captured to identify opportunities across videos. Qualitative information was recorded through comments about the degree of utility of each video.

Results:

The reported age of regression across the sample spanned from 13 – 36 months. Child age in videos ranged from 0 – 40 months, with videos available before, during, and after reported regression in all participants with ages supplied. All videos in the sample contained observations relevant to the code system, with higher total and average yields in videos of play contexts and those featuring interaction with the filmer. All domains of interest were detected in the sample, however functional and fine motor skills were observed at lower frequencies. More than half of the videos in the sample allowed observations of attention skills (88%), gross motor skills (74%), social skills (66%), and speech/communication skills (62%). Play context videos and videos featuring an interaction with the filmer displayed the highest proportion of relevant observations. Qualitative analysis revealed rich information regarding target developmental domains, engagement, and curiosity in play contexts and a high degree of information in videos featuring instructions for the child from the filmer.

Conclusions:

Findings support the use of home video analysis for the early identification and clinical assessment of developmental regression. Developmental domains that may require alternate tools or specific video recorded tasks, like fine motor skills, were also identified. Video characteristic comparisons can guide video submission protocols that maximise observations, streamline analyses, and lead to standardised approaches for home video analysis. These results are consistent with past research that found home videos to be useful in detecting developmental regression and extend the potential of this tool for new research, training, and clinical purposes.

440.266 Toward New Strategies for ASD Identification in China: Early Results of Psychometric Validation of the Screening Tool for Autism in Toddlers –China (STAT-C)

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Background: Prevalence of autism spectrum disorder (ASD) is approximately 1% among school-age children in China (Sun et al. 2019), a country with a population of 1.4 billion with 9-11 million babies born annually. While the Autism Diagnostic Observation Schedule (ADOS-2) and Autism Diagnostic Interview-Revised (ADI-R) have been the most widely used standardized tools for autism-focused assessment worldwide, they are not commonly used in China due to time requirements for administration and scoring, high cost of materials and training, and an absence of translation in simplified Chinese. In China, early identification of autism relies on clinician and caregiver completed rating scales (Chu et al. 2022) and expert understanding of DSM-5 criteria (Zhou et al. 2022). The Screening Tool for Toddlers- China (STAT-C) was translated from the original English-language version and assesses key social and communicative behaviors associated with ASD across a 20-minute interactive administration. The algorithm's cutoff score is used to evaluate likelihood for autism presence. Validation of the STAT-C is needed to support its use in China for early identification of ASD.

Objectives: Focus of this work is to determine the appropriate cutoff score for use with Chinese two-year-olds and to examine the psychometric properties of STAT-C.

Methods: The study was conducted across 10 teaching hospitals in China. The validation sample was comprised of 764 children between ages 24 and 36 months, without known genetic/metabolic differences or serious sensory/motor impairment. Providers administering the STAT-C received training and met reliability requirements with certified STAT trainers and had professional experience conducting psychological assessments. The study visit included two parts: Part 1 included STAT-C administration led by a provider certified in the STAT-C. Part 2 included a standard ASD-focused assessment using the Griffiths Mental Development Scale-Chinese (GMDS-C), M-CHAT, CARS-2 and DSM-5 criteria. Part 2 was led by a second provider blinded to results of the STAT-C. Test-retest reliability was conducted on a subset of 30 children with an average time of 17 days between administrations.

Results: Receiver operating characteristic (ROC) analysis was used to test the optimal cutoff score of STAT-C to differentiate the ASD and DD groups in the Chinese sample. Using a cutoff score of >2.0 , analyses showed a sensitivity of autism presence of .80, specificity of .83, and positive- and negative predictive value (PPV; NPV) of .89 and .73 respectively. When analyzed using a cutoff score of equal or greater to 2.0 (cutoff used in the original STAT and T-STAT), sensitivity rose to .85 and specificity decreased to .72, with PPV of .83 and NPV of .75. Test-retest reliability showed a Pearson Correlation Coefficient of 0.77.

Conclusions: Early analyses suggest that the STAT-C possesses acceptable psychometric properties and that 2.0 serves as an appropriate cutoff score to mark likelihood of autism presence. The STAT-C may be a viable option for Chinese providers seeking a standardized instrument to aid in time-sensitive early identification of ASD. Future work will further examine the validation sample and evaluate feedback from Chinese providers on collective perspective of the use of the STAT-C within clinical practice.

**440.267** Towards Promoting Therapeutic Conversation with Autistic Adolescents through Interacting with Automatic and Teleoperated Virtual Robots

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Background: Humanoid robots have gained recognition for their potential to support individuals with autism spectrum disorder (ASD) by providing emotional stability and reducing hesitation in social interactions (Warren et al., 2015; Kumazaki et al., 2018). Recent advances involve two virtual humanoid robots generated through computer graphics (CG), teleoperated by individuals with ASD, which facilitate one-to-one communication training (Kumazaki et al., 2022). In human-robot interaction (HRI) research, it has also been suggested that controlling two robots, one as proxy of a user and the other as a supportive side participant, can help the user self-support their dialogue (Nozawa et al., 2024).

Objectives: This report reviews the author's developments in both physical and virtual robots and discusses the challenges of combining robotic virtual conferencing and automatic dialogue systems to create a more supportive dialogue space.

Methods: The below four systems were developed and reviewed its effects: i) A virtual robotic conferencing system was developed, allowing users to communicate using 3D CG avatars of humanoid robots as their proxies (Yoshikawa et al., 2023). ii) The system was updated with more human-like avatars, aimed at university counseling, where the counselee could select preferred avatars for both him/herself and the counselor. iii) A telecommunication system was created with two physical robot avatars, enabling an operator to use one as a proxy and the other as a supportive side-participant (Nozawa et al., 2024). iv) A chatbot system was developed within popular Japanese messaging apps, providing users with opportunities for casual conversation and encouraging self-disclosure over time.

Results: (i) The virtual conferencing system was implemented in a group-based online training program for individuals with ASD in mock job interviews, improving both verbal and non-verbal communication skills. ii) A user study comparing student counseling scenarios found that the avatar-based system outperformed Zoom in certain aspects, especially in terms of ease of self-disclosure. iii) In an experimental conversation scenario involving rude questions, the dual-robot system helped reduce the operator's discomfort, demonstrating its potential to mitigate stressful social interactions. iv) A user study on the chatbot system showed that gradually deepening conversations over several days decrease reactance to being asked for self-disclosure, indicating the effectiveness of prolonged interaction.

Conclusions: The results from i) and ii) highlight the potential of virtual robots to foster more effective therapeutic conversations between individuals with ASD and their therapists. However, these technologies alone may not be sufficient for the deep self-disclosure required for intensive therapy. The findings from iii) suggest that incorporating a supportive agent in the virtual robot system could enhance the user's conversational experience. The success of iv) suggests that automatic agents collecting disclosures from users and assisting in virtual counseling sessions could be developed. Together, these results indicate a promising direction for creating multi-person dialogue spaces, where parts of virtual robots act as automatic, supportive side participants, ultimately enabling more effective small-group therapeutic sessions for individuals with ASD.



440.268 Toy Selection in the Brief Observation of Symptoms of Autism (BOSA): Parental Choices and Associations with Functional Play and Imagination Scores

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Background: Brief Observation of Symptoms of Autism (BOSA) is a brief, direct assessment of autism symptoms by clinicians or parents (Dow et al., 2021). Scoring considers creative use of toys, yet toy selection varies based on clinician/parent preference. How toy selections impact scores are unknown.

Objectives: Determine whether 1) toy selection (TS) correlates to BOSA scoring of C1: Functional Play with Objects and C2: Imagination/Creativity; and 2) ASD versus non-ASD groups differ on TS, BOSA C1, and BOSA C2.

Methods: Toddlers at 24-months-old (n=148) and 36-months-old (n=152) participating in a longitudinal, prospective study of ASD (including low-birthweight infants, with an ASD-sibling, or without known factors increasing autism likelihood) were classified as ASD (n=40), neurotypical (NT; n=112), or with non-ASD atypical development (ATYP; n=36). Our team classified BOSA toy options as having a creativity score of 1 (creative play more likely) or 0 (functional play more likely) and summed each parent-child dyad's selection of up to 6 toys (TS score: range 0-5) (Table 1). We used linear mixed models to assess the impact of TS and age on C1 and C2, allowing for repeat measures. We then modeled effects of diagnosis and age on TS, BOSA C1, and BOSA C2 (Table 2). Pairwise comparisons were conducted to evaluate group differences.

Results: ANOVA of Model 1 revealed a main effect of TS (higher TS led to lower BOSA C1 scores, $p < .001$) and a marginally significant interaction (negative relationship of TS to BOSA C1 stronger at 24-months, $p = .051$). ANOVA of Model 2 revealed a main effect of TS (higher TS led to lower BOSA C2 scores, $p < .001$) and no significant interaction. ANOVA of Model 3 showed main effects of diagnosis (ASD significantly lower TS than ATP and NT, $p < .05$) and age (significantly lower scores at 24-months, $p < .001$) but no significant interaction. ANOVA of Model 4 showed main effects of age (24-months significantly higher C1 score, $p < .001$), diagnosis (ASD significantly higher C1 score than ATP and NT, $p < .001$), and an interaction (such that NT children were the only ones who exhibited no significant age effect between visits, $p > .05$). ANOVA of Model 5 showed main effects of diagnosis (ASD significantly higher than ATP and NT) and age (24-months significantly higher than 36-mo) and a significant interaction (ASD significantly higher than ATYP and NT at 24-months but not significantly different from ATYP at 36-months, and NT significantly lower than ATP at 36-months).

Conclusions: Results show toddlers with access to creative toys have lower (better) BOSA C1 and C2 scores, especially at 24 months. Parents of ASD children selected fewer creative toys compared to neurotypical and atypical peers even at 24 months (typically before diagnostic status was ascertained). This difference lessened by 36 months, suggesting that toy selection may be less critical for older children. Despite equal access to creative toys at 36 months, ASD children still exhibited lower scores than neurotypical peers, in line with expectations that creative toys may not foster imaginative play for ASD toddlers as effectively as for their neurotypical counterparts.



440.269 A Comparison of Diagnostic Outcomes of Autism between DSM-5 and ICD-10 in Very Young Children

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Background:

In anticipation of and shortly following the publication of the American Psychiatric Association's (APA) most recent edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; APA, 2013), concerns were raised over the sensitivity of the new criteria for autism diagnosis, specifically regarding young children (Barton et al., 2013; King et al., 2014; Kulage et al., 2014). Comparing prospective application of the DSM-5 to alternate diagnostic criteria, such as the International Classification of Diseases – 10th Revision (ICD-10), may allow us to better understand how diagnostic criteria identify autism in young children.

Objectives:

We aim to examine differences in DSM-5 and the ICD-10 classification of autism and related diagnoses in young children by evaluating participant characteristics and autism severity scores when DSM-5 and ICD-10 disagreement occurs.

Methods:

Data was analyzed for 353 children (239 males) aged 12-60 months ($M=20.97$, $SD=6.62$) from a larger study investigating autism screening in young children. As part of a comprehensive autism evaluation, children were administered the Autism Diagnostic Observation Schedule–2 (ADOS-2; Lord, 2012) which generates Calibrated Severity Scores (CSS) that indicate intensity of autistic characteristics, in addition to assessments of cognitive ability and parent report of adaptive functioning, autism symptoms, developmental history, and family history. Diagnostic labels of Childhood Autism, Atypical Autism, and Asperger's from the ICD-10, and the diagnostic label of Autism Spectrum Disorder from the DSM-5 were considered indicative of autism, whereas all other diagnostic labels were considered to be non-autism conditions.

Results:

McNemar's test revealed significant proportional differences ($p<.001$) between ICD-10 and DSM-5 agreement of autism ($n=108$, 30.6% of cases), ICD-10-only indication of autism ($n=12$, 3.4%), DSM-5-only indication of autism ($n=0$, 0%), and ICD-10 and DSM-5 agreement of non-autism ($n=233$, 66%). In all cases, when disagreement occurred between ICD-10 and DSM-5, ICD-10 criteria indicated autism (atypical autism, $n=7$; childhood autism, $n=5$) and DSM-5 criteria did not indicate autism.

Participant characteristics for agreement and disagreement of both criteria are located in Table 1. For individuals with ICD-10 and DSM-5 disagreement on indication of autism, 91.7% ($n=11$) received the ADOS Toddler Module. In addition, for those in the Disagree group, the median total CSS score was 6 ($M=6.45$, $SD=1.63$), indicative of autism and significantly different from groups with agreement on autism and with disagreement on autism ($p<.001$).

Conclusions:

The ICD-10 and the DSM-5 were concordant in classifying most children with autism or non-autism. However, a small number of participants did not meet DSM-5 autism criteria but did meet ICD-10 criteria, with no cases showing the reverse, suggesting 'narrower' criteria in the DSM-5 compared to the ICD-10, particularly for very young children. This study has implications for prior rates of autism diagnoses and contributes to a larger conversation regarding guidelines for autism diagnosis. This topic is especially timely as researchers and practitioners call for strategies to improve early diagnosis of autism in order to support autistic children's access to autism-specific early intervention.



440.270 Use of the Autism Behavior Inventory Among Students with Autism Spectrum Disorder: Findings from a Longitudinal Cohort Study

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Background: Due to the limitations of existing scales to measure change in core symptoms of autism spectrum disorder (ASD), the novel measure of Autism Behavior Inventory (ABI) was recently developed (in 2017) both in full (ABI-F) and short (ABI-S) forms to assess change in core and associated ASD symptoms in children and adults with ASD. Developed as a caregiver-based assessment for clinical trials and practice, to our knowledge, the ABI has not previously been used in the context of specialized ASD schools nor educational interventions where short-term changes in ASD symptoms are important but difficult to measure. Therefore, we introduced the short form of the survey to an existing cohort study measuring ASD outcomes at a specialized ASD school.

Objectives: To measure any significant change in the average parent and teacher-reported ABI-S scores over time for children, adolescents, and adults with ASD.

Methods: This one-year longitudinal cohort study included 24 participants (aged 10-21 years) with ASD from a specialized school and was part of an existing cohort study that was already in effect at the school for five years when the ABI-S was introduced. Evaluations of ABI-S were completed by parents and teachers every 3 months. Repeated measures analysis using mixed-effects models was used to determine significant changes in the mean ABI-S scores across the timepoints. Parent and teacher-reported measures were analyzed separately and the time a participant had been in the broader cohort study was adjusted for.

Results: The mean age for the participants at baseline was 17.1 ± 3.2 years, with males comprising of 92% of the population. On average, there were statistically significant decreases (indicating improvement in symptoms) in the mean parent-reported ABI-S scores over time for all participants with ASD at the school ($b=-0.92$, $p=0.04$). Compared to baseline, parent-reported ABI-S score decreased by 3.6 points after 5 survey timepoints, which corresponds to approximately 1.25 years ($p=0.053$). The average teacher-reported ABI-S scores did not change over time ($p=0.5$).

Conclusions: The improvement in parent-reported ABI-S scores but not in teacher-reported scores is an interesting finding. One possible explanation is that when reporting change, teachers may have viewed autism-associated behaviors through a more precise lens and may have compared them to other students in the classroom, resulting in moderate ratings. From the parents' perspective, the specialized learning environment in the school may have benefited the students, which in turn could have contributed to a less stressful and challenging environment at home and led to better ratings of autism-associated behaviors. Nevertheless, this observed difference in parent ratings (but not teacher ratings) in a relatively short time span suggests ABI-S to be a good caregiver-based assessment that is perhaps more suited to clinical trials (indeed the purpose for which it was developed) rather than for school environments, where change may be more slow and therefore more difficult or elusive to measure. Future studies should have longer term follow-up and larger sample sizes. They could also focus on determining more precise measures of change in outcomes in specialized schools for ASD.

440.271 A Brief Observation to Screen for Autism in Toddlers Based on Socio-Communicative Skills*F. Journal, Department of Psychiatry, University of Geneva, Geneva, Geneva, Switzerland*

Background: Prevalence of Autism Spectrum Disorder (ASD) is estimated at 1 in 36 children in USA. Despite the need to provide diagnoses as early as possible to promote good development of children through appropriate interventions, waiting times before obtaining a diagnosis are long. In this regard, effective and easy-to-administer screening tools in primary care settings are essential, enabling pediatricians to identify children displaying features of ASD earlier, facilitating access to diagnostic and interventions services. Early social skills are pivotal in cognitive and developmental outcomes in early ASD and are the primary target of many early intervention models improving long-term cognitive functioning. The Early Social Communication Scales (ESCS) directly measures early milestones in social and communication development that are part of routine pediatric examination.

Objectives: This study explores fine-grained measures of early socio-communicative behaviors as potential markers for ASD using the Early Social Communication Scales (ESCS) on children under 3 years of age. The aim is to create a tool that is readable and easy to implement in a consultation, based on machine learning techniques.

Methods: This retrospective study analyzed data from 113 children with ASD and 59 with typical development (TD), aged 2.23 (SD=0.51).

Twenty-three ESCS variables were used to predict ASD diagnosis and cognitive developmental patterns. The C5.0 decision tree algorithm was used to classify ASD versus TD. K-fold cross-validation, permutation testing, and undersampling were used for model validation.

Results: The decision tree for ASD diagnosis versus TD achieved 94.77% accuracy, 96.46% sensitivity and 91.52% specificity. Nine ESCS variables were significant in distinguishing ASD from TD. Two variables were found to classify ASD from TD children with good specificity: whether the child initiates ball passes (ISI Initiates Turn Taking) and uses pointing to request objects or actions (IBR Points) but identifying only half the ASD children in our sample. A second group of variables, related to joint attention (IJA Alternates, ISI Initiates Song/Tickle, IJA Eye contact, IJA Points and RJA Following proximal points) improved the model's specificity, achieving over 90% accuracy in classifying TD children. Lastly, response to social interaction behaviors (RSI appeal and RSI Response to invitation) enhance the model's sensitivity.

Conclusions: We provide a promising tool focusing on early socio-communicative behaviors to guide pediatricians through autism screening.

Based only on 9 behaviors to be assessed, the model created is easy for pediatricians to incorporate into their routine, making it easier for them to refer children to specialist services if necessary.

**440.272** Using Low-Level Movement Dynamics during Drawing and Handwriting Tasks to Estimate Nonverbal Cognitive Ability in Minimally Verbal Autism

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Background: Difficulty in drawing/writing often reflects fine motor dysfunction in autism spectrum disorder (ASD) associated with cognitive deficits (Green et al, 2016). Given the challenges conducting cognitive assessments in the minimally verbal (MV) ASD population, we developed a method for estimating cognitive ability from movement dynamics in hand drawing and writing tasks, based on the hypothesis that complexity of movement dynamics is an indicator of nonverbal cognitive functioning in MV ASD.

Objectives: Use movement complexity features from shape drawing and handwriting tasks to estimate nonverbal cognitive ability in a population of MV ASD adults.

Methods: Data from 20 MV ASD participants (age 19-32; 12M, 8F) and 18 neurotypical controls (age 19-32; 10M, 9F) were analyzed. MV status was determination as: 1) non-verbal/non-speaking; 2) producing <30 words spontaneously during language sample; and/or 3) Expressive Vocabulary Test (EVT-3) scores ≤1st percentile. Tasks were performed on a Surface Tablet. Drawings consisted of the first 17 shapes from the Beery-Buktenica Test of Visual-Motor Integration 6th Edition (VMI-6), and handwriting consisted of 7 animal words. Time series x,y acceleration values were extracted and segmented into multiple 200ms frames, from which complexity feature vectors were extracted (Talkar et al, 2024; Williamson et al, 2021). Summary statistics of drawing and handwriting were computed by averaging feature vectors across all drawing and handwriting frames per participant. Nonverbal IQ (NVIQ) raw scores, assessed using the Stanford-Binet Intelligence Scales, 5th Edition, Abbreviated IQ, were used as the primary measure of nonverbal cognitive ability, with VMI-6 raw scores from a paper-and-pencil version of the assessment as a secondary measure. Linear regression was used to estimate NVIQ from summary statistics using leave-one-out cross-validation over the pooled data set of 38 participants. Prior to linear regression, principal component (PC) analysis was used to obtain reduced dimensionality, with the number of PCs selected to explain 99% of the variance. Regression modeling was done using three feature sets: 1) shape drawing (4 PCs); 2) handwriting (4 PCs); 3) shape drawing and handwriting (8 PCs). This was done to investigate the utility and complementarity of the motor tasks for estimating nonverbal cognitive ability.

Results: Within-group Pearson correlations of predicted versus measured NVIQ were computed for the ASD and control groups. Statistically significant correlations were not found for features sets (1) or (2). However, feature set (3) resulted in strong, significant correlations of $r=0.58$ ($p=0.015$) and $r=0.62$ ($p=.006$) for the ASD and control groups, respectively. In addition, by summing z-scored NVIQ and VMI-6 into a single outcome measure, stronger correlations were obtained of $r=0.61$ ($p=.004$) and $r=0.62$ ($p=.006$) for ASDs and controls, respectively (Figure 1).

Conclusions: A method was developed for estimating nonverbal cognitive ability in MV ASD adults and controls, based on local-time analysis of acceleration complexity in shape drawing and handwriting tasks. The analysis did not require holistic measurements of drawing and writing outputs or qualitative judgments. It relied only on local-time acceleration dynamics. This method may enable an easy and automated assessment tool for nonverbal cognitive ability in both MV ASD and neurotypical adults.



440.273 Using the Brief Observation of Autism Symptoms (BOSA) to Evaluate Autism Symptoms - Results from the Autism Biomarkers Consortium for Clinical Trials (ABC-CT)

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Background:

During the COVID-19 pandemic, social distancing requirements forced research and clinical groups to use novel methods for evaluating autism symptoms. As Autism Diagnostic Observation Schedule (ADOS-2) scores are considered invalid if administered while wearing personal-protective equipment, alternate measures were often utilized. The Brief Observation of Symptoms of Autism (BOSA) is an assessment that provides a standardized, naturalistic social context via a series of parent-child activities and observed by the clinician remotely (Dow et al., 2021). Observed behaviors are interpreted within the framework of ADOS-2 codes, allowing for consistent measurement of autism symptoms. Using a validation sample of 307 participants, BOSA diagnostic score cutoffs were determined, which yielded sensitivity and specificity rates similar to the ADOS-2 (Dow et al., 2021). Replication in new samples is crucial to inform the interpretation of this novel but widely-used measure. The longitudinal follow-up phase of the Autism Biomarkers Consortium for Clinical Trials (ABC-CT) provided an ideal opportunity to examine the performance of the BOSA in a large sample of well-characterized children with autism along with a neurotypical comparison group.

Objectives:

1. Evaluate the sensitivity and specificity of BOSA diagnostic categorization compared with clinical best estimate DSM-5 diagnosis and standardized diagnostic assessment (Childhood Autism Rating Scale-2 [CARS-2]).
2. Examine the association between BOSA category and clinical characteristics (verbal/non-verbal cognition, internalizing/externalizing behavior).

Methods:

The ABC-CT enrolled children with autism or neurotypical development across five sites (McPartland et al., 2020). See table 1 for sample characterization. The first three study timepoints (prior to the COVID-19 pandemic) included direct assessment of autism symptoms (ADOS-2) alongside other clinical and biomarker measures. A fourth longitudinal timepoint (T4) occurred during the COVID-19 pandemic (1-5 years after initial study participation), during which participants completed the BOSA. The CARS-2 was completed based on the totality of parent report and direct assessment/observational information at T4. Sensitivity and specificity were evaluated by comparing the BOSA diagnostic categorization to DSM-5 diagnosis confirmed at the earlier study timepoints and T4 CARS-2 categorization. *ANOVAs* were used to compare clinical characteristics between BOSA diagnostic groups.

Results:

BOSA categorization yielded high sensitivity (86-100%) and specificity (79%-96%) with reference to DSM-5 diagnosis, consistent with the Dow, et al. (2021) validation sample (Table 2). With reference to CARS-2 categorization, sensitivity was high (87%-100%) and specificity was moderate-high (61%-92%). BOSA scores were independent of verbal and non-verbal IQ score but showed strong associations with internalizing and externalizing behavior as measured with the BASC ($p < .001$).

Conclusions:

While our sensitivity and specificity may have been increased due to the fact that our sample had already undergone research diagnosis confirmation, it is nonetheless encouraging that we replicated the initial BOSA validation results and BOSA diagnostic categories were unrelated to verbal or non-verbal cognition. Further research is needed to examine the association between BOSA category and internalizing/externalizing behavior, and to determine whether "false positives" in the neurotypical group may be due in part to the presence of mental health concerns (e.g. anxiety, depression) that may have newly manifest as participants aged into adolescence between study timepoints.

**440.275** Virtual Autism Assessment Measure for Underserved Communities

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Background: Telehealth assessment for autism could facilitate early identification and intervention, especially within underserved communities as they face increased barriers to assessment and care (Maenner et al., 2020; Shenouda et al., 2022). Preliminary data suggests that the Brief Observation of Symptoms of Autism (BOSA) is a promising virtual autism screener that has good convergence validity with the Autism Diagnostic Observation Schedule (ADOS-2). In a recent study, BOSA sensitivity and specificity ranged from .86-.98 and .7-1.0, respectively (Dow et al., 2022). The BOSA consists of a 12-to-14-minute video recording of a natural social interaction between the individual and examiner. The recording is then rated by a clinician trained in the ADOS-2 (Dow et al., 2022; Stroupková et al., 2024).

Objectives: The purpose of the study was to evaluate the psychometric properties of the BOSA with a Spanish-speaking sample.

Methods: Spanish BOSA recordings were collected from 70 Hispanic American individuals living in Southern California, ages ranging from 18-months to 45-years of age. As part of a larger study, participants were also assessed with a caregiver developmental interview and through direct observation from an ADOS-2 administration. From this sample, preliminary analyses were run for 34 BOSA recordings collected from 16 minimally verbal (12 ASD, 5 females) and 17 verbally fluent individuals (14 ASD, 5 females). A Receiver operator characteristic (ROC) curve was computed for the BOSA algorithm total to determine how well the measure differentiates between ASD and nonspectrum groups. Interrater reliability was examined for 10% of these videos (as done by Dow et al., 2022).

Results: The area under the curve was .73 (95% CI [.54, .93]) and significant ($p = .02$), indicating acceptable discrimination between groups. At the optimal threshold, the sensitivity was 0.72, while the specificity was .56. Interrater reliability was assessed using Cohen's Kappa, values ranged from 0.41 to 0.81, indicating fair to strong agreement between raters. Average Kappa across all coding sessions was 0.65.

Conclusions: While preliminary, the BOSA holds clinical promise in increasing accessibility to autism assessment as it can be delivered by several people (e.g., teacher, caregiver, or paraprofessional) across different settings. This flexibility promotes early identification and intervention, particularly in underserved communities that encounter greater obstacles to obtaining timely evaluations and care (Maenner et al., 2020; Shenouda et al., 2022). Of note, given its specificity, the BOSA works well as a screener but not as a diagnostic measure. Currently, the BOSA is also limited by the requirement that its rating be done by an ADOS-2 trained clinician. Replication of analyses with our entire sample will be done by the time of presentation.

440.276 Shape Drawing As a Potential Screening Technique for Children with Autism Spectrum Disorder

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Background:

Autism spectrum disorder (ASD) is often associated with early developmental delays in fine motor skills. They often show deficits in writing and drawing, which are important skills for their social adaptability. ASD is often associated with early developmental delays in fine motor skills. Machine learning technologies have rapidly developed in recent years. Among these, neural network technology has had a significant impact in various fields, such as movie recognition. Given that machine learning can be a powerful technique for predictive models learning from movement data, it is possible to objectively evaluate the drawing process and product characteristics using movies and machine learning. We developed a new approach to ASD screening based on the task of drawing an equilateral triangle and its evaluation using machine learning. Furthermore, to deepen our interpretation of the results obtained from drawing triangles, and considering the difficulties in executive function and specificity in visual working memory in children with ASD, we proposed the idea of assessing the drawing of inverted equilateral triangles, squares, and suns. In this study, we conducted an experiment in which almost all eligible residents (approximately 99%) in a chosen city could participate.

Objectives:

The objective of this study was to assess the effectiveness of evaluating drawings of an equilateral triangle, an inverted equilateral triangle, a square, and a sun using machine learning for ASD screening.

Methods:

Forty-three males and 36 females participated in the study. The participants were asked to draw each shape in the following order: an equilateral triangle, an inverted equilateral triangle, a square, and a sun. The model for classifying whether participants were suspected of having ASD was developed using a support vector machine (SVM) algorithm with a radial basis function kernel, utilizing 16 explanatory variables. A 16-inch LCD pen tablet was used to acquire data on hand-finger fine motor activity while the participants were drawing each shape. To estimate eye movements while drawing each shape, facial images were acquired using a webcam placed on top of an LCD pen tablet. From these data, we identified the explanatory variables used to model the SVM.

Results:

For each shape, a model of SVM could be created with an accuracy, sensitivity, and specificity all above 80%. Furthermore, combining four classification models yielded a greater accuracy and specificity (above 90%) than individual classifications. There were significant relationships between the probability output of the SVM classification model and total SRS score.

Conclusions:

These results demonstrate the effectiveness of assessing shape characteristics using machine learning for ASD screening. Future studies with a wider variety of shapes are warranted to further establish the potential efficacy of using drawing skills to screen for ASD.

440.277 Intervention Using Android Robot for Individuals with Autism Spectrum Disorders

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Background: Self-disclosure is the process by which people reveal personal information about themselves to others and is important in all types and stages of social relationships. Reciprocity via effective self-disclosure can lead to positive outcomes in initial interactions and promote further disclosure and relationship building. Individuals with ASD sometimes hesitate to disclose information to others due to challenges in understanding such interchanges or recognizing the potential value in relational reciprocity, as well as differences in social motivation. An android robot (Figure 1) is a humanoid robot with an appearance and movements resembling those of an actual human. It can exhibit a variety of facial expressions during speech and provide subtle nonverbal cues. It is very similar to human but, since it is a robot, it is still much simpler than humans. There is increasing anecdotal evidence for the fact that individuals with ASD may have unique opportunities to use android robots to assist them. Given the affinity between android robot and individuals with ASD, there is a possibility that interview by android robots in place of human interviewers can result in a higher degree of task engagement for individuals with ASD by reducing their social anxiety and helping their imagination and creativity. Given these factors, it is possible that interactions with android robots are linked to promoting self-disclosure by these individuals.

Objectives: The objective of this study was to investigate whether interview by android robot can prompt self-disclosure for individuals with ASD.

Methods: 21 young adults with ASD (Male: 17. Female 4: 21.3 ± 5.1) participated in the study. We compared the difference in disclosure statements and subjective emotion in interview setting by an android robot and a human interviewer. In addition, we assessed the subjective emotions in interview setting. Our quantitative data suggested that interview by android robot promoted more self-disclosure, especially about the negative topic compared to interview by a human interviewer. In addition, the level of participant embarrassment in response to addressing by the android robot seemed to be lower compared to that in the human interviewer condition.

Results: All participants completed the trial procedures without technological challenges or distress that could lead to session termination. Our quantitative data suggested that interview by android robot promoted more self-disclosure, especially about the negative topic compared to interview by a human interviewer and that written on test paper. In addition, the level of participant embarrassment in response to addressing by the android robot seemed to be lower compared to that in the human interviewer condition.

Conclusions: In the assessment and support for individuals with ASD, eliciting self-disclosure is a pressing issue. It is hoped that the appropriate use of robots will lead to a better understanding and support for their application.



440.278 The Psychometric Qualities of the a-Sleep

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Background:

Sleep disturbances are common among adults with ASD, affecting 50-80% (Carmassi et al., 2019). These issues worsen autistic behaviors, increase anxiety, and contribute to emotional and behavioral difficulties. Sleep problems are the strongest predictor of lower quality of life in individuals with ASD (Deserno et al., 2019). The A-Sleep questionnaire (80 items) was designed to assess sleep problems specific to adults with ASD, based on literature and input from ASD professionals and individuals with ASD.

Objectives:

To evaluate the psychometric properties of the A-Sleep questionnaire.

Methods:

Retrospective data were collected from an ASD diagnostic process at a mental health institution. Self-report questionnaires used included the A-Sleep, BRIEF-A (for divergent validity), HSDQ (for convergent validity), M-ASD (for construct validity), and AQ-10 (to screen for ASD traits in the control group).

The study involved 177 adults divided into three groups: a clinical group ($n = 122$), consisting of those diagnosed with ASD ($n = 68$) and those without ASD ($n = 54$), and a control group ($n = 55$) recruited from the general population via social media. Control group exclusion criteria included self-reported ASD or an AQ-10 score above 5.

Reliability was assessed with Cronbach's alpha, and test-retest reliability was evaluated with Pearson's correlation. Convergent and divergent validity were also measured using Pearson's correlation, and group differences in A-Sleep scores were analyzed using one-way ANOVA. Factor analysis was used to refine the questionnaire.

Results:

The A-Sleep demonstrated excellent internal consistency (Cronbach's $\alpha = .914$) and strong test-retest reliability ($r = .89$, $n = 45$, $p < .001$).

Construct validity was supported by a moderate correlation with the M-ASD ($r = .48$, 95% BHI = .33-.60). Significant differences in A-Sleep scores were found between groups, with the ASD group reporting the highest sleep problems, followed by the non-ASD clinical group and the control group (ANOVA, $p < .001$, $\eta^2 = .282$).

Strong convergent validity was observed with a high correlation to the HSDQ ($r = .88$, 95% BHI = .83-.92), and weaker correlations with the BRIEF-A scales supported divergent validity. Factor analysis in the clinical group ($n = 99$) explained 45% of the variance, refining the A-Sleep into a 30-item version, the A-Sleep-R. The four identified factors were: insomnia (8 items, $\alpha = .835$), late sleeping (6 items, $\alpha = .829$), sleep quantity and consequences (10 items, $\alpha = .839$), and sleep-related anxiety (6 items, $\alpha = .844$).

Conclusions:

The A-Sleep is a reliable and valid self-report tool for assessing sleep problems in adults with ASD, with excellent internal consistency, strong test-retest reliability, and solid convergent and divergent validity. It effectively differentiated clinical and control groups, and the factor analysis led to the development of a more efficient 30-item version, the A-Sleep-R. This refined tool is suitable for use in both research and clinical practice to assess sleep disturbances in adults with ASD.

440.279 Psychometric Properties of the M-ASD Questionnaire

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Background:

Autism spectrum disorder (ASD) in adults, particularly in females, is often under-recognized due to subtler manifestations, such as less pronounced social-communication difficulties and repetitive behaviors (APA, 2022; Hull et al., 2020). Timely identification of ASD can lead to improved long-term outcomes, prevention of secondary issues, reduced family stress, and lower societal costs (Garcia-Primo et al., 2014). The M-ASD questionnaire, a Dutch 50-item screening tool, was developed to better capture these more elusive presentations of ASD (Grondhuis et al., 2020).

Objectives:

To validate the M-ASD questionnaire in both a clinical setting and a control group.

Methods:

Retrospective diagnostic data were analyzed from 1260 adults suspected of having ASD who were referred to a general mental healthcare institution. Participants underwent comprehensive ASD assessments, which included the M-ASD, AQ-50, and BRIEF-A screening questionnaires. Of these, 63% received an ASD diagnosis (62% women). A subgroup of 39 participants was retested with the M-ASD within 2–8 weeks. Additionally, 181 adults from the general population (84% women) completed the M-ASD and AQ-10. Internal consistency of the M-ASD was evaluated using Cronbach's α , while construct validity was assessed via Pearson's r and T-tests. Criterion validity was tested using ROC analysis (sensitivity, specificity, PPV, NPV), and test-retest reliability was determined by Pearson's r .

Results:

The M-ASD showed excellent internal consistency (Cronbach's $\alpha = .955$) and strong test-retest reliability ($r = .924$, 95% CI [.859, .960]). Convergent validity was supported by a significant correlation with AQ-50 ($r = .760$, $p < .001$, 95% CI [.736, .782]), while divergent validity was indicated by weaker correlations with the BRIEF-A subscales Organization of Materials ($r = .194$, $p < .001$, 95% CI [.135, .252]) and Task Monitor ($r = .282$, $p < .001$, 95% CI [.225, .337]). The M-ASD effectively distinguished between ASD, non-ASD, and control groups (large to very large effect sizes). In the clinical ASD vs. non-ASD comparison, the M-ASD achieved 59% sensitivity, 79% specificity, 83% PPV, and 52% NPV (AUC = .734, 95% CI [.709, .758], $J = .3775$). When comparing clinical ASD with the control group, sensitivity was 93%, specificity 100%, PPV 100%, and NPV 75% (AUC = .989, 95% CI [.980, .994], $J = .9249$).

Conclusions:

The M-ASD demonstrated robust psychometric properties, including excellent internal consistency, test-retest reliability, and strong validity measures. However, the tool missed 48% of ASD classifications in the clinical group, underscoring the need for comprehensive diagnostic approaches beyond a single questionnaire. The relatively higher age and greater proportion of women in the control group may have impacted results. Overall, the Dutch M-ASD is a valuable screening tool for ASD with tailored cut-offs for clinical and general population use.

440.280 Validation of the TSC-Associated Neuropsychiatric Disorders Self-Report Quantified Checklist (TAND-SQ)

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Background: Tuberous Sclerosis Complex (TSC) is a rare genetic condition with high rates of associated neuropsychiatric disorders (TAND), including autism. A self-report quantified checklist for TAND (TAND-SQ), was recently developed. It includes 33 items making up seven natural TAND clusters (including an autism-like cluster). Each item is rated as having ever been present to generate cluster scores (CS), and given a severity rating (over the last month) to generate cluster severity scores (CSS) and a total TAND severity score (TTSS).

Objectives: This study aimed to validate the CS, CSS and TTSS of the TAND-SQ.

Methods: We used a descriptive group design and two convenience samples with existing relevant independent clinical data from the TSC Alliance Natural History Database (NHD) in the USA ($n=69$), with documented clinical diagnoses (including autism), and from the Developmental Synaptopathies Consortium Rare Diseases Clinical Research Network (RDCRN) study based at the Boston and Cincinnati Children's Hospitals ($n=23$). The RDCRN group had a range of widely-used standardised, behavioural measures and systematic autism diagnostic evaluations. We used Cronbach's alpha (α) to assess the reliability of the items within each cluster, and Spearman's correlations (ρ) to examine relationships between TAND-SQ scores, diagnoses and behavioural measures.

Results: We found acceptable internal consistency for the CS ($\alpha = .67-.89$) and CSS ($\alpha = .76-.95$), for all but the eat/sleep cluster. Most CS and all CSS were significantly correlated to corresponding clinical diagnoses reported in the TAND-SQ, with strong positive relationships observed for the autism-like CS and CSS and a diagnosis of autism ($\rho = 0.75$, $p < .001$ for both scores). The TTSS was significantly correlated to a global self-rating of TAND burden reported in question 10 of the TAND-SQ ($\rho = 0.75$, $p < .001$). In the RDCRN cohort, we found significant correlations between the CS, CSS, and TTSS and scores on a range of relevant standardised behavioural measures. The autism-like cluster CS and CSS were significantly correlated with measures of autism symptoms on the ADOS-2 ($\rho = 0.55$, $p < .033$ and $\rho = 0.58$, $p < .024$ respectively) and the Social Responsiveness Scale Social Communication Index ($\rho = 0.62$, $p = .007$ and $\rho = 0.66$, $p = .009$ respectively). The TTSS was significantly correlated with the Vineland-3 Adaptive Behavior Composite ($\rho = -0.75$, $p < .001$) and the Child Behavior Checklist ($\rho = 0.71$; $p = .001$). The autism-like CS was significantly associated with clinical autism diagnoses reported in the NHD cohort ($\rho = .64$, $p < .001$) and with systematic expert research diagnoses in the RDCRN cohort ($\rho = .48$, $p = .019$).

Conclusions: Findings support the internal consistency and convergent validity of the CS, CSS and TTSS of the TAND-SQ, including the autism-like cluster. Results suggest that the TAND cluster scores may be useful for guiding clinical decision making and care for individuals with TSC. For patients with high symptom burden, CSS might help families prioritise further evaluations for TAND. For patients with low symptom burden, endorsing any item should still prompt further referrals. Findings support further research of the TAND-SQ as a measure of natural TAND trajectories over time and as a possible behavioural outcome measure for TAND interventions.

Poster Session**441 - Digital Health Research or Technology Demonstration II**

May 3rd, 2025, 12:30 PM - 1:30 PM - Hall 4A

441.281 A Mobile-Health Project to Reduce the Tand Identification and Treatment Gap (TANDem) - Feasibility and Acceptability of the Tand Toolkit App

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Background: Tuberous Sclerosis Complex (TSC) is a rare genetic condition with high rates of TSC-associated neuropsychiatric disorders (TAND), including autism. TAND significantly impact the mental health of individuals with TSC and their caregivers, yet are often not identified or managed. The TANDem project was developed in partnership with families to reduce the TAND identification and treatment gap through a technological solution. The project aims included 1) the development and validation of a self-report quantified TAND Checklist (TAND-SQ) built into a mobile application (app), and 2) generation of consensus clinical recommendations for the identification and treatment of TAND, to be incorporated as a TAND toolkit in the app.

Objectives: The focus of this study was to evaluate the feasibility and acceptability of the TAND Toolkit App to TSC stakeholders.

Methods: The mobile app and the TAND toolkit were initially developed separately. In a formative phase, the app and the toolkit were evaluated individually by multiple stakeholder groups using rapid user acceptance evaluation feedback and revision loops. The app was evaluated by the TAND consortium (n=11), and caregivers and individuals with TSC from Boston Children's Hospital and Cincinnati Children's Hospital (n=23) using an in-app feedback form. The TAND toolkit was evaluated by members of the TAND consortium (n=19), and caregivers and individuals with TSC from the TSC Alliance and TSC International (n=11+6) via an electronic toolkit feedback form. Members of TSCi (n=33) also participated in an in-person focus group. The app and toolkit were then integrated into the TAND Toolkit App and evaluated in a summative phase by a group of Belgian caregivers and individuals with TSC recruited through the Belgian TSC support organisation (be-TSC) using an app feedback form (n=10), toolkit feedback form (n=20), and online focus group (n=3).

Results: The formative evaluation phase yielded a wealth of suggestions for changes that were then incorporated into subsequent rounds of reviews. Pooling the quantitative feedback from both the formative and summative phases, for the app (n=44) 91% of users tested the app on a smartphone (66% iOS users) and 9% a tablet/iPad. The majority (91%) rated the language in the app easy to understand, liked the app user interface, and found the steps for progressing through the app logical, with an overall app rating of 91%. For the toolkit (n=56), most participants rated the information for each TAND cluster as 'helpful' or 'very helpful': autism-like = 91%, dysregulated = 88%, eat/sleep = 89%, mood/anxiety = 89%, neuropsychological = 89%, overactive/impulsive = 93%, scholastic = 84%, and psychosocial = 86%, with an overall acceptability rating of 86% for the toolkit. The majority of Belgian families (75%) gave the integrated TAND Toolkit App a 4- or 5-star rating. Qualitative feedback highlighted the need for multilingual functionality and for flexibility to use the app on a mobile device or a computer.

Conclusions: The TAND Toolkit App is a feasible and acceptable mobile-health information app for families and individuals with TSC. Some additional features may make it more feasible for global use.

441.282 Acceptability and Feasibility of a Digital Remote Measurement System for Autism and Co-Occurring Conditions

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Background:

Advances in treatment development for issues affecting the everyday lives of autistic people (e.g., mental health and sleep problems) are hampered by the limitations of conventional outcome measures (e.g., potential for bias in patient-reported outcomes). Digital remote monitoring technology (RMT) offers opportunity for low-burden collection of subjective and objective data during everyday life. However, applicability of such technology in autism research depends on its acceptability to autistic participants, and the feasibility of implementation in clinical research.

Objectives:

We aimed to develop a novel RMT system to collect data on autistic traits, sleep, mood, and attention, and to evaluate its acceptability and feasibility among autistic and non-autistic smartphone users.

Methods:

We invited autistic and non-autistic participants in the Longitudinal European Autism Project (aged 12 and older; independent Android smartphone users) to enrol in a 28-day “Mobile Measures Month”. Our system (using the RADAR-base mobile health research platform; Ranjan et al., 2019) involved wearing a Fitbit Inspire 2 device and downloading several smartphone applications. Two applications enabled active daily reporting (e.g., on sleep quality, mood, and attention). A third application collected data from smartphone sensors (e.g., app usage, call and messaging logs, and location) passively. At the end of the month, participants completed the System Usability Scale (SUS; Brooke, 1996) to indicate the overall usability of the system. Total SUS scores have a possible range of 0-100. Scores exceeding 70 are considered to indicate acceptable usability, above 75 indicate good, and above 85 indicate excellent usability. Data acquisition for this study is complete and data analysis is underway.

Results:

Of 82 LEAP participants screened for eligibility, 41 (48.7%) were eligible, with most ineligible participants being iPhone users (n=34). Of those eligible, 32 (78%) consented and nine (22%) declined, with reasons including data privacy concerns (n=1) and anticipated daily reporting burden (n=3). Including 18 additional participants following an alternative recruitment path, 47 (34 autistic) participants enrolled and 46 (97.9%) continued participation in at least one component throughout the 28 days (see Figure 1). Preliminary analyses show that of a possible 28 sleep quality reports requiring daily completion, participants completed an average of 21.9 (standard deviation 7.79; range 2-28). Mean SUS for autistic participants and 81.1 (SD 11.6; range 62.5-95.0) for comparison participants. The difference between groups was not significant ($t=-1.7$; $df=32$; $p=.099$). Adherence to wearing the Fitbit was variable (see Figure 2) and patterns will be explored further. Availability of passive smartphone data, and associations of acceptability and adherence data with participant characteristics will be explored.

Conclusions:

Most eligible participants consented to and completed the study, and usability ratings were favourable. Compatibility of smartphone applications across operating systems was a considerable barrier to feasibility; however, preliminary findings show this application of RMT to be largely acceptable among the autistic smartphone users in this study. Further analysis will yield insight into participant characteristics that may affect acceptability, laying important groundwork for future studies using RMT in autistic populations.



441.283 An Exploratory Study of Cardiac Synchrony and Joint Engagement in Parent-Child Dyads of Autistic and Neurotypical Children

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Background: Research on dyadic physiological synchrony in children with autism spectrum disorder (ASD) compared to neurotypical children has yielded mixed results, generally indicating reduced or atypical synchrony in ASD. Understanding these patterns has important implications for identifying biomarkers and developing social interventions. Further research can clarify how physiological processes contribute to synchrony and how synchrony patterns vary across contexts.

Objectives: We aimed to understand the role of heart rate variability (HRV) as a putative physiological mechanism underlying parent-child joint engagement (JE) by: 1) Assessing whether parent-child dyads with and without ASD differ in trend and concurrent HRV synchrony; 2) Investigating whether trend and concurrent HRV synchrony predict JE during play.

Methods: We obtained behavioral and cardiac data from video and ambulatory electrocardiograph (ECG) recordings in 11 parent-child dyads with ($n=5$; M[SD]: 4.1[1.2 years) and without ASD ($n=6$; 3.3[1.0 years) while engaged in a 15-minute dyadic play task in the enTRAIN study. The enTRAIN study assessed interpersonal physiological dynamics through semi-structured socioemotional regulation tasks and parent-report questionnaires. Each dyad received the same set of toys and was instructed to play together as they would at home, while parent and child ECGs were recorded simultaneously with the chest-worn Actiwave Cardio (CamNtech). ECG data were pre-processed into interbeat intervals to extract the HRV root mean square of successive differences (RMSSD). We then quantified trend and concurrent HRV synchrony as low- (LF) and high-frequency (HF) wavelet coherence of parent and child RMSSD, respectively. Dyadic proximity was calculated from video using three-dimensional pose estimation with popular deep learning models. Supported and Coordinated JE events were independently annotated in Datavyu by blinded, reliable raters (90% agreement, Gwet's $AC_1=.88$) according to Bakeman and Adamson's (1984) State-Based Joint Engagement scheme. To assess differences in trend/LF and concurrent/HF HRV synchrony between dyads with and without ASD, we used linear mixed-effects models (LMMs), accounting for repeated HRV synchrony measures within each dyad. To examine whether parent-child HRV synchrony predicts JE, we used Bayesian mixed-effects multinomial logistic regression models (MEMLR) with four Markov chains and 2000 iterations, normal priors for fixed effects, and Cauchy priors for random effect standard deviations.

Results: Our LMMs revealed no effect of ASD diagnostic status on either trend ($\beta=.01$, $p=.78$) or concurrent ($\beta=.02$, $p=.24$) HRV synchrony. Similarly, MEMLR models showed no effect of ASD diagnostic status on Supported or Coordinated JE outcomes. However, a greater HRV synchrony was associated with a reduced likelihood of Supported JE ($OR=.60$) and an increased likelihood of Coordinated JE ($OR=5.04$). Greater concurrent HRV coherence was also associated with a reduced likelihood of Supported JE ($OR=.47$) but not linked to Coordinated JE. Across all models, reduced dyadic proximity was associated with increased likelihoods of both Supported and Coordinated JE.

Conclusions: Autistic and neurotypical toddlers did not differ in cardiac synchrony with their parents; however, there is limited statistical power in our small sample size. Across groups, closer physical proximity and HRV synchrony are associated with JE, highlighting the potential clinical significance of HRV synchrony as a dyadic physiological marker of relational engagement.



441.284 Digitalising Care Pathways in LMIC: Implementing a Web-Based Tool in the Autism-Care Pathway in Sri Lanka

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Background: Transitioning towards web-based data collection and database creation can help improve service delivery by addressing communication and coordination issues commonly seen in the fragmented care pathways in Lower and Middle income countries (LMIC). The NAMASTE (Neurodevelopment and Autism in South Asia: Treatment and Evidence) project is working to facilitate early detection of autism and NDD in Sri Lanka, India and Nepal. A web-based tool is used in this project to digitalise the autism care pathway, from identifying children with a high likelihood of autism, to the referral process and follow-up. Recognising the challenges of implementing digitalised care pathways in LMIC, NAMASTE took an iterative approach to the process of developing and implementing the tools, digitalising the referral pathway and data storage, in Sri Lanka.

Objectives: This paper aims to 1) describe the iterative process of developing web-based data collection tools and an implementation protocol, and 2) explore the facilitators and barriers related to digitalising care pathways in an LMIC setting.

Methods: Key stakeholder interviews, and initial focus group discussions (FGDs) among the implementation team and health ministry officials assessed current procedures and necessary modifications to set up a digitalised care pathway. Once the first version of the tools and the pathway were set up and a pilot carried out, we ran a second round of FGDs involving end users: 16 Medical Officers of Health (MOHs) and 48 Public Health Midwives (PHMs), to assess barriers and facilitators to implementation.

Results: Following discussions with the officials, we identified that the process unfolded in two phases. The Setting Up Phase involves 1) Comprehensive review of methods and tools for data collection and storage 2) Needs assessment of resources and infrastructure – physical and digital, skills, personnel 3) Obtaining approvals – regulatory, software web tools 4) Developing web-based tools, 5) Training and facilitating implementation of the web-based tools among MOHs and PHMs. In the second, Implementation Phase, the end-users 1) implement detection tools, 2) collect and transmit data using survey links, 3) receive feedback on next steps from the web-based tool based on an inbuilt triaging mechanism, 4) convey findings to caregivers, 5) refer relevant children for consultant diagnosis. The in-built triaging mechanism also informed end users which of the two caregiver training packages was suitable for each parent and where they consented, passed on their details to NAMASTE. The facilitators and barriers of the process of transitioning into digitalised care pathways were as follows: behavioural - limited data literacy, resistance to change; organisational - lack of skilled personnel and financial constraints; and technical - weak digital infrastructure, lack of interoperability. **Conclusions:** The initial identification and referral steps and part of the support pathway (support packages for caregivers) were effectively digitalised. Inter-operability with the management care data systems, once identified children are referred for consultant care, remains a challenge.

441.285 Engaging the Brain with "CICADAS": A Novel Neuroplasticity-Based Social Cognitive Training Application for Autistic Teens

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Background: During adolescence, neural networks subserving socioemotional and cognitive processing undergo dynamic, adaptive changes in response to increasingly complex socially-demanding environments.¹ For autistic youth who struggle with social communication and interaction, restricted interests, repetitive behaviors, and atypical responses to sensory stimuli,² the critical teenage neurodevelopment period can be particularly challenging. Further, avoidance of discomfiting social stimuli and contexts may preclude experience-dependent acquisition of key functional skill-sets. Yet, despite the increasing global prevalence of autism spectrum disorder (ASD), evidence-based interventions designed to improve outcomes in autistic adolescents are still lacking.³ In recent years, implementations of computerized, adaptive brain-based targeted cognitive-training (TCT) programs have improved general cognitive deficits in neuropsychiatry (e.g., schizophrenia, depression, ADHD).⁴ Thus, leveraging our pilot data testing TCT program in autistic adolescents and young adults⁵ and prior findings from patients with psychosis,⁶ we developed CICADAS (Care Improving Cognition for ADolescents on the Autism Spectrum), a digital application designed to prime the brain to engage in flexible, adaptive long-term socioemotional learning using closed-loop technology. For example, increasing auditory processing speed through TCT may strengthen receptive language capacities.

Objectives: We aimed to evaluate the CICADAS app as a stand-alone intervention or in conjunction with remotely delivered PEERS (Program for the Education and Enrichment of Relationship Skills), one of the few evidence-based social skills programs available for autistic teens.^{7,8} We hypothesized that using the CICADAS app would prime individuals to engage more efficaciously with social cognitive experiences and training.

Methods: We recruited N=62 (11-18yrs; 41M;17F;4NB) participants with confirmed ASD from PEERS clinics for a three-arm, active-controlled, randomized crossover trial (Groups: CICADAS, PEERS+CICADAS, PEERS+Active-Control; AC). Performance, adherence, and engagement metrics for TCT tasks were used to evaluate feasibility and acceptability of the mobile app. Adolescent self-report and parent-report outcome assessments were administered at Pre-Intervention, Post-Intervention, and 16-week Follow-Up sessions with measures including standardized, validated questionnaires of social, behavioral, and cognitive function. We applied linear mixed models to evaluate efficacy of CICADAS as a stand-alone intervention or as an augmentation to PEERS.

Results: Demonstrating feasibility, 80.0% of participants completed immediate post-training assessments and 73.3% of participants completed 16-week follow-up assessments. Significant effects of GROUP, TIME, and GROUPxTIME interactions were found on several measures collected over three time-points. For example we found significant effects of time on the Pediatric Quality of Life Inventory Total Scale ($F = 6.758, p = .002$) with the PEERS+CICADAS group showing improvements on the composite measure of Psychosocial Health ($F = 7.029, p = .001$) greater than the CICADAS only ($F = 2.150, p = .122$) and PEERS+AC ($F = 1.872, p = .160$) groups. Repeated measures of the Social Responsiveness Scale, 2nd Edition also showed significant effects of TIME ($F = 10.989, p = .000$); notably, only the PEERS+CICADAS group demonstrated significant improvement across all three time-points ($F = 3.786, p = .026$) on the Social Cognition subscale.

Conclusions: Our findings demonstrate that CICADAS is not only feasible, deliverable, and beneficial as a stand-alone program, but engaging in the adaptive CICADAS app (versus static AC) conferred an additional advantage to autistic teens who participate in the established PEERS program.



441.286 Factors Influencing Data Completion and Quality in a Remote Autism Screening Study

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Background:

The COVID-19 pandemic promptly necessitated remote measures in research. Despite returning to in-person activities, hybrid and remote opportunities remain priorities for researchers and participants. This highlights the need for effective participant instruction in studies using remote methods. While the effectiveness of asynchronous vs. synchronous classroom instruction has been explored, a gap remains in comparing remote instruction modalities in research.

This study aims to assess factors influencing data acquisition in a remote study evaluating the accuracy of a digital autism screening application (*SenseToKnow* iPad/iPhone mobile app). The relationship between caregiver demographic background and preference for asynchronous vs. synchronous instruction was investigated, as was the relationship between instruction type preference and instruction completion and app attempt/completion.

Objectives:

- 1) Determine whether caregiver demographic characteristics, including primary language, race/ethnicity, age, and education level, are associated with instruction type preference, app attempt, and app completion.
- 2) Determine whether caregiver instruction completion, app attempt, or app completion differ based on instruction type preference (YouTube vs. Zoom).

Methods:

Participants (n=1,342) were caregivers of children, aged 6-36 months, recruited through primary care practices, Children's Developmental Services Agency, and the broader community.

Asynchronous instructions involved a 5-minute YouTube video; synchronous instructions involved a 15–30-minute Zoom meeting. An app attempt was defined as ≥ 1 of 9 app videos completed; app completion was defined as ≥ 5 of 9 app videos completed. Primary language was the language in which consent was provided for study entry (English/Spanish).

We evaluated caregiver demographic differences with standardized mean differences (SMD); we fit logistic regressions to determine whether app instruction completion, app attempt, or app completion differed by instruction type preference, when controlling for demographics (SMD >0.1).

Results:

Race/ethnicity (SMD=0.60), primary language (SMD=0.25), and education level (SMD=0.47) differed between participants who chose YouTube vs. Zoom for receiving app instructions.

Race/ethnicity (SMD=0.39), education level (SMD=0.44), and age (SMD=0.19) differed between those who attempted the app vs. those who did not.

Race/ethnicity (SMD=0.40), education level (SMD=0.47), and age (SMD=0.17) differed between those who completed the app vs. those who did not.

Participants who chose Zoom for receiving app instructions were significantly less likely to complete app instructions vs. those choosing YouTube (odds ratio (OR)=0.65, 95% confidence interval (CI)[0.46, 0.90]).

There was no significant difference in rates of attempting or completing the app when comparing those who chose Zoom vs. YouTube for receiving app instructions (attempting OR=0.91, 95%CI[0.66, 1.25]); (completing OR=0.93, 95%CI[0.67, 1.28]).

Conclusions:

Findings reveal that preferences regarding receipt of study instructions differ by demographic group (see Table 1). Results underscore the importance of synchronous instruction, as Spanish-speaking participants were more likely to choose Zoom compared to English speakers, emphasizing the need for multilingual staff to ensure equitable participation. However, asynchronous instruction (e.g., YouTube) proved valuable, given lower completion rates for those who chose Zoom. Future analyses, to be presented at the conference, will consider the relationship between preferred instruction type and quality of data collected.



441.287 Haptikart: An Engaging Videogame Reveals Elevated Proprioceptive Vs. Visual Bias in Individuals with Autism Spectrum Disorder

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Background: The integration of visual and proprioceptive input is key to learning actions like social gestures, tool use, and motor skills. Understanding how visual vs. proprioceptive input is weighted helps us better comprehend child development patterns. Research suggests children with autism spectrum disorder (ASD) rely heavily on proprioceptive input, which causes challenges in visual-motor integration (VMI). For instance, children with ASD struggle with tasks such as catching balls, tracking moving objects, and imitating motor actions. Traditional methods for quantifying sensory-motor bias are cumbersome and limited in clinical use. To address this, we developed “HaptiKart,” an engaging video game that uses a force-feedback steering wheel to explore differences in proprioceptive and visual bias in children with ASD compared to typically developing (TD) peers.

Objectives: This study aimed to: (1) explore the impact of ASD on perceptual bias (proprioceptive vs. visual), (2) examine the influence of age and age-by-(autism) diagnosis interactions on perceptual bias, and (3) investigate relationships between perceptual bias and ASD severity, ADHD symptoms, and intellectual ability.

Methods: Eighty-one participants (33 with ASD and 48 TD), aged 8 to 31 years, played “HaptiKart,” a driving game using a force-feedback steering wheel to offer “steering assist.” Participants were group-matched by age and sex. The task involved steering a car along a track at a constant speed, using both visual feedback from the monitor and proprioceptive feedback from the steering wheel (**Fig. 1A-B**). After a familiarization period, participants completed two conditions (each lasting ~2 minutes) in a counterbalanced order: (1) non-delayed visual feedback with a 300-ms delay in proprioceptive feedback (V+DP) and (2) 250-ms delayed visual feedback with non-delayed proprioceptive feedback (DV+P). A one-minute washout block with non-delayed visual and proprioceptive feedback separated the conditions. Bias scores were calculated by subtracting performance in the DV+P condition from the V+DP condition (bias score = V+DP – DV+P), with positive scores indicating proprioceptive bias and negative scores indicating visual bias. We used ANCOVA to analyze how diagnosis and age impacted bias scores, controlling for sex, and explored associations between bias and autism severity (ADOS-2 and SRS-2 scores), ADHD symptoms (Conners4 scores), and IQ (GAI).

Results: Consistent with our hypothesis, the ASD group showed a significantly higher proprioceptive bias compared to the TD group (ASD>TD; $p = 0.002$) (**Fig. 1C**). Across all participants, there was a trend toward decreasing proprioceptive bias with age ($p = 0.06$), but no significant diagnosis-by-age interaction ($p = 0.68$). Higher proprioceptive bias was associated with greater autism severity (ADOS-CS: $r = 0.48$, $p = 0.035$; SRS-2: $r = 0.52$, $p < 0.001$) and lower IQ ($r = 0.54$, $p < 0.001$), but not with ADHD symptoms ($r = 0.17$, $p = 0.38$).

Conclusions: Our novel driving videogame, HaptiKart, revealed individuals with ASD show an increased reliance on proprioception, correlating with autism severity and lower IQ. HaptiKart offers a brief, engaging and scalable approach for assessing autism-associated differences in sensory-motor bias and could thereby serve as a digital biomarker to monitor autism symptoms and guide future interventions.



441.288 Preliminary Results of a Randomized Controlled Trial on the Use of Intransitive Gestures in a Sample of Italian Preschool Children with Autism Spectrum Disorder

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Background: The importance of early intervention in Autism Spectrum Disorders (ASD) has been widely demonstrated, and developmental trajectories in ASD highlight the importance of nonverbal communication, such as intransitive gesture production, as a possible positive prognostic factor for language development.

The use of technological tools in ASD therapy has also become increasingly important due to the increased engagement and responsiveness in ASD to technological objects, such as robots.

We therefore developed a training protocol using the humanoid robot NAO, called IOGIOCO (Interactive mirroring Games wIth sOCial rObot), based on the use of intransitive gestures embedded in naturalistic dialogues, stimulating a triadic interaction between child, robot and therapist. The protocol included different complexity levels, from mirroring tasks to spontaneous interactions. We previously tested the protocol on 10 ASD children aged 2–6 years in a pilot study finding promising results[1].

Objectives: The main aim is to test the effectiveness of the IOGIOCO protocol, by analyzing the preliminary results of the first group of subjects included in a crossover Randomized Controlled Trial. (Ethics Committee approval ID: 07_29/03/2023).

Methods: We aim to enroll 20 preschool children with an ASD diagnosis according to DSM-5 criteria (confirmed by ADOS-2). We will test them at T0 and randomly assign them to two groups, G1 and G2, according to a cross-over design. After T0 assessment, G1 will undergo a 12-weekly-session training with the social robot NAO, while G2 will continue the therapy as usual. After a second assessment of the entire cohort at T1 (after 12 sessions) G1 will be included in a follow-up group, while the G2 will undergo the social robot intervention. Finally, all participants will be assessed at T2, i.e. 12 weeks after T1. ABAS II and MacArthur-Bates number of gestures will be administered at the three-time points, while Griffiths-III will enrich T0 assessment. Finally, we will administer a satisfaction questionnaire to parents on 11 questions on a Likert scale (1,Not-at-all satisfied- 5,Extremely satisfied).

Results: Up to now, 11 subjects (mean age 50 months, SD 13, F:M=3:7, General Quotient(GQ) at Griffiths-III=45) have completed the intervention protocol (Experimental Group, EG), and 7 (mean age, 51 months, S.D. 13, F:M=3:4,GQ=39) have concluded the control period (Control Group,CG). A Mann-Whitney U test did not highlight significant differences between the two groups for General Quotients at Griffiths III ($p=0.68$) and age ($p=0.79$).

We used Mann-Whitney test to compare the variations from T0 to T1 of the experimental and the control groups respectively, and we found significative differences in Social Domain ($p < 0.01$) and in Practical Domain ($p=0.04$) of ABAS-II questionnaire (Figure). The results of the satisfaction questionnaire indicate a high level of satisfaction with the training program (mean: 3,9;SD 0,7).

Conclusions: Preliminary results show a significant improvement in the intervention group compared to the control group in two subdomains of the ABAS-II. These data need to be confirmed by a larger sample, but they suggest an impact of the social robot intervention on ASD children's adaptive skills compared to therapy as usual.



441.289 Towards Objective Social Behavior Analysis: A Multi-View Digital Solution for Direct Eye Contact Detection during Naturalistic Free Play Assessments

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Background:

Individuals with autism spectrum disorders (ASD) are often reluctant to make direct eye contact with their social partners during naturalistic social interactions. This is one of the central behavioral markers in assessing the effectiveness of social functioning during free play. Existing gold-standard clinical diagnostic tools often introduce subjective biases and rely heavily on clinicians' decisions. Accurate identification and objective assessment of social behaviors, such as direct eye contact, remain challenging. This is particularly true in naturalistic, free play settings. There remains a critical need to identify direct eye contact in naturalistic settings to mimic real-world social interactions and assist in the assessment of social functioning.

Objectives:

This study aimed to develop a deep learning-based framework for detecting direct eye contact between children and assessors in social interaction sessions during free play. The reliability of the framework was compared with expert-annotated direct eye contact behaviors observed during the sessions.

Methods:

We developed a multi-view social behavior detection framework that analyzes spatial and temporal features of direct eye contact behaviors between child participants and assessors in 5-minute free play sessions. This study involved video footage from 136 children aged 3 to 12 years, comprising 103 children with ASD diagnosis and 33 typically developing children. The proposed framework was trained with sparsely sampled true color spatial images, and optical flow images representing the moving patterns of direct eye contact behaviors between the child and assessor. Video footage collected from multiple views was fed into the trained deep learning model, providing an average consensus of the detected social behavior. The children's caregivers were allowed to sit in the assessment room during the free play session to create a familiar environment for the child participant.

Results:

The proposed framework demonstrated highly competitive performance in identifying direct eye contact behaviors in free play compared to manual subjective coding. The inter-rater reliability kappa value for expert annotations was 0.812 (SD: 0.179). Our proposed framework achieved F1 scores of 85.42% and 90.04% in single-view predictions for the "eye contact" and "no eye contact" segments, respectively. In multi-view prediction, the F1 scores significantly improved to 91.96% and 94.48%.

Conclusions:

The results highlight the effectiveness of digital methods for objectively analyzing social behaviors during social functioning assessments through multi-view approaches. Significant improvements in F1 scores and the robustness of the proposed framework were observed in detecting direct eye contact behavior during free play, even when multiple individuals were present. These findings demonstrate the scalability potential of our proposed framework for implementation in clinical settings. The high degree of agreement between the deep learning model predictions and manual coding by trained experts suggests that social behaviors among multiple people can be quantified, indicating that digital translation of such tools has the potential to be integrated into standardized clinical practice.

441.290 Using AI Facial Expression Analysis Software to Assess Negative Affect in Autistic Children

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Background: Emotion regulation difficulties often contribute to impairments in social, emotional and academic functioning in autistic children. Traditional assessment tools, such as parent-report and teacher-report questionnaires and observational assessments are time-consuming, expensive and prone to bias. Advances in technology, such as facial expression analysis software, hold promise in offering efficient and objective approaches to assessing emotion regulation in naturalistic environments.

Objectives: This study examined the feasibility and accuracy of iMotions' AFFDEX SDK 5.1 facial expression analysis technology in coding negative expressed affect in autistic children. This software was chosen as it has been used in past research studies with autistic children (e.g. Ahn et al., 2024; Alarifi et al., 2023). This is the first study to independently validate the software with autistic youth.

Methods: Participants included 50 autistic children aged seven to 12 years (44 males, 6 females) with cognitive abilities within the average range. This was a fully remote study, with participants recruited from three Australian states.

Parents set-up their children at a computer with a webcam in their home to play a frustrating video game 'Space is 'Key'. Children joined a videoconference with the assessor who observed them playing the video game remotely for five minutes. For a final two minutes, children were encouraged to do an activity of their choice, to help them to calm down before the assessor logged off. Assessment sessions were videorecorded and later coded by two independent human raters for negative expressed affect from facial expression and iMotions' AFFDEX SDK 5.1 facial expression analysis software.

Results: The average percentage of codable video clip intervals was 90% for Rater 1, 89% for Rater 2 and 79% for the iMotions software. The main factors contributing to intervals not being coded were children moving 'offscreen' or their webcam image being too pixelated to code. Visible signs of negative expressed affect through facial expression were coded 33.05% of the time by Rater 1 (SD=31.14), 32.75% of the time by Rater 2 (SD=31.55) and 3.42% of the time by the AFFDEX AI algorithm (SD=5.55). Correlational analyses indicated a strong correlation between the negative affect ratings of the two human raters ($r=.99$, $p<.001$), and weak and non-significant correlations between the human raters and AI algorithm ($r_s<.18$, $p_s>.23$). Examination of the signal data from AFFDEX SDK 5.1, synched with participants' video footage, suggested that the software lacked sensitivity in capturing subtle signs of negative affect (e.g. sad or staring eyes), and interpreted anxious or frustrated facial grimacing as positive affect (smiling).

Conclusions: Facial expression analysis software holds promise as an objective, efficient and cost-effective measure of emotion regulation in autistic children in both clinical and research contexts. This study assessed the feasibility and accuracy of iMotions' AFFDEX SDK 5.1 facial expression analysis software in coding negative expressed affect in autistic children while playing a frustrating video game. Results suggested that the AI algorithm lacks sensitivity and validity in assessing autistic children. This study highlights the importance of independent validation of technological innovations for different subpopulations, including autistic youth.

441.291 Wearable Devices Demonstrate the Relationship between Sleep Problems and the Severity of Autism Symptoms

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Background: Sleep disturbances are of high interest in autism research given their reported high prevalence and deleterious impact. Previous autism sleep studies have mostly used subjective parent questionnaires and reported that autistic children with more severe sleep problems also exhibit more severe core symptoms, aberrant behaviors, and sensory sensitivities. However, studies using objective sleep measures from actigraphy, and polysomnography (PSG) recordings of autistic individuals have rarely assessed these relationships. Here we explored the Simons Sleep Project (SSP) data, a new open-science resource with multi-night data from multiple wearable and nearable devices to assess such relationships.

Objectives: To extract objective sleep measures from multiple wearable devices including actigraphy and ambulatory EEG and determine their relationship with the severity of core autism and co-occurring symptoms.

Methods: The SSP contains data from 102 families who reported having one autistic child and one non-autistic sibling, both 10-17 years old. Parents completed multiple questionnaires and received a Dreem3 EEG headband (Beacon Biosignals Inc.), EmbracePlus smartwatch (Empatica Inc.), and Withings Sleep mat (Withings Inc.). Simultaneous data was collected from all devices along with a sleep diary for 2-3 weeks from each child, yielding a final dataset of 1772 nights with successful simultaneous data from all three devices. We used automated sleep scoring by EmbracePlus and Withings to classify sleep/wake epochs and the POPS algorithm (LUNA software) to classify sleep/wake epochs in the raw EEG data. We then computed sleep onset, final awakening, wake after sleep onset (WASO), total Sleep Time (TST), sleep onset latency (SOL), and sleep regularity index (SRI) from the three devices. We computed Pearson Correlation Coefficients between each of sleep measures and parent reported scores from the Vineland (adaptive behaviors), Child Sleep Habits Questionnaire (CSHQ, sleep disturbances), Aberrant Behaviors Checklist (ABC), Social Responsiveness Scale (SRS, core autism symptoms), and Sensory Profile (SP, sensory problems).

Results:

In line with previous literature, we found that parent-reported sleep disturbances (CSHQ) were positively correlated with the severity of parent-reported core symptoms (SRS scores), sensory problems (Sensory profile) and aberrant behaviors (ABC scores) ($r > 0.3$, $p < 0.001$) and negatively correlated with Vineland scores ($r = -0.38$, $p < 0.001$). Similar, weaker relationships were apparent between SOL and the same behavioral measures. Vineland scores were negatively correlated with SOL (actigraphy: $r = -0.19$, $p = 0.007$; EEG: $r = -0.19$, $p = 0.006$) while sensory avoiding scores from the Sensory Profile were positively correlated with SOL (actigraphy: $r = 0.27$, $p < 0.001$; EEG: $r = 0.24$, $p < 0.001$) as were SRS total scores (actigraphy: $r = 0.24$, $p < 0.001$; EEG: $r = 0.18$, $p = 0.01$) and ABC hyperactivity scores (actigraphy: $r = 0.26$, $p < 0.001$; EEG: $r = 0.31$, $p < 0.001$). In contrast, WASO, TST, and SRI measures were not significantly correlated with any of the symptom scores. Similar results were found when examining the entire sample (autism and siblings) or each subgroup separately.

Conclusions: These findings suggest that SOL, whether measured with actigraphy or EEG, is an objective sleep measure of particular interest that quantifies a specific sleep disturbance with potential impact on the severity of multiple symptom domains. It suggests a specific target for intervention that could potentially have cascading effects on the severity of multiple symptom domains.

Poster Session

442 - Social Cognition and Social Behavior II

May 3rd, 2025, 12:30 PM - 1:30 PM - Hall 4A

442.292 The Relationship between Social Motor Synchrony and Self-Rated Rapport in Autistic, Non-Autistic and Mixed Dyads

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Background: Social Motor Synchrony (SMS) during social interactions is associated with increased interpersonal rapport—a sense of friendly connection characterised by mutual understanding and ease of communication—in non-autistic populations. Previous research suggests that autistic people exhibit lower SMS during social interactions with both autistic and non-autistic partners (Georgescu et al. 2020). However, it remains unclear whether this impacts autistic experiences of rapport, as the relative importance of synchrony in social communication strategies may differ between autistic and non-autistic populations.

Objectives: This study had three aims: first, to replicate and extend previous findings of reduced SMS in dyads involving at least one autistic person; second, to examine the relationship between SMS and interpersonal rapport within autistic ($n = 12$), non-autistic ($n = 17$), and mixed dyads ($n = 14$; total N participants = 86); and third, to assess the reliance on SMS for achieving rapport among autistic and non-autistic participants. By investigating these dynamics, we aimed to provide insights into the role of synchrony in social interactions across different neurotypes.

Methods: Participants engaged in a 5-minute unstructured conversation with an unacquainted partner. These interactions were video-recorded and analysed using Motion Energy Analysis (MEA; Ramseyer, 2020), a method that quantifies movement by detecting changes in video frames over time. MEA generates time-series data, which are sequences representing each participant's movement intensity at successive time points throughout the conversation. SMS was computed by calculating the cross-correlation between the two participants' time-series data. This cross-correlation assesses the degree to which participants' movements are temporally aligned, providing a quantitative measure of SMS.

Results: Contrary to previous findings, we did not observe reduced SMS in autistic-matched and mixed dyads compared to non-autistic dyads ($F(2, 40) = 0.09, p = .913, \eta^2 = .005, 95\% \text{ CI } [0.00, 1.00]$). For all three neurotypes, Frequentist (all $ps > .05$) and Bayesian (all 95% credible intervals included zero) analyses did not support the notion that SMS significantly predicts rapport. However, we found that SMS has a stronger positive effect on rapport in non-autistic dyads compared to autistic dyads ($Mdiff = 4.14, SE = 1.90, t(39) = 2.176, p = .036, \text{ CI } [0.29, 7.98]$; Fig 1). Indeed, our participant-level analysis indicated that non-autistic participants require a higher ratio of SMS to rapport compared to autistic participants ($M = 0.65, SD = .21, t(84) = 2.04, p = .022, d = .45, \text{BF}_{10} = 1.3$; Fig 2). This suggests that non-autistic individuals have a higher threshold, requiring more SMS to achieve high levels of rapport.

Conclusions: These findings indicate that SMS does not differ significantly across neurotypes in short conversational tasks. However, non-autistic people appear to rely more on SMS to build rapport, whereas autistic people may utilise different strategies for establishing interpersonal connections. These findings highlight the need to consider neurodiversity in social interaction research, promoting improved communication and mutual understanding across different neurotypes. Recognising that the mechanisms contributing to rapport may differ between autistic and non-autistic people can better support mutual understanding across diverse social contexts.



442.293 Information Transfer and Self-Assessment of Solutions within and between Autistic and Non-Autistic Adults.

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Background: Previous research (Crompton et al., 2020) found that chains of autistic people transmitted information as effectively as chains of non-autistic people. However, when autistic and non-autistic people interacted with each other in mixed-neurotype chains, information sharing deteriorated and less information was transmitted. These findings challenge clinical (American Psychiatric Association, 2013) and social cognitive characterizations of autistic individuals as uniformly deficient in social communication (Kapp, 2019) and suggest information transfer in autism is contextually-dependent.

Objectives: The current study tested whether Crompton et al.'s (2020) findings generalised to a larger, multi-site sample using a task requiring the transmission of primarily visual information as opposed to verbal. We also examined how accurately participants self-assessed performance, as self-assessment accuracy has been shown to predict functional outcomes better than objective performance (Gould et al., 2015; Silberstein et al., 2018) and may be reduced for autistic people (DeBrabander et al., 2021). Moreover, our data provided a unique opportunity to examine self-assessment accuracy in autistic and non-autistic people interacting in real-time, a skill that may be important for changing one's behaviour during social situations like interviews and meetings.

Methods: 310 adults (154 autistic) were allocated to one of three "diffusion chain" conditions consisting of six participants each: (i) autistic, (ii) non-autistic, or (iii) mixed autistic and non-autistic. The first participant (Participant 1) in each chain watched a video of an experimenter creating a specific shape from a puzzle toy that could be manipulated into a wide range of shapes. Participant 1 was told to show Participant 2 how to make a dog, who showed Participant 3, and so on until the end of the chain (Participant 6). Accuracy (Objective Performance) was scored as the number of puzzle pieces in the correct location; self-assessment was measured on a 100-point scale and the accuracy of this self-assessment was calculated by comparing it to Objective Performance.

Results: All analyses were pre-registered. There was no difference in the amount of information transmitted between autistic and non-autistic chains ($\beta = 6.74, SE = 9.16, t(51.7) = 0.74, p = 0.47$); however, mixed chains also transmitted a comparable amount of information to autistic ($\beta = -7.38, SE = 9.15, t(51.4) = -0.81, p = 0.42$) and non-autistic ($\beta = -0.64, SE = 9.15, t(51.4) = -0.07, p = 0.95$) chains (Figure 1; left panel). Participants in autistic and non-autistic chains also did not differ in the accuracy of their self-assessment ratings ($\beta = 6.48, SE = 10.36, t(52.3) = 0.63, p = 0.53$), and mixed chains did not differ from autistic ($\beta = -5.34, SE = 10.34, t(51.8) = -0.52, p = 0.61$) or non-autistic ($\beta = 1.14, SE = 10.31, t(51.3) = 0.11, p = 0.91$) chains (Figure 1; right panel).

Conclusions: Both autistic and non-autistic participants shared information with others and evaluated their performance similarly. This supports Crompton et al. (2020), showing that the result generalises to the transmission of different types of information and was not an artefact of their language-based task. However, the predicted breakdown in information sharing in the mixed chains did not occur. It is possible that a mismatch in autistic and non-autistic language use/communication style impacted information transmission in the previous study but not in our less-verbal (visuospatial) task, and/or that the increased heterogeneity of our sample overshadowed any effect of neurotype.



442.294 Imitation Types in Relation to Language Skills in Young Autistic Children

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Background:

Language abilities are highly heterogeneous in autistic children, ranging from being minimally verbal to verbally fluent (Bacon et al., 2019). Previous studies have found that imitation abilities are positively related to (expressive) language abilities in autistic children (e.g., Pecukonis et al., 2019). However, imitation has often been measured via one total score, while it includes imitation of actions with objects (i.e., procedural imitation), actions without objects (i.e., gestural imitation) and imitation of spoken words (i.e., verbal imitation). Moreover, imitation can take place either in a structured context (i.e., elicited imitation) or a social-interactive context (i.e., spontaneous imitation; Ingersoll & Meyer, 2011).

Objectives:

This study examines the association between structured gestural, verbal and procedural imitation, as well as spontaneous procedural imitation, and the concurrent receptive and expressive language abilities in young autistic children.

Methods:

110 autistic children aged between two and six years ($M = 4.40$) were assessed in a mobile research van. Imitation abilities were assessed using: the Preschool Imitation and Praxis Scale as a measure for structured gestural and procedural imitation, a structured verbal imitation paradigm, and the object scale of the Unstructured Imitation Assessment for spontaneous procedural imitation. Language abilities were assessed using the Bayley Scales of Infant Development (BSID-III) for younger or less verbal children and the Clinical Evaluation of Language Fundamentals (CELF-P-2) for older children. The Snijders-Oomen Non-verbal Intelligence test (SON-R 2-8) was used to assess nonverbal cognitive abilities (NVIQ).

Results:

Bivariate correlation analyses revealed significant Spearman correlations ($p < .001$) between all imitation types, language and NVIQ. Regression analyses were conducted with imitation types as predictors of receptive and expressive language age equivalents divided by age, controlled for NVIQ, age, testing site and socio-economic status (i.e., degree of the mother). The model with only control variables had an R^2 of .57 and .54 for receptive and expressive language respectively. Imitation abilities were added stepwise to these models. For receptive language, adding structured procedural, verbal and spontaneous imitation provided the best fit ($R^2 = .75$), accounting for .14, .02 and .02 in explained variance respectively. For expressive language, the best fit was found when structured verbal, procedural and spontaneous imitation were added ($R^2 = .77$), accounting for .20, .01 and .02 respectively. Structured procedural ($p < .001$; $p = .002$) and verbal imitation ($p < .001$) were positively associated with receptive and expressive language abilities, while spontaneous procedural imitation was negatively associated ($p = .004$; $p = .02$). In a separate model, gestural imitation was positively associated to both language abilities ($p < .001$) but it did not have added value in the explained variance.

Conclusions:

Imitation abilities seem to be associated with concurrent receptive and expressive language abilities, even when controlling for NVIQ, suggesting a unique contribution of imitation abilities. Procedural imitation explained most variance for receptive language, while verbal imitation did so for expressive language, suggesting different associations for both language abilities. Gestural imitation did not have added value. Contrary to our expectations, spontaneous imitation was negatively associated to both language abilities.

442.295 Impact of Discrepancies between Parents and Adolescents Perceptions of Empathy and Social Anxiety in Self-Concept Among Autistic Adolescents

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Background: Discrepancies between adolescent and parent reports on adolescents' social functioning are common in research and clinical settings (De Los Reyes & Ohannessian, 2016). Literature suggests these reporter discrepancies may be clinically informative, with difference scores between mothers' and their children's reports of internalizing disorders being associated with youth's negative self-concept (Castagna et al., 2021), and positive parent-child relationships relating to higher self-esteem and reduced reporter discrepancies on internalizing symptoms (Treutler & Epkins, 2003). Though less well-studied in autistic populations, there is evidence that parent- and youth-informant discrepancies show consistent patterns of autistic youth reporting more positive social functioning than parents do (Lerner et al., 2012). However, it is unclear if and how such discrepancies related to autistic youth self-concept have emerged in the typically developing literature. This is especially relevant to autistic populations, who have lower self-esteem than the general population (Nguyen et al., 2020; McCauley et al., 2019), placing them at higher risk for negative mental and physical health outcomes (Trzesniewski et al., 2006).

Objectives: This study aimed to examine the relationship between discrepancies in self-and-parent-reported measures of adolescent social anxiety and empathy, and how these discrepancies impact autistic adolescents' self-concept.

Methods: Participants included 138 autistic adolescents between 10-18 years old (73.9% male, $Mage=14.07$; $SD=1.94$) and their parents who attended the UCLA PEERS® for Adolescents program. The *Social Anxiety Scale* (SAS; La Greca & Lopez, 1998) and *Empathy Quotient* (EQ; Auyeung et al., 2012), both parent- and adolescent-reported, were used to assess adolescent social anxiety and empathy skills, respectively. Adolescent self-concept was measured via self-report on the *Piers-Harris Self-Concept Scale* (PH2; Piers & Herzberg, 2002). Discrepancies were calculated as the difference between self and parent reports, with positive scores indicating that adolescents reported higher levels of traits than their parents, and negative scores indicating the reverse. A multiple regression analysis was performed to examine reporter discrepancies on measures of social anxiety and empathy as predictors of adolescents' self-esteem.

Results: Regression analysis indicated that reporter discrepancies on both the EQ and SAS significantly predicted the PH2. Specifically, a higher EQ discrepancy, where adolescents reported higher empathy than parents, was associated with higher self-esteem ($B=0.136$, $p=.033$), indicating that a strong self-perception of empathy may enhance their overall self-worth. Conversely, a negative relationship was found between parents and adolescents' perceptions of social anxiety ($B=-0.180$, $p=.001$). When parents rated their adolescents' social anxiety higher than their adolescents did via self-report, the adolescents tended to have lower self-esteem. Overall, the model accounted for 12.5% of the variance in adolescent self-esteem, $F(2,130)=10.42$, $p<.001$.

Conclusions: Overall, these findings suggest that the alignment between parent and adolescent perceptions significantly influences autistic adolescents' self-esteem. It is possible that reporter discrepancies may be reflective of broader family processes and that congruence in perceptions may foster a positive self-image among autistic adolescents. Future research should examine potential moderators of self and parent-report discrepancies and their impact on adolescent functioning.

442.296 Individual and Environmental Correlates of Attachment Security in Autistic Children

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Background: The ability of autistic children to form secure attachment relationships has been documented in several studies (Rutgers et al., 2004, for a meta-analysis). More recently, the role of sensitive parenting in the development of attachment security in autistic children has been highlighted in a meta-analysis showing an effect size of $r = .47$ (Cossette-Côté et al., 2022). However, this meta-analysis could not examine the moderating role of children's neurodevelopmental characteristics, such as severity of autistic characteristics (SAC) and developmental level (DL). Some authors have suggested that higher SAC and low DL may be associated with increased attachment insecurity (Teague et al., 2017).

Objectives: This study aims to examine the association between parental sensitivity (PS) and attachment security in autistic children; it also aims at examining whether children's SAC and DL moderate this association.

Methods: The sample comprises 41 mothers and their autistic children aged between 2 and 6 years old recruited during the COVID-19 pandemic. A 10-minute free play/snack time parent-child interaction was filmed at home by videoconference. PS was assessed with the parent-child interaction coding system for preschool and school-age children (Moss et al., 1996). Child attachment security was coded using a short 25-item version of the Attachment Behaviors Q-Set (AQS; Waters, 1995). SAC and DL were, respectively, assessed with the Childhood Autism Rating Scale 2nd Ed. interview (CARS-II; Schopler et al., 2010) and the Ages and Stages Questionnaires socioemotional 1st Ed. (ASQ-SE; Squires et al., 2011). Coders were blind to other measures' scores and showed good to excellent inter-rater reliability (PS: $r_{icc} = .86$; attachment security: $r_{icc} = .80$; SAC: $r_{icc} = .92$).

Results: Medium associations were found between attachment and sensitivity and between DL and SAC (see Table 1). Two hierarchical regressions tested the moderating roles of children's neurodevelopmental characteristics between parental sensitivity and child attachment security. Results showed non-significant main effects of PS, DL, and SAC. The interaction term of PS X SAC (see Table 2, Model 1) was significant, $b = -.105$, indicating that the association between PS and attachment security is only significant for children with a low SAC ($t = 3.02$, $p = .01$). The interaction term of PS X DL (see Table 2, Model 2) was not significant, $b = -.006$.

Conclusions: Findings are consistent with the Cossette-Côté et al. (2022) meta-analysis, showing an association between PS and child attachment security in autistic children. However, this association is observed only for autistic children with a lower SAC. Findings also indicate that DL is not associated with attachment security in autistic children. This highlights the need to consider children's severity of autistic characteristics in parent-child relationship assessments and intervention with autistic children. However, the current study is based on a small sample, thus the results should be interpreted cautiously, and future studies could benefit from larger samples and longitudinal designs.



442.297 Influence of Cross-Modal Processing on the Facial Trustworthiness Judgments of Individuals with Autism Spectrum Disorder

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Background:

People make trustworthiness judgments by briefly exposing themselves to faces, affecting social interactions. People with ASD have difficulty reading social information from faces. A characteristic not studied in individuals with ASD is the role of cross-modal processing in the perception of trust.

Objectives:

This study aimed to examine this influence on the facial trustworthiness judgments of children with ASD.

Methods:

Eighty participants were divided into two groups: Control Group ($n=40$) made up of neurotypical individuals aged 11.2 years, and ASD Group ($n=40$) made up of individuals with ASD aged 10.3 years ($CIT=89.2$). Cross-modal processing was studied using the Bouba-Kiki effect.

Participants observed 20 faces, 10 round and 10 angular. The angular ones were associated with "names-Kiki", the round ones were associated with "names-Bouba". Cross combinations of names and faces were included. Each participant answered if they "would lend their toy to the model in the photo that was called..."

Results:

The ASD Group showed greater perception of trust ($M=13.1$) compared to the Control Group ($M=10.5, p=0.02; d=0.5$), and had greater cross-modal engagement ($p=0.002$). Cross-modal processing positively influenced the trustworthiness judgments of the Control Group ($M=11.25$), compared to the ASD Group ($M=10.4; p=0.03; d=0.47$). The Control Group was 5.5 times more likely to trust faces influenced by cross-modal processing compared to the ASD Group, who did it 7.7 times less in relation to this effect ($p=0.008$).

Conclusions:

Children with ASD tend to have a higher perception of trust. However, they are not influenced by cross-modal processing regarding facial trustworthiness judgments, which reveals a different modulation when making these types of decisions.



442.298 Emotion Expression Differences in Autistic and Typically Developing Young Children in Response to Social and Nonsocial Play-Based Tasks: A Feasibility Study

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Background:

Research suggests that autistic individuals present with differences in emotion expressivity in comparison to typically developing (TD) individuals (Loveland, 2005), which might contribute to lower success in social interactions (Brewer et al., 2016). Further, autistic children seem to present differences in emotional physiological responses in relation to tasks' sociality, presenting normative patterns in non-social tasks (Nuske et al., 2013). Current literature has yet to define dimensional differences in emotional presentation, as well as whether expressivity differences are modulated by social and non-social nature of situations

Objectives:

This study aims to explore differences in facial emotion expressivity between TD and autistic young children during active engagement in social and non-social emotion-eliciting play-based tasks, and to investigate the feasibility of eliciting emotion expression through play-based tasks.

Methods:

The study included 21 autistic ($M=42.33$ months, $SD=11.16$) and 22 TD ($M=43.55$ months, $SD=10.92$) young children. Participants were administered a set of probes modified from the Laboratory Temperament Assessment Battery (Lab-TAB) Locomotor Version (Macari et al., 2018) to assess emotional response in emotionally valenced tasks designed to elicit joy and frustration.

Each task was presented twice in separate conditions: a social condition, where the examiner interacted with the child using exaggerated vocal inflection and facial expressions, and a non-social condition, where the examiner maintained a neutral vocal inflection and facial expression, and minimally interacted with the child.

Lab-TAB sessions were video-recorded and facial emotional expressivity was double coded offline by two researchers blinded to grouping and condition. Discrepancies were resolved by P.I. (1) Peak Intensity of emotion, (2) Frequency of Peak, (3) Gestalt Intensity, and (4) Frequency of Gestalt, were analyzed (see Table 1 for scoring criteria).

Results:

General Linear Models (GLM) were fitted to predict the four parameters, considering diagnosis (ASD/TD), condition (Social/Non-social Task), and Emotion elicited by each task (Joy/Frustration). Models were significant and Emotion was found to be the only significant predictor (Peak intensity: $F(7,172)=21.83, p<.001, \eta^2=0.48$; Frequency of Peak: $F(7,172)=4.06, p<.001, \eta^2=0.15$; Gestalt Intensity: $F(7,172)=7.75, p<.001, \eta^2=0.25$; Gestalt Frequency: $F(7,172)=9.70, p<.001, \eta^2=0.29$).

GLMs that then separately explored emotional valence indicated that social nature of the task ($p=.003, \eta^2=0.10$) and group designation ($p=.006, \eta^2=0.09$) were significantly related to Frequency of Gestalt in joy ($F(3,85)=0.001, p=.001, \eta^2=0.18$), with autistic children expressing joy less frequently than TD and both groups expressing joy more frequently in social tasks versus non-social. Whereas no significant GLMs were found for other behavioral codes (all $ps>.05$).

Conclusions:

The tasks were effective in eliciting the target emotions, although no significant differences were found between social and non-social conditions. when considering emotions altogether. The observed differences in the Frequency of Gestalt in joy suggest that the social nature of tasks may influence the expression of positively-valenced emotion. Future studies should investigate this finding further with a more robust sample size.



442.299 Interpersonal Brain Synchrony in Mother-Child Social Interactions in Autistic and Non-Autistic Children: An fNIRS Hyperscanning Study

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Background: Autistic children often face challenges in forming secure attachment relationships with their caregivers. Previous research, however, has shown that the sequelae of attachment security in autistic children may be similar to typically developing (TD) children, with around half of autistic children being classified as securely attached. Interpersonal synchrony reflects important aspects of real-time social relationships, encompassing not only behaviours and affective states but also biological neural rhythm, which can provide valuable insights into attachment relationships between autistic children and their primary caregivers.

Objectives: This study compared neural synchrony between mother-child dyads in school-aged children with autism and typically developing children to explore how attachment security modulates neural synchrony in both groups.

Methods: Functional near-infrared spectroscopy (fNIRS) was used to measure neural synchrony between mother-child dyads during puzzle play in the bilateral prefrontal cortices (PFC) and temporoparietal junction (TPJ). Both mother and child reported on their attachment relationship after the brain scan session. To date, 27 mother-child dyads (6 Autism, 21 TD, Mean age= 10.22±1.63 years, 44.4% male) have completed the sessions (Target: 30 for each group). In the puzzle task, the mother and child played with puzzles either independently (individual condition) or together (cooperation condition) (Figure 1A). The wavelet transform coherence (WTC) was used to estimate interpersonal neural synchrony in each dyad.

Results: In both groups and both conditions, high WTC indicated strong pairwise cohesion across most channels. A mixed effect model and subsequent contrast revealed significant differences in WTC between the Cooperation and Individual puzzle play conditions. Specifically, differences were observed strong cohesion between TPG to PFC while cooperating in the Autism group, while strong cohesion between TPG while playing individually in the TD group (Figure 1). Although the group differences were only trending towards significance due to a small sample size in one group, the TD group demonstrated a tendency of greater cohesion in mother-child dyads relative to the Autistic group. Additionally, widespread correlations between neural synchrony and attachment security were observed in the TD group (Figure 2, left). Correlations between neural synchrony and attachment security in the ASD are depicted in Figure 2, right panel, though interpretations should be tempered due to the current sample size.

Conclusions: Our preliminary analyses demonstrated that mother-TD dyads showed greater neural synchrony during cooperative puzzle play than mother-ASD dyads. The associations between neural synchrony and attachment security suggest that the relationship between mother-child attachment styles and mother-child interpersonal neural synchrony may differ across diagnosis status.

**442.300** Interpersonal Distance As Social Consequences in Adults with Typical Development with Varying Autism Spectrum Quotient: A Gaze-Contingent Study

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Background:

Interpersonal distance is an important component of complex social interactions. Proper regulation of interpersonal distance can foster effective communication, while violations may lead to discomfort or perceived intrusions. However, research on individuals with Autism Spectrum Disorder (ASD) and interpersonal distance has produced conflicting results. Clinical studies suggest that individuals with ASD violate the social distance of others. In contrast, some experimental studies found that individuals with ASD maintain a greater interpersonal distance. These discrepancies may arise from variations in experimental design. Some studies treat changes in distance as an antecedent stimulus and others as a consequence of participants' behavior. Additionally, face-to-face experimental settings may be experienced differently by typically developing individuals and ASD.

To address these inconsistencies, this study manipulated the 3-term contingency, static face (antecedent stimulus) - gaze (behavior) - approach or recede (consequence). The study will explore participants' automatic, unconscious responses to social stimuli through gaze-contingent to gain a more nuanced understanding of how interpersonal distance is regulated.

Objectives:

To examine the effects of approaching or receding stimuli as social consequences on value learning and contingency processes in individuals with varying Autism Spectrum Quotient (AQ) scores.

Methods:

The experiment will involve 80 typically developing college students. The eye-tracking task will be implemented on the Tobii Pro X3-120. Face stimuli will be sourced from the 'AIST Facial Expression Database'.

During the baseline phase, participants will freely observe two pairs of static faces. In the training phase, viewing one face (high value) will trigger approach (recede) animation, while viewing the other face (low value) will result in no change. In the final test phase, participants will again freely view the two static faces (Figure 1).

The independent variables in the experiment were the condition- the face movement direction (approach, recede) and value (high value, low value).

The dependent variables were the mean dwell time, the proportion of high-value preference, saccadic reaction time, and AQ Score. These dependent variables will be derived from eye movement data, including metrics such as fixation duration and saccadic latency.

Results:

Data is currently collected from 49 participants. After the completion of data collection, the following analyses will be conducted:

Preliminary Analyses:

1. Investigate the relationship between gender and the condition (approach, recede).
2. Analyze the relationship between mean dwell time and condition during the baseline phase.
3. Examine the relationship between SRT and condition during the training phase.

Statistical Analyses:

1. Correlate the high-value (HV) preference proportion with the experimental procedure (baseline, test).
2. Correlate AQ scores (total score and subitems) with changes in HV preference proportion.
3. Correlate AQ scores (total score and subitems) with SRT.

Conclusions:

If participants consistently prefer the high-value face that triggers distance changes, this could suggest that value learning, based on social consequences, influences comfort with interpersonal distance. If significant correlations between AQ scores and the high-value preference proportion or SRT, it suggests that autism spectrum traits influence implicit social preferences, such as comfort with interpersonal distance or responsiveness to social cues.

**442.301 Interpersonal Dynamics in Autism: Insights from Vitality Forms**

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Background:

Children with autism spectrum disorder (ASD) often face challenges in establishing effective interactions with others, with social difficulties being a core issue affecting their social adaptation. Interpersonal interactions are inherently bidirectional; thus, exploring the social cognitive deficits of children with ASD solely from their perspective does not capture the full narrative of their social challenges. Vitality forms express the subject's attitude toward others and serves as the foundation for social interaction. While previous research has identified obstacles in ASD individuals' recognition of others' vitality forms, the bidirectional nature of social interactions regarding vitality forms in ASD has not been adequately investigated.

Objectives:

This study aims to examine the ability of different groups including parents and autistic adults to recognize vitality forms in ASD, gaining a comprehensive understanding of ASD vitality forms from the perspective of social interaction's bidirectionality.

Methods:

A total of 80 participants were recruited, divided into four groups: (1) ASD parents group (AP, $n=18$, $\text{age}=38.28\pm1.64$), (2) TD parents group (TP, $n=16$, $\text{age}=37.87\pm1.25$), (3) High Autistic Traits group (HAT) ($n=24$, $\text{age}=22.08\pm2.47$), and (4) Low Autistic Traits group (LAT) ($n=22$, $\text{age}=21.82\pm2.46$). Participants completed two experimental tasks: determining whether the action goals of children (ASD vs. TD) were consistent (Aim Task: ASD condition vs. TD condition) and assessing whether the vitality forms of actions by children (ASD vs. TD) were consistent (Vitality Form Task, VF: ASD condition vs. TD condition), using sensitivity indices d' and reaction times as dependent variables.

Results:

Both the AP and TP groups demonstrated significantly higher accuracy in recognizing TD children's videos compared to ASD children's videos ($F_{(1,32)} = 8.23$, $p = 0.01$, $\eta^2 = 0.21$). In the HAT group, accuracy in the AIM task was higher than in the VF task ($F_{(1,23)} = 8.10$, $p = 0.01$, $\eta^2 = 0.26$), and accuracy for recognizing TD children's videos was significantly greater than for ASD children's videos ($F_{(1,23)} = 18.059$, $p < 0.001$, $\eta^2 = 0.44$). The LAT group also showed significantly higher accuracy in recognizing TD children's videos compared to ASD children's videos ($F_{(1,21)} = 7.68$, $p = 0.01$, $\eta^2 = 0.27$).

Conclusions:

Our findings indicate that different groups perform better in recognizing the behaviors of typically developing children, while they encounter significant difficulties in identifying the behaviors of children with ASD. This discrepancy may reflect the unique characteristics of behavioral expression in individuals with ASD. Our study indicates that even parents of children with autism do not show heightened sensitivity to ASD actions, which is consistent with previous studies that showed they could not identify cry from autistic children. The high autistic traits group also face challenges in understanding vitality forms, potentially due to exhibiting behaviors and cognitive characteristics associated with ASD. Our findings are expected to enhance the understanding of the bidirectional challenges faced by individuals with ASD and their neurotypical counterparts during interactions.

442.302 Interplay of Social Anxiety and Autistic Traits: Attention to the Eyes in Autistic and Neurotypical Children

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Background: Autistic individuals often exhibit reduced attention to the eyes with others. Individuals with social anxiety may also show avoidance of attention to the eyes, but other research reported heightened alertness and delayed disengagement in individuals with social anxiety. While many autistic individuals experience high levels of social anxiety, the interrelationships between social anxiety and autistic traits regarding attention to the eyes remain unclear. Specifically, it is unknown whether social anxiety manifests differently in attention to the eyes among autistic individuals compared to neurotypical (NT) individuals.

Objectives: This study employed an eye-tracking paradigm to investigate attention to the eyes in autistic and NT children, aiming to explore how autistic traits and social anxiety interactively modulate the attentional process to the eyes.

Methods: Forty-five autistic children (mean age = 12.31 years, $SD = 2.16$) and 42 NT children (mean age = 12.02 years, $SD = 1.70$) participated in the study. All participants completed the Social Anxiety Scale (SAS; La Greca et al., 1988), while their parents completed the Autism Spectrum Quotient—Adolescent's Version (AQ; Baron-Cohen et al., 2006). We used a Tobii Pro Fusion eye tracker to capture participants' eye movements during a gender judgment task, consisting of 60 trials. Each trial began with participants focusing on the center of the screen, followed by the presentation of a face from the Tsinghua Facial Expression Database for 3 seconds, after which they determined the face's gender. The participants' first fixation was directed to either the eyes (eye-cuing condition) or the mouth (mouth-cuing condition). We calculated the latency to disengage from the eyes after initial fixations to eyes and the latency to shift from the mouth to the eye region following initial fixations to mouth. Additionally, we assessed the eye-looking proportion. Statistical analyses were performed using linear mixed models (LMMs).

Results: When we categorized NT and autistic children based on the cutoff of SAS into high ($SAS \geq 8$) and low social anxiety ($SAS < 8$) groups, we found that autistic children with high social anxiety took longer to shift from mouth to eyes and showed a lower eye-looking proportion than the other three groups in the mouth-cueing condition ($ps < .05$; Figure 1). Subsequently, we conducted LMMs among all participants to examine the impact of AQ and SAS on these indices. We identified an interactive effect of autistic traits and social anxiety on eye-looking proportion in the mouth-cueing condition ($p = .029$) and the time taken to shift from mouth to eye ($p = .066$). Further, we divided participants into two groups based on mean AQ (73). In the high AQ group ($AQ \geq 73$), higher levels of social anxiety were associated with a reduced proportion of eye-looking in the mouth-cueing condition and a prolonged gaze shift from the mouth to the eyes ($ps < .05$; Figure 2).

Conclusions: This study suggests that eye avoidance is evident only when both high levels of autistic traits and social anxiety coexist. Autistic children with elevated social anxiety are more likely to exhibit eye avoidance compared to neurotypical children with similar levels of social anxiety.



442.304 Joint Attention and IQ Among Autistic Children: Links across Development

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Background: Research and theory suggests that an early disturbance of joint attention, and the related understanding of referential communication may contribute to differences in the development of IQ among autistic people. Between six- and twelve-months of life children incrementally develop the ability to use shifts of gaze direction, pointing and showing bids for joint attention in order to follow and initiate episodes of intentional reference in interaction with caregivers. Differences in the development of initiations and responses to bids for joint attention are an early symptom of autism that is associated with differences in social cognitive development, learning and language acquisition. Recent research also suggests joint attention symptoms may be a significant correlate of IQ differences in autism across ages. This study was designed to examine that hypothesis.

Objectives: 1) to examine concurrent and longitudinal associations between joint attention and IQ across childhood in a large sample of autistic children with and without intellectual disability; and 2) examine whether sex moderates the association between joint attention and intelligence in autism.

Methods: Longitudinal data was collected in 314 autistic children from 2-13 years of age at Visit 1 ($n = 196/118$ (m/f), $m_{age} = 3.01$ years), Visit 2 ($n = 86/53$ (m/f), $m_{age} = 5.64$ years), and Visit 3 ($n = 91/29$ (m/f), $m_{age} = 11.42$ years). Diagnoses of autism were established at Visit 1 by licensed clinical psychologists using ADOS and ADI-R, and all children were reassessed at Visits 2 and 3. Joint attention scores at Visits 1, 2, and 3 were derived from ADOS-2 items, an approach that has been utilized by others and whose factor structure was established and independently replicated. The Mullen Scales of Early Learning (MSEL) was used at Visit 1 to obtain a developmental quotient (DQ), and the Differential Ability Scales-II (DAS-II) was used to measure IQ at Visit 2 and 3.

Results: Children's joint attention skills were strongly related to their concurrent IQ scores at Visit 1 ($r(312) = .61, p < .001$), Visit 2 ($r(137) = .78, p < .001$), and Visit 3 ($r(118) = .65, p < .001$). Associations between joint attention and IQ were significantly stronger than other measures of autism symptom severity (e.g., ADOS severity scores, p 's $< .001$). Longitudinal path analyses indicated that joint attention development from Visit 1 to 3 significantly mediated IQ development across that same time period ($p = .023$). Finally, a differential relation between joint attention development from Visit 1 to 2 was found for girls compared to boys, with autistic girls demonstrating a stronger association between joint attention development and IQ outcome at Visit 3 compared to boys ($F(1,66) = 6.55, p = .012$).

Conclusions: Results of the present study indicate that joint attention in early and middle childhood is concurrently related to IQ in autistic children, and that joint attention development predicts IQ outcomes in later childhood. There is also evidence that joint attention may develop differentially for autistic boys compared to girls from age 2 to 13 years.

**442.305** Less Face Engagement, More Object Focus, and Greater Pupil Constriction Associated with Autistic Traits in Nonautistic Preschoolers

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Background: Autistic children often show reduced social attention and increased interest in non-social stimuli (Pierce et al., 2011). Eye-tracking studies reveal attentional differences in autism when processing faces and objects, especially when presented in direct competition (Unruh et al., 2016). Additionally, greater pupil constriction during visual scanning in autistic children as compared to their nonautistic peers suggests distinct visual processing strategies in autism (Anderson et al., 2006).

Objectives: This study asks whether patterns of visual attention and scanning observed in autistic children are also evident in nonautistic children with higher levels of autistic traits.

Methods: Nonautistic preschool-aged children ($N = 52$, $M_{age} = 49.25$ months, $SD = 11$) viewed images displaying arrays of five items (face, bird, car, phone, scrambled face, see Elsabbagh et al., 2013) while an SMI RED 120Hz eye-tracker recorded gaze and pupil responses. Eight different arrays were presented, each for 12 seconds. Caregivers completed the Social Responsiveness Scale, Second Edition (SRS-2, Constantino & Gruber, 2012), assessing autism-related characteristics. Participants were grouped into low or high traits groups following a median split of SRS-2 total scores. Eye-tracking analyses examined 1) face engagement as attention to faces relative to all items and 2) object engagement as attention to objects (average for phone and car) relative to all items. Face and object engagement were calculated for both total time and number of fixations. Additionally, pupil size change was calculated (stimulus minus pre-stimulus).

Results: Linear mixed models (LMM) with category (face, objects) and group (low, high) revealed significant category x group interactions for total time ($F(1,104) = 13.83, p < .001$, see Figure 1A) and fixation ($F(1,104) = 12.28, p < .001$). Follow-ups showed that as compared to the low traits group, the high traits group exhibited less face engagement for total time and fixations ($ts > 2.5, ps < .02$) and more object engagement for total time and fixations ($ts > 2.2, ps < .03$). Within groups, only the low group showed greater face than object engagement for both total time and fixations ($ts > 4.0, ps < .001$). Across the full sample, face engagement was negatively correlated with SRS-2 scores ($rs > -.32, ps < .02$), while object engagement was positively correlated with SRS-2 scores ($rs > .28, ps < .02$; see Figure 1B). For pupil analysis, the high traits group showed greater constriction relative to baseline during visual scanning than the low traits group, $t(50) = 2.24, p = .030$, and overall, pupil change was negatively correlated with SRS-2 scores, $r(50) = -.315, p = .024$ (see Figure 2).

Conclusions: The current study found less face engagement and more object focus in a sample of nonautistic children with higher levels of autistic traits, extending past findings with autistic children (Unruh et al., 2016). Additionally, greater pupil constriction from baseline observed in the high traits group suggests that altered visual processing strategies could reflect variation in autistic traits more broadly (Anderson et al., 2006). These findings underscore the high potential of visual attention and scanning to offer insights into the broader continuum of autistic traits.



442.306 Live Social Interaction Joint-Attention Task for Autistic Adolescents

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Background:

Eye gaze cues (e.g., holding and shifting gaze) provide important non-verbal communicative signals that organize social interactions. Autistic individuals have difficulties understanding eye gaze cues, which was originally observed in infants during episodes of joint attention (i.e., shared attention to objects with other people (Mundy, 1994). Importantly, these difficulties persist beyond infancy into adolescence and adulthood (Riby et al, 2013; Whyte & Scherf, 2017; Griffin & Scherf, 2020). A concern about much of this work is that it uses paradigms that do not involve social partners, which may alter the way gaze shifts are perceived and understood (Laskowitz et al, 2020).

Objectives:

Here, we present a new task that evaluates sensitivity to perceiving, understanding, and using eye gaze cues in the context of a live social interaction. It was developed as part of a battery of tasks to evaluate the effectiveness of a psychosocial serious game intervention to improve sensitivity to eye gaze cues in autistic adolescents (Scherf et al, 2018).

Methods:

The task is a live joint attention task that is age-appropriate for adolescents. A researcher sits directly across a small table from the participant and leads the social interaction. On each trial, the researcher places two objects on the table (e.g., two cups), verbally describes a context in which they like to use cups (e.g., drinking coffee in my office), executes a shift of gaze while saying, "that one is my favorite," and asks the participant to pick up the favorite object and place it in front of them. The task was executed with different sets of objects before and after the intervention. Both accuracy and visual attention were measured.

Results:

42 autistic adolescents were randomized to either the intervention or placebo control groups for a randomized controlled trial. At baseline assessment, participants in both groups completed the live joint attention task significantly above chance levels (Control $M = .75$ ($SD = .24$), Intervention $M = .68$ ($SD = .29$)). However, the distribution of scores indicated both ceiling and floor effects. Full scale IQ was positively associated with performance, $r(40) = 0.44$, $p = .002$. Overtime, these scores were most stable in the control group ($ICC = 0.65$, 95% CI 0.12 – 0.86) and more variable in the intervention group ($ICC = 0.45$, 95% CI -0.30 – 0.77).

Conclusions:

The results suggest that many autistic adolescents were able to perceive and understand the eye gaze cues in the live joint attention task. Increasing the difficulty of the task may be necessary to avoid ceiling effects, particularly for individuals who also have particularly high IQ. This is the first iteration of a task to help fine-tune our understanding of autistic adolescents' ability to use eye-gaze cues in live social interactions.

442.307 Non-Autistic College Students' Responses to the Social Behavior of a Fictional Autistic Peer

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Background: Autistic college students commonly experience strained social relationships with non-autistic peers (e.g., Locke et al., 2010). This is often attributed to the autistic individual's social skills differences, which are central to a diagnosis of autism (American Psychiatric Association, 2022). Yet, how non-autistic peers receive and respond to autistic individuals is also predictive of social interaction outcomes (e.g., Sasson et al., 2017). Many researchers have studied non-autistic people's responses to autistic peers (e.g., White et al., 2019), but to our knowledge, no existing study has evaluated potential mediating effects of involved constructs.

Objectives: The present study investigated the relations between non-autistic college students' perceptions of a hypothetical autistic individual and the non-autistic peers' affective responses, attitudinal responses, and willingness to engage socially with that hypothetical peer.

Methods: 469 non-autistic college students enrolled in an introductory psychology course independently reviewed a written vignette (adapted from Underhill et al., 2019) depicting a scenario in which they were in the same college course as a classmate who demonstrated characteristics of autism. Non-autistic participants then responded to questions assessing their in-the-moment affect responses, beliefs about, and attitudes and behavioral intentions toward the hypothetical vignette character. Additionally, they completed measures assessing their previous experiences with autistic people, their social desirability, and their demographic information. We hypothesized that the relation between predictor variables: non-autistic peers' quality of previous contact, perceptions of the hypothetical peer's control over their behavior, and perceptions of the hypothetical peers' responsibility for their behavior and criterion variables: attitudes about autism and willingness to engage with autistic individuals, would be mediated by the peers' affective responses to autistic individuals.

Results: Results indicated that positive affect mediated the relations between quality of previous contact and positive attitudes and willingness to engage, whereas there was no association between perceived controllability or perceived responsibility and positive affect, positive attitudes, or willingness to engage (Figure 1).

Conclusions: These results demonstrate that having more positive previous experiences with autistic individuals and more positive in-the-moment affective responses toward an autistic individual are associated with more positive non-autistic peer perceptions and behavioral intentions. Thus, future interventions aiming to improve interactions between autistic and non-autistic people may benefit from facilitating positive interactions between the social partners to improve the likelihood that non-autistic people will be willing to have positive perspectives of, and more likely to engage with, autistic peers. Continuing to investigate the mechanisms facilitating or hindering non-autistic engagement with autistic peers can shift the onus from autistic individuals to both social partners. Such intervention work should align with neurodiversity perspectives promoting understanding and acceptance of the social presentations of autistic people.

**442.308 Patterns of Social Difficulties and Anxiety in Autism**

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Background: Autistic youth present with diagnostic difficulties navigating social interactions and maintaining relationships¹. Additionally, as many as 40% of autistic youth may exhibit clinically significant anxiety². Importantly, parents and youth frequently do not agree on measurements of internalizing symptoms in youth, and inclusion of multiple reporters is critical³. In non-autistic youth, anxiety is understood to derive, in part, from difficulties with social/emotional reciprocity and parent-reported social difficulties⁴. Research examining this model in autistic youth is inconsistent: self-reported peer victimization is associated with self-reported anxiety symptoms in autistic youth⁵, though self-reported social difficulties alone do not account for the development of parent-reported social anxiety⁶. Parent-reported anxiety predicts the development of peer relationships⁷ and autistic traits⁸, though research does not support the inverse model⁹. The proposed study incorporates caregiver-, self- and teacher-reports to examine the impact of social difficulties on anxiety in autistic youth.

Objectives:

1. Examine association between social difficulties and anxiety, controlling for social cognitive differences, in single informant (caregiver) model
2. Explore interrater agreement on anxiety and social difficulties in autistic youth
3. Examine association between social difficulties and anxiety across informant ratings of anxiety

Methods: Autistic youth ages 8 -15 ($n = 67$) and caregivers were recruited as part of an ongoing multi-site, randomized clinical trial. Youth (age $M=10.89$, $SD=1.55$) were predominantly male assigned at birth (70.1%), White/Caucasian (79.1%), with average cognitive ability (WASI-II FSIQ: $M=103.04$, $SD=17.98$) Measures included SRS-2⁹ (Social Cognition subscale); Strengths and Difficulties Questionnaire¹⁰ (SDQ-Caregiver; SDQ-Teacher); Screen for Child Related Anxiety Disorders¹¹ (SCARED-Caregiver; SCARED-Self); and School Anxiety Scale¹² (SAS-Teacher); collected at a single timepoint.

Results:

Regarding Aim 1, caregiver ratings were examined with six partial correlations^a controlling for social cognitive difficulties (SRS-2): social difficulties were significantly related to all SCARED domains (Table 1).

Regarding Aim 2, Wilcoxon signed-rank tests indicated no significant differences between standardized (z -score) caregiver/child/teacher-reported total anxiety or social anxiety (SCARED, SAS; $p>.05$). Paired-samples t -test indicated no difference between caregiver/teacher reported SDQ-Peer Problems ($p=.112$).

Regarding Aim 3, ten partial correlations^a were conducted between caregiver/teacher-reported SDQ-Peer Problems and caregiver/self/teacher-reported Total Anxiety and Social Anxiety, controlling for social cognitive difficulties (SRS-2). Nonsignificant weak correlations were noted between caregiver-reported SDQ-Peer Problems and SAS-Teacher Total Anxiety ($r = -.25$, $p=.225$), as well as with SCARED-Self Social Anxiety ($r = -.25$, $p=.225$). Overall, SDQ-Peer Problems were not significantly related to reported anxiety across informants (remaining partial $r < .20$, $p > .05$).

Conclusions: Findings contribute to our understanding of social difficulties and anxiety in autism. Within caregiver ratings, social difficulties are related to anxiety even when controlling for social cognitive differences associated with an autism diagnosis. Further, while no differences were found between reporters, social difficulties were not related to anxiety across reporters. Lack of agreement across raters reflects prior work examining social difficulties and teacher-reported anxiety in non-autistic youth¹², and underscores the importance of including multiple informants in clinical research. Overall results demonstrate value of work targeting social difficulties (i.e., social skill interventions), particularly those which support youths' self-directed social development, which may impact overall mental health.



442.309 Predicting Vocalizations during Peer Social Contact for Children with ASD in Inclusive Preschool Classrooms
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Background: Children with ASD commonly exhibit challenges with language and social interaction. Prior research has indicated reduced vocalization rates during classroom social contact among children with ASD. However, it is unknown whether these difficulties are influenced by overall vocalization rate, overall social contact with peers, or both. Understanding the social experiences of children in inclusive preschool classrooms with objective measures may shed light on how such differences emerge.

Objectives: Explore predictors of preschoolers' frequency of vocalizations per minute in social contact, including overall proportion of classroom time in social contact and overall vocalization frequency per minute of classroom time, among children with ASD, developmental disabilities (DD), and typical development (TD).

Methods: Participants were 108 3-5-year-old preschoolers (35 ASD, 38 DD, 35 TD) in 12 inclusive classrooms. Approximately monthly, children wore vests with Ultra-Wideband Radio Frequency Identification (RFID) tags to record their movement and a LENA audio recorder to record their vocalizations during the school day ($M=123$ minutes per observation). Child position/orientation was used to identify moments of social contact with peers (within 2 meters and approximately face-to-face). Vocalizations lasted ≥ 50 milliseconds and ended if interrupted by silence or noise lasting ≥ 300 milliseconds. Multilevel models (observations nested in children nested in classrooms) predicted vocalization frequency during social contact from log-transformed, child-centered proportion of classroom time in social contact and child-centered overall vocalization frequency with interaction terms quantifying how these associations varied by group (ASD, DD, TD).

Results: Children with TD vocalized in social contact at a mean rate of 3.25 vocalizations per minute. Controlling for other predictors, neither autistic children nor children with DD significantly differed from the TD group in their mean vocalization frequency in social contact ($p_{ASD} = .086$; $p_{DD} = .386$; $\alpha = 0.01$). Greater time spent in social contact was associated with increased vocalization frequency for children with TD ($p < .001$), but interaction effects indicated that this relationship was weaker for autistic children ($p = .003$) and children with DD ($p = .002$) than children with TD. Greater overall vocalization frequency in class was associated with increased vocalization frequency for children with TD ($p < .001$), and interaction effects indicated that this association was also positive for the ASD and the DD groups ($p_{ASD} = .049$; $p_{DD} = .513$; **Table 1 & Figure 1**).

Conclusions: Controlling for the influence of overall social contact and vocalization frequency, no differences were observed in the vocalization rate in social contact between children with ASD and other children. Children with TD who spent more time in social contact tended to vocalize more often during social contact, yet this association was nearly absent for children with ASD and DD. In contrast, children with ASD, DD, and TD all showed positive associations between their overall classroom and social contact vocalization frequencies. Time spent in social contact with peers appears to have less influence on how frequently children with ASD and DD vocalize in social contact, highlighting the need for interventions targeting the communicative quality of social interactions for neurodivergent children.



442.311 A Qualitative Exploration of the Range of Coping Strategies Used to Compensate/Camouflage in Social Situations: A Framework Analysis with Data from 342 Autistic and Non-Autistic Adults in Hong Kong

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Background: Current conceptualisations of the coping strategies used to compensate for social difficulties or increase social acceptance in autism stem from Western research (Hull et al., 2017; Livingston et al., 2019). However, social conventions (e.g., expectations of socially acceptable behaviours) and socialisation goals are culture-dependent, and potentially shape differences in the development and use of social coping strategies. Taking a broader sociocultural perspective, growing research in the East has centred on masking and camouflaging, here referred to as shallow compensation. There remains a lack of exploratory qualitative research using open-ended questions to investigate a wider range of social coping strategies (i.e., more flexible and proactive strategies than just shallow compensation) beyond Western contexts.

Objectives: This qualitative study aimed to broadly explore various strategies used by autistic and non-autistic adults in Hong Kong to cope in social situations, ranging from behavioural and cognitive to environmental-mediated processes.

Methods: We extended Livingston et al.'s (2019) methodology to a Hong Kong convenience sample. Participants were 69 autistic adults, 50 self-identifying autistic adults (who did not have a formal diagnosis), and 223 non-autistic adults aged 18 to 72 years ($M = 26.2$, $SD = 9.70$; with 62% identified as females). They completed an online survey comprising open-ended and semi-open questions on their experiences of using social coping strategies, and standardised self-report questionnaires measuring autistic traits and cultural orientations, as part of a larger cross-cultural study. Framework analysis was conducted to identify themes and subthemes that represent various social coping strategies.

Results: Five superordinate themes were identified: 1) 'regulate behaviours to meet social functions', which involves suppression and enactment of behaviours to avoid social faux pas and/or display social interest; 2) 'information-seeking for social reasoning', which includes both explicit (e.g., asking directly) and implicit (e.g., observing for verbal and non-verbal cues) sources of information to reason about others' inner states via non-social cognitive means; 3) 'cognitive reappraisal' ('a mental game'), such as adjusting expectations and applying self-compassionate thinking in social situations; 4) 'remove interpersonal stressors' through full/partial absence from a social situation; and 5) 'seek person-environment fit' through attempts to select or create an optimal environment and play to one's strengths in a setting, to promote positive social experiences. All themes and subthemes were shared between autistic and non-autistic people, and largely mapped to the strategy repertoire reported by Livingston et al. (2019). We additionally found cognitive reappraisal to be a novel group of strategies that is conceptually distinct from other strategies identified in previous Western findings. More specific cultural variations in the 'how-to' (e.g., more indirect ways for applying a strategy), rather than 'what kinds' of strategies, were observed within subthemes.

Conclusions: This is the first study to report qualitative findings on the repertoire of social coping strategies from a non-Western sample. The findings will inform a cross-culturally applicable conceptual framework for social coping strategies in autism, and our subsequent development of a new comprehensive questionnaire measure of social coping strategies.

442.312 Reappraising Social Attention Tasks in Autism Cognition Research: A Pathway to Neurodiversity-Centered Revision

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Background: Cognitive differences are central to autism. While prevailing theories, such as those regarding social attention, often frame autistic individuals as deficient, there is a growing reflection on whether this is an equitable and accurate understanding of autistic cognition. Importantly, experimental tasks were infrequently designed by or with autistic individuals and did not adequately consider their unique needs and perspectives. Consequently, these tasks may fall short of capturing both the weaknesses and strengths of autistic cognition. For example, evidence for diminished attention to the eyes and social stimuli in autistic individuals is inconsistent, and stimuli are usually passively viewed and not entirely ecologically valid.

Objectives: We approach this issue of inequitable autism cognition research by systemically and critically reviewing prevailing cognitive experimental tasks used in autism research. This first report focuses on critically reappraising experimental tasks pertaining to social attention by identifying inequities in the tasks and exploring their impact on autistic individuals and our understanding of autism.

Methods: We conducted an integrative umbrella review in PsychInfo, MedLine, Embase, Cochrane Database of Systematic Reviews, and Web of Science Core Collection (see PRISMA flowchart, Fig. 1) to identify prominent experimental paradigms. An autistic researcher (the first author) reappraised the paradigms via engagement with other autistics in a modified Delphi process, targeting (1) barriers to expected interaction with stimuli and discomfort during measurement; (2) ecological validity using the Multidimensional Assessment of Research in Context (MARC) Tool; (3) potential misinterpretation of instructions by participants and of behavioral findings by researchers; and (4) autistic research priorities.

Results: After screening, 12755 task mentions in the included reviews were extracted, of which 774 were related to social attention. Most such studies used eye-tracking methods and social stimuli (Table 1). Reappraisal from the lead autistic researcher led to concerns with (1) sensory barriers related to passive viewing of stimuli that were not considered for task execution and data analyses (e.g., screen brightness, pixilation, color contrast); (2) questionable ecological validity, further differentiating stimuli from real-life interactions (Table 1); and (3) while specific experimental instructions were rarely reported, researchers assumed that a lack of visual attention inherently entails reduced social attention. To improve ecological and interpretation validity, experiments need to go beyond passive viewing by integrating attention tracking in naturalistic, accessible interactions. Moreover, research must incorporate non-visual modalities, as autistic individuals can be socially engaged without looking at a social target. These results, research priorities, and potential task revisions will be further shaped by the ongoing Delphi process with an autistic focus group. Full results will be presented at the conference.

Conclusions: Through engagement with other autistic people in a critical Delphi process, critiques of social attention tasks in autism research are being enhanced and revisions proposed. For example, research in verbally-communicative populations could incorporate qualitative reports in addition to eye tracking measures, in sensory-friendly real-time interaction. Ultimately, this study strives to contribute to the wellbeing of autistic individuals and the community by reshaping the landscape of autism cognition research to authentically reflect the lived experiences of autistic individuals.



442.313 Relations between Social Camouflaging and Self-Assessment Accuracy in Cognitive and Social Cognitive Domains

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Background: Despite extensive research on social cognition in autism, few studies have examined alignment between assessments of one's own social skills and external measures of social ability (i.e., self-assessment accuracy; Harvey & Pinkham, 2015). Prior research on self-assessment accuracy in autism has found evidence for both overestimation and underestimation of social cognitive ability (DeBrabander et al., 2021). Variability in social camouflaging, or the employment of strategies to mask autistic behaviors (Hull et al., 2017), may explain these heterogeneous findings and influence links between misestimation and well-being. Camouflaging, autistic-like traits, and mental health are related in the general population (O'Loghlen et al., 2024), but no studies have examined how camouflaging influences self-assessment accuracy.

Objectives: We examined how variability in camouflaging impacted the relation between actual and self-assessed performance on cognitive and social cognitive tasks.

Methods: U.S. adults from the general population ($N=202$; average age 39.73y; 83 male, 114 female, 5 non-binary) completed an online survey. Participants completed a face-based social cognitive task (Reading the Mind in the Eyes; Baron-Cohen et al., 2001a), a story-based social cognitive task (Hinting Task; Corcoran et al., 1995), and a math test as a non-social control. Additionally, participants completed measures of social camouflaging (Camouflaging Autistic Traits Questionnaire [CAT-Q]; Hull et al., 2019), autistic traits (Autism Quotient; Baron-Cohen et al., 2001b), social anxiety (Social Interaction Anxiety Scale; Mattick & Clarke, 1998), social motivation (Mind Reading Motivation; Carpenter et al., 2016), general self-monitoring (Snyder, 1986), depression (Kroenke et al., 2001), and loneliness (Hughes et al., 2004).

Results: CAT-Q scores significantly moderated the relation between actual and self-assessed performance on the face-based social cognition task, even after controlling for age, gender, autistic traits, social anxiety, social motivation, and general self-monitoring ($F(1,192)=5.69, p=.018$).

Moderating effects were strongest for the CAT-Q compensation subscale, which assesses strategies to compensate for social difficulties (e.g., practicing facial expressions). Johnson-Neyman analysis indicated two inflection points such that low compensators showed a strong positive correlation between actual and perceived ability (i.e., high self-assessment accuracy) with the correlation becoming non-significant and then negative as compensation increased. Compensation also moderated links between underestimation and mental well-being (loneliness: $F(1,196)=4.20, p=.042$; depression: $F(1,196)=2.96, p=.087$), such that greater underestimation of performance related to negative outcomes only for high compensators. These moderation effects were present even though compensation scores were not related to actual or estimated performance ($r_s < .1$). Camouflaging did not moderate relations between actual and self-assessed ability on the math test or the story-based social cognitive measure.

Conclusions: Social camouflaging impacted relations between actual and self-assessed performance on a face-based social cognitive task, but not a story-based social cognitive task or a non-social control task. For the face-based task, the ability of individuals to correctly estimate their scores was significantly diminished at higher levels of camouflaging, even though the scores themselves were not impacted. Although the current study cannot identify the mechanisms driving this moderation, future research should use more interactive measures with clinical populations to pinpoint the potentially bidirectional factors linking increased camouflaging to difficulties gauging social success.

442.314 Relationship Closeness and Loneliness: Predictors of Subjective Wellbeing in Autistic Adults

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Background: According to the homeostatic theory of Subjective Wellbeing (SWB) an individual's SWB is maintained within a positive homeostatic set-point range (70- to 90-points on a scale of 0-100) that helps to protect against adverse mental and physical health outcomes. Homeostatic maintenance is supported by putative *buffers*, such as feeling socially connected through close relationships. Autistic individuals can have difficulty establishing close social relationships, which may increase loneliness and interfere with the homeostatic maintenance of their SWB. Given that lower SWB is found among autistic people compared to the general population, it may be useful to examine the potentially mediating role of social relationships in the SWB of autistic individuals.

Objectives: To examine the homeostatic theory of SWB in autistic adults, by exploring the effect of loneliness and relationship closeness on SWB.

Methods: We conducted a cross-sectional, quantitative study of 170 autistic adults ($M_{age}=30.59$, $SD=9.45$). Of our sample, 86 (50.6%) were assigned male at birth, 81 (47.6%) assigned female at birth, and three participants did not specify. Participants completed an online survey between December 2023 and March 2024 on measures of autistic traits (Social Responsiveness Scale Second Edition), relationship closeness (Unidimensional Relationship Closeness Sale), loneliness (UCLA 3-item), and SWB (Personal Wellbeing Index-Adult).

Results: On average, our sample of autistic adults scored low SWB ($M=48.89$, $SD=20.84$); 82.3% scored below the positive range (<70 points) with 50% scoring <50-points. A stepwise regression analysis revealed that at step one, age and assigned sex significantly predicted SWB $F(2,167) 3.58$, $p<.05$, $\eta^2=0.04$. At step two, autistic traits significantly predicted SWB, $F(3,166) 6.775$, $p<.001$, $\eta^2=0.08$. At step three, relationship closeness significantly predicted SWB, $F(4,165) = 12.42$, $p<.001$, $\eta^2=0.13$. In the fourth step, loneliness significantly predicted SWB, $F(5, 164) = 14.42$, $p<.001$, $\eta^2=0.15$. This model explained 31% of the variance in SWB ($R^2=0.31$, $p<.001$), with relationship closeness predicting ($b=.35$, $p<.001$), loneliness ($b=-.30$, $p<.001$), autistic traits ($b=-.27$, $p<.001$), and assigned sex at birth ($b=-.16$, $p<.05$).

Conclusions: Our results suggest that close relationships and loneliness are related to lower SWB in autistic adults, consistent with the homeostatic theory of SWB. Consistent with previous research, our sample of autistic adults' mean SWB score was well below the positive range expected based on adult population norms. Concerningly, our sample's very low SWB scores suggest that autistic adults are at high risk of homeostatic defeat. Our findings suggest relationship quality as an important factor in establishing and maintaining SWB among autistic adults, and we recommend that interventions target relationship support to help autistic people build and maintain strong close relationships and reduce loneliness to protect SWB.

442.315 Revisiting "Empathic Accuracy" across Autistic and Non-Autistic Adults Using a Newly Developed Cross-Neurotype Empathic Accuracy Task

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Background: Autistic people's social-communication difficulties have been understood through a deficit-based lens. The Double Empathy Problem (DEP) theory posits that social misunderstanding occurs bidirectionally between autistics and non-autistics. However, there lacks cognitive-level empirical examinations of DEP predictions. Cognitive empathy (i.e., inferring others' feelings) and affective empathy (i.e., experiencing others' feelings) support social-communication. It is unclear how these empathic capacities are dynamically impacted by neurotype (mis)alignment. **Objectives:** To examine how cognitive and affective empathy depend on different neurotype-pairing contexts using a revised empathic accuracy task.

Methods: We developed a cross-neurotype version of the empathic accuracy task (cnEAT). We recorded autistic and non-autistic adult narrators recounting sad and happy autobiographical events. Afterwards, the narrators viewed their videos and retrospectively rated time-series changes in their *emotional intensity* along a continuous scale from *no emotion* to *very strong emotion*.

In this pilot study, we employed a 2 (narrator neurotype: autistic vs. non-autistic) x 2 (participant/perceiver neurotype: autistic vs. non-autistic) design. The pilot sample included 60 autistic (30 men, 30 women, $M_{age}=34.9$ yrs) and 60 non-autistic (30 men, 30 women, $M_{age}=36.2$ yrs) North American adults recruited via Prolific. Each participant watched 4 emotional videos featuring 2 autistic and 2 non-autistic narrators, each narrating either a sad or happy event. Participants were blind to the video emotion labels and the narrators' neurotypes. Participants only watched narrators of the same gender. To measure cognitive empathy, while watching, participants continuously tracked the narrator's emotional intensity using the same scale the narrators used. To measure affective empathy, they reported how happy or sad each video made them feel on a 7-point Likert scale. For each video, we calculated Pearson's correlations between each participant's rating and the narrator's own (gold-standard) rating time-series. These coefficients, indexing cognitive empathy, were compared using mixed ANOVAs for happy and sad videos separately. A series of *t*-tests assessed how affective empathy differed across participant-narrator neurotype pairings.

Results: For cognitive empathy of happiness, a participant-by-narrator neurotype interaction approached significance, $F(1, 97)=3.71, p=0.057, \eta_p^2=0.04$. Pairwise comparisons revealed that non-autistic participants were less accurate when rating autistic than non-autistic narrators, $t(97)=-2.38, p=0.019$. For sadness, there was a main effect of participant neurotype, $F(1, 99)=5.92, p=0.017, \eta_p^2=0.06$. Non-autistic participants showed greater accuracy than autistic participants across sad videos, $t(99)=2.53, p=0.013$.

For affective empathy, non-autistic participants felt less happy when viewing autistic than non-autistic narrators recounting happy events, $t(118)=-5.63, p<0.001$. Within autistic participants, they felt sadder when watching autistic than non-autistic narrators recounting sad events, $t(117)=4.53, p<0.001$. Comparing between autistic and non-autistic participants viewing the autistic narrator, autistic participants felt sadder, $t(117)=2.00, p=0.048$.

Conclusions: These preliminary findings partially support the DEP theory predictions. Although non-autistic participants were more accurate in inferring sadness, they may struggle with recognizing and relating to the happiness of autistic narrators. Importantly, autistic participants interpreted the emotions of autistic and non-autistic narrators equally as accurately and related to the sadness of autistic narrators more strongly. These observations challenge longstanding assumptions of autistic "lack of empathy" and guide future research on context-dependent features of autistic social cognition.



442.316 Self-Regulation Processes Underlying Social Motivation Differences in Children with ASD: The Influence of Social Context

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Background: Autism spectrum disorder (ASD) is a prevalent neurodevelopmental condition that includes differences in social communication and the presence of restricted, repetitive interests and behaviors. Considerable research supports the role of disrupted social motivation processes in atypical social development in ASD. Separately, research suggests that individuals with ASD experience increased stress reactivity to, and behavioral avoidance of, social stimuli, and also demonstrate pervasive deficits in self-regulation across functioning domains.

Objectives: This project makes a novel contribution to these literatures by examining the relationship between both cognitive and emotional self-regulation and social motivation in children with and without ASD (ages 5-8 years). Based on the high prevalence of sensory processing differences in ASD and the large sensory demands present in most social interactions, this study also considered the impact of sensory dysregulation in both self-regulation and social motivation. This was accomplished via two studies.

Methods: Study 1 (N=115) utilized parent report to assess these constructs in children with ASD with a range of language and academic abilities compared to an age- and gender-matched sample of typically developing children. Study 2 (N=14) assessed the feasibility of examining these same constructs directly through the use of innovative laboratory techniques. Specifically, this study examined the impact of social background noise on cognitive dysregulation and autonomic regulation, and how the effects of noise on these processes related to social motivation in a subsample of children from Study 1. Additionally, autonomic reactivity and regulation were measured within a naturalistic 360° video social environment and then related to general and task-specific measures of social motivation.

Results: Study 1 results suggest greater sensory and self-dysregulation and lower social motivation in ASD compared to controls. In addition, significant relationships were found between measures of cognitive dysregulation, emotion dysregulation, and social motivation. Importantly, cognitive dysregulation emerged as a significant mediator in the relationship between sensory dysregulation and social motivation in the ASD group. Study 2 results strongly support the feasibility of using wearable autonomic sensors and 360° video in young children with and without ASD. Additionally, measures of autonomic regulation significantly related to parent report of emotion dysregulation and sensory dysregulation, providing preliminary evidence for concurrent validity of these measurement approaches. Task-based social motivation was also significantly related to autonomic arousal during the 360° video and during the EF tasks paired with social noise.

Conclusions: Together, these studies' findings support continued investigation of these constructs in a larger laboratory-based study. This project has important etiological and intervention implications. Specifically, this work carefully investigated mechanisms in the development of social symptoms in ASD and found similar relationships across methodologies. These self-regulatory mechanisms may be important targets to investigate in intervention research and clinical practice to improve both the internal experience of individuals with ASD and their social development. Additionally, this work supports the importance of considering and adjusting sensory components of social environments to promote social engagement.

442.317 Social Anxiety and Stress Responses in Autistic Children and Adolescents: Integrating Multi-Informant and Multilevel Assessments

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Background: Social anxiety and social stress are common in neurodevelopmental conditions. While these aspects have been studied using various methods, no research yet integrated multi-informant assessments of social anxiety (i.e., parents, participants) and different components of social stress responses (subjective, behavioral, physiological). Moreover, comparing groups with different neurodevelopmental conditions using the same measures, allows to identify their respective strengths and weaknesses.

Objectives: The aim was to investigate social anxiety and responses to social stress in autistic children and adolescents compared to non-diagnosed (ND) peers and to another clinical comparison group, precisely Specific Learning Disorder (SLD).

Methods: Two studies were conducted. Study 1 included 280 participants aged 8 to 16 years: 60 autistic without intellectual disability (ID), 70 with SLD, and 150 ND peers matched for age, sex, and IQ. Study 2 involved 55 participants: 15 autistic without ID, 15 with SLD, and 20 ND. The sample was predominantly male. In both studies, participants performed the Trier Social Stress Test (TSST), requiring them to prepare and give a public speech to an unresponsive audience. Study 1 examined behavioral (quality of speech) and subjective (valence, arousal, perceived competence, and worries) aspects of social stress. Subjective experiences were evaluated before and after the speech using self-report measures. Study 2 expanded upon the first study by measuring physiological responses to social stress continuously through electrocardiogram. Heart rate and heart rate variability (HRV) were considered as measures of adaptive emotional regulation. Social anxiety was investigated using reports from both parents and children with different questionnaires in both studies.

Results: Regarding the various components of social stress, autistic children and those with SLD received lower scores for public speech quality (behavioral aspects) than ND individuals, $F(2, 277)=12.91, p<.001$. Concerning subjective responses, linear mixed effects models revealed a significant interaction between Time (before and after the task) and Group (autism, SLD, ND) for arousal, $F(2,277)=3.38, p=.03$, and perceived competence, $F(2,277)=3.76, p=.02$. Pairwise comparisons showed that autistic participants reported lower arousal and higher perceived competence than ND, while those with SLD reported lower perception of competence (Figure 1, panel A). As concerns autonomic responses, after controlling for gender, the interaction between Time and Group was statistically significant for heart rate, $\chi^2(df=6)=15.61, p=.02$, and for HRV index (RMSSD), $\chi^2(df=6)=13.42, p=.03$. Autistic participants exhibited decreased cardiac reactivity across the TSST compared to SLD and ND individuals (Figure 1, panel B). As for social anxiety, ANOVAs showed that parents of autistic participants and those with SLD reported higher scores in their children than parents of ND peers, $F(2, 277)=16.14, p<.001$. However, no differences emerged from participants' self-reports, $F(2, 277)=.50, p=.60$.

Conclusions: Our findings show unique response patterns within each group, confirming that the combined investigation of social anxiety and social stress responses offers valuable insights for research and clinical practice. Studying these phenomena in a multidimensional way is crucial, as discrepancies in social stress experiences and anxiety symptoms during daily life can provide useful information for treatment in autism. Indeed, tailored interventions based on individual characteristics should address socio-emotional support.

**442.319 Social and Non-Social Facets of Positive Emotionality in Neurodiverse Preschoolers**

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Background:

Positive emotionality (PE) is thought to be diminished in children with autism, but evidence is conflicting and evidence is sparse regarding the methods and context in which it is evaluated. Considering the importance of positive emotions in social and cognitive development and overall well-being, improving our understanding of PE in autism and other neurodevelopmental conditions (NDC) and its links with core developmental characteristics has important theoretical and clinical implications.

Objectives:

To examine (1) the latent structure of PE in preschoolers with and without autism using a multi-method approach involving parent report of temperament and direct observation of behavioral and physiological emotional reactivity during induction probes and (2) the associations between components of PE and autistic traits, verbal and nonverbal cognitive abilities, and adaptive functioning.

Methods:

Participants included preschoolers with autism (ASD; $n=73$; mean age=58.11 months), neurodevelopmental conditions (NDC; including developmental delays, ADHD, anxiety, etc.; $n=48$; mean age =60.82 months), and typical development (TYP; $n=23$; mean age =63.47 months). Peak expression of PE and concomitant changes in physiological arousal (electrodermal activity, EDA) were assessed during induction tasks adapted from the Laboratory-Based Temperament Assessment Battery-Preschool (Lab-TAB). Parents completed four PA scales from the Children's Behavior Questionnaire (CBQ), which capture PE in social and non-social contexts: Approach/Positive Anticipation, Low-Intensity Pleasure, High-Intensity Pleasure, and Smiling/Laughing. Outcome measures included autistic traits (SRS-2), nonverbal IQ (MSEL/DAS), language (PLS-5), and adaptive functioning (VABS-II) in social and communication domains.

Results:

Principal component (PC) analysis of the behavioral, physiological, and parent-reported indices revealed two PCs, expression of PE in social contexts (PE-S), and in non-social contexts (PE-NS). PE-S was lower in the autism than in the TYP group ($p=.028$), but the autism and NDC groups were similar ($p=.682$). PE-NS was comparable in the autism and TYP groups ($p=.275$), but lower in the autism than in the NDC group ($p=.006$). Multiple linear regressions indicated that higher PE-S was significantly associated with lower SRS-Total scores ($\beta=-0.47, p<.001$) and higher Vineland Communication ($\beta=0.34, p<.001$) and Vineland Socialization ($\beta=0.41, p<.001$) scores. Higher PE-NS was significantly associated with higher NVIQ ($\beta=0.16, p=.05$), PLS-5 language ($\beta=0.19, p<.05$), and Vineland Socialization ($\beta=0.20, p=.014$) scores.

Conclusions:

The multimethod, multi-level approach identified social and non-social facets of positive emotion in neurodiverse preschoolers as previously demonstrated in typically developing young children. PE in social contexts tracks with lower autistic traits and higher adaptive socialization and communication skills, while PE in non-social contexts was associated with higher cognitive, language, and social skills. PE is related to important behavioral dimensions in neurodiverse preschoolers, with implications for learning, intervention, and education.

442.320 The Broader Autism Phenotype (BAP): Exploring the Relationships between Friendship Quality and BAP Traits Amongst Neurotypical College Students

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Background: The Broader Autism Phenotype (BAP) is a collection of sub-diagnostic autistic traits. Relatives of autistic individuals are known to score higher on measures of BAP (Sasson et al., 2013), though sub-diagnostic autism traits are also present in the general population (Constantino & Todd, 2003). Individuals with elevated BAP levels in the general population report more social difficulties, lower relationship satisfaction, lower social connectedness, higher loneliness, and greater anxious and depressive symptoms (Beffel et al., 2021; Stice & Lavner, 2019). It is important to understand what features of BAP may be driving social difficulties and relationship differences experienced by high-BAP individuals.

Objectives: The objective of the present study is to better understand which BAP characteristics drive friendship quality in non-autistic young adults.

Methods: The current sample includes 173 non-autistic students ages 18-25 ($M = 18.75$; 72.3% female) recruited through community outreach on an undergraduate college campus. Participants completed self-report measures assessing quality of friendships (FQ; Baron-Cohen & Wheelright, 2004) and characteristics associated with the BAP (BAP-Q; Hurley et al., 2007). The BAP-Q produces 3 subscales: social aloofness (i.e., a lack of interest or enjoyment in social interaction), rigid personality (i.e., little interest in or difficulty adjusting to change), and pragmatic language problems (i.e., deficits in the social aspects of language, such as with reciprocal conversation). The FQ total score and BAP-Q subscales were used in the current analyses while controlling for gender.

Results: Friendship quality was negatively associated with social aloofness ($r(173) = -0.37, p < .01$) and pragmatic language abilities ($r(173) = -0.21, p < .01$). Friendship quality was not significantly correlated with rigid personality. Multiple regression was used to predict participants' friendship quality based on their BAP subscale scores. Social aloofness significantly predicted friendship quality while controlling for gender ($\beta_1 = -0.32, t(172) = -4.13, p < .01$), whereas pragmatic language abilities ($\beta_1 = -0.04, t(172) = -0.52, p = 0.60$) and rigid personality ($\beta_1 = 0.05, t(172) = 0.62, p = 0.54$) did not. This regression model accounted for 21.7% of the variance in friendship quality ($R^2 = 0.217, F(4, 167) = 11.58, p < .01$).

Conclusions: Findings from the current study indicate that BAP traits differentially predict friendship quality in neurotypical college students; namely, more social aloofness predicts poorer friendship quality, whereas rigid personality and pragmatic language abilities do not predict friendship quality. The current research contributes to our understanding of which aspects of the BAP might be related to the increased social difficulties experienced by this population. These findings suggest that self-reported lack of interest or enjoyment in interaction with others is the driving factor in self-reported poorer friendship quality for high-BAP individuals, not features related to difficulties with change or social communication behaviors. These data may be relevant for clinicians working with high-BAP individuals who present with higher loneliness, lower social connectedness, and greater internalizing symptoms. Future research should explore the relationship between the BAP and friendship quality amongst a more diverse sample to examine whether these findings generalize to the greater BAP population.

442.321 The Detection of Disruption in Social Contingency Relates to Autistic Traits

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Background: A variety of social cognitive tasks have been created to characterize the social differences seen in autism spectrum disorder (ASD). These tasks typically involve static stimuli, cartoon representations, or interpretations of social statements. While these have been incredibly useful to our understanding of ASD, they frequently suffer from 2 key limitations – 1) they often lack a ground truth (thus making performance more about consensus than accuracy) and 2) the tasks often cannot be systematically and parametrically manipulated.

Objectives: We sought to overcome these limitations by designing a task to measure perceptual sensitivity to interpersonal interactions. Stimuli were constructed by recording natural dyadic conversations and then experimentally modifying the conversations by subtly shifting the timing between the videos, thus disrupting the contingent social-communicative dynamics expressed between them. We hypothesized that performance on this task would vary parametrically as a function of the amount of temporal shift (more difficult with the smallest shift), and that performance would be related to autistic traits (specifically, social aloofness).

Methods: *Stimulus Creation.* Video data was collected from pairs of strangers who participated in a ten-minute conversation. Participants were instructed to get to know each other. All conversations captured face-forward views of both interaction partners. Twenty conversations (40 individuals) were used to create 120 five-second video clips (without audio). Half of these video clips were not modified in any way (matched condition; 60 stimuli) while half were altered such that one individual in the social interaction was advanced or lagged either 1.5 seconds, 3 seconds, or 4.5 seconds ahead or behind the other individual in the interaction (20 stimuli per condition). *Task.* Twenty neurotypical participants were instructed to determine whether the timing between the interaction partners had been shifted, or not. Participants also completed the Broad Autism Phenotype Questionnaire (BAP-Q) as a measure of social aloofness. *Analyses.* D-prime (d' or sensitivity) was calculated for each of the 3 conditions (1.5s, 3s, 4.5s) as well as for overall performance (all shifted conditions compared to the matched condition).

Results: We found that, overall, people are able to discriminate between matched and shifted stimuli [$d' = 0.55$ ($SD = 0.27$); $t(19) = 8.98, p < 0.001$, one-sample t-test]. In support of our hypotheses, we found a relationship between discriminability and shift size [$d'_{1.5s} = 0.39$ (0.30), $d'_{3s} = 0.53$ (0.31), $d'_{4.5s} = 0.70$ (0.39); $F(2) = 4.32, p = 0.02$, one-way ANOVA] (Figure 1). Furthermore, overall performance on the task was significantly correlated with social traits: individuals with higher levels of aloofness performed worse on the sensitivity task [$r(19) = -0.48, p < 0.05$] (Figure 2).

Conclusions: We find that people are sensitive to temporal shifts in social contingencies in a parametric way (with increasing shifts leading to increased discriminability), and that sensitivity to these alterations relates to individual differences that track social aloofness. Data collection is ongoing and will examine performance in autistic compared to non-autistic individuals, examine how performance may relate to other measures of social cognitive ability and real-world behavioral measures (e.g., social network size), and continue to optimize the task to maximize detection of stable individual differences in the perception of social contingency.

**442.323** The Intersection of Autism and Race Influencing Social Perspectives of White Vs. Black Autistic and Neurotypical Targets

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Background: A growing interest in taking a social model approach to autism research indicates that Autistic people are marginalized and socially stigmatized (Alkhalidi et al., 2021; Sasson et al., 2017). However, extant research has primarily focused on white autistic people, which fails to account for how individuals with intersecting subordinated identities (e.g., Black and Autistic) may be subjected to differential rates of identity devaluation and marginalization (Purdie-Vaughns & Eibach, 2008).

Objectives: In this research, we take an intersectional approach to investigate how perceivers' impressions and mental representations of autism interact with racial identities of the target. We aimed to confirm whether or not participants held stereotypic and biased beliefs about Autistic people broadly, and if these beliefs were consistent—or potentially even harsher—towards black Autistic people.

Methods: Participants were randomly assigned to one of the following between-subjects conditions: Black Autistic Person, Black Person, White Autistic Person, or White Person. They first wrote down five adjectives that spontaneously came to mind when thinking of that group, and then rated their assigned group on a number of fundamental person perception (warmth, sociability, morality, trustworthiness, honesty, competence, ability, assertiveness, dominance, masculinity, femininity) or stereotype relevant (athleticism, IQ, EQ, volatility, unpredictability, aggressiveness) traits. The five adjectives were treated as each participant's verbal character representation of their group, and were evaluated using a natural language processor (SADCAT; Nicolas et al., 2020). Participants also responded to two open-ended questions regarding how their community and personal experiences informed their impressions of autistic people.

Results: Participants largely rated black and white targets very similarly across traits and domains. However, there were differences in ratings of Autistic compared to non-Autistic targets, with Autistic people generally being rated more negatively. For example, on agentic traits, sociability, emotional intelligence, and athleticism, Autistic people were given lower ratings than non-Autistic people, and for most of these traits the neurotype difference was especially or only true for black targets. The patterns from direct ratings largely held when evaluating participants' indirect impressions by analyzing their spontaneous character profiles using NLP as well. Finally, participants' responses to the open-ended questions demonstrated an othering alongside negatively labeled characteristics, such as being "cold", "unsympathetic" and "liable for outbursts or breakdowns". Most impressions were formed indirectly based on what participants had been told by their communities or seen in media. Participants that had personal experience with Autistic people were more likely to identify redeeming characteristics such as "authenticity" and "strong moral codes".

Conclusions: Overall, though we found very little direct evidence of racial bias against black targets, there was clear and consistent evidence that participants held negative attitudes towards Autistic targets across all three measurement types. While efforts to reduce racism have been an important focus in American society for decades, the same has not been true for ableism or anti-autism bias, which seems to be reflected in our results. Furthermore, the multiply marginalized black Autistic targets did in fact elicit unique—and particularly even more negative—impressions from participants, in line with previous intersectionality research in other domains.

442.324 An Examination of Autistic Student Friendship Trajectories during and Following Participation in a School-Based Social Skills Intervention

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Background: Autistic children often experience non-reciprocal friendships, characterized by unbalanced social interactions (Kasari et al., 2011). These relationships are more common than in non-autistic peers and are linked to outcomes such as loneliness, anxiety, and depression (Mazurek, 2014). Enhancing friendship reciprocity is important for fostering social well-being and quality of life (Rotheram-Fuller et al., 2010). Peer-mediated interventions (PMIs), where neurotypical peers serve as models to facilitate social skill development, have emerged as effective strategies to foster friendship reciprocity (Carter, 2021). Schools are ideal settings for implementing PMIs, as they offer structured environments with ample opportunities for social interaction.

Objectives: This study examined changes in friendship reciprocity between autistic students and their neurotypical peer models during a targeted social skills intervention. Specifically, we investigated how autistic students' friendship endorsements of peer models and peer models' friendship endorsements of autistic students changed over the course of a peer-mediated intervention and at a 12-week follow-up. Additionally, we explored how friendship reciprocity between autistic students and their neurotypical peers evolved during and after intervention.

Methods: Participants included 39 autistic students (ages 6-11) and 107 neurotypical peer models. All participants were part of a larger RCT of a peer-mediated social skills intervention (Kasari et al., 2012). The intervention involved training neurotypical peers to facilitate social interactions with autistic students. Autistic students and peers were asked to identify individuals they enjoy spending time with (friends) and those they prefer not to spend time with (non-friends) on a friendship survey. Responses were coded to determine friendship reciprocity. We examined four types of relationships, which have been shown to impact outcomes for autistic individuals: 1) Equally Reciprocal Friendships; 2) Reciprocal Friendships; 3) Autistic Student non-endorsed (i.e., autistic student rated peer as a friend and peer did not rate them); and 4) Autistic Student non-liked (i.e., autistic student rated peer as a friend and peer rated them as non-liked). Logistic multilevel models were used to assess changes in friendship endorsements and reciprocity over time.

Results: Autistic students demonstrated significant increases in friendship endorsements during intervention, with increases in the number of friends they endorsed and a decrease in number of outward non-liked endorsements. However, these increases were not sustained at follow-up, with endorsements returning to near-baseline levels. Neurotypical peers showed significant increases in their friendship endorsements of autistic students during intervention, with gains also diminishing at follow-up. Regarding friendship reciprocity, significant improvements were observed during intervention, with more reciprocal friendships forming between autistic students and their peers. These reciprocal friendship ratings declined following intervention. Significant changes were not observed for the other three types of reciprocal relationships.

Conclusions: PMIs are effective in promoting friendship reciprocity and increasing social inclusion for autistic students. However, the observed decline in social gains post-intervention indicates that continued supports may need to be in place. Future research should explore long-term interventions or follow-up booster sessions to maintain gains in friendship reciprocity. Additionally, embedding PMIs into the routine school day and training school staff to support positive peer interactions may help sustain progress.



442.325 The Role of Age in Social Camouflaging in Autism: A Meta-Analytic Review

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Background: Autism is diagnosed more frequently and earlier in males versus females. Social camouflaging, or the hiding, masking, or suppression of autistic traits, has been theorized to contribute to these diagnostic discrepancies. Existing studies have primarily examined how gender may relate to camouflaging, with varying results. Few have directly analyzed age-related differences in camouflaging behaviors. However, age could be a crucial factor to understanding individual differences in camouflaging and how these may impact diagnostic timing. We hypothesized that the relationship between age and camouflaging will be stronger for autistic females across all age groups.

Objectives: This meta-analysis investigates the relationship between age and camouflaging in autism. We aimed to determine if gender moderated the relationship between age and camouflaging.

Methods: We followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) for reporting our meta-analysis findings. To be included in the analysis, studies must have : reported the correlation analysis or correlation table for the relationship between age and camouflaging, included autistic individuals, with a focus on autistic individuals in mixed-neurotype samples; and used either a discrepancy, observational or self-reported method of measuring camouflaging. The literature search, conducted between February and March 2024, involved two coders searching PubMed and APA PsycInfo using the terms: *autis* or ASD or Autistic or Autism spectrum disorder AND age or child* OR children or adolescents or adults AND Camouflaging or Masking OR Impression management OR Compensation*. 68 articles were screened with 13 deemed suitable for further analysis. Age was coded as a continuous variable (using mean and standard deviation), while gender was coded as a categorical variable and recorded as a percentage. A random effects meta-analysis calculated the average effect, and a mixed effects meta-analysis examined the moderating effect of gender. Effect sizes were regressed on gender in a restricted maximum likelihood meta-regression.

Results: There was a small negative effect of age on camouflaging (pooled $r = -0.040$; 95% CI = $-0.122, -0.042$; range = -0.22 to 0.19). There was high heterogeneity between effect sizes ($I^2 = 85.96\%$, $<.001$, $QE = 84.29$, $p <.001$). Egger's test and visual inspection of the funnel plot indicated no publication bias ($z = 0.32$, $p = 0.748$). Moderator analysis showed that gender (%female; $B = .002$, $SE = .002$, $p = .255$) did not have a significant moderating effect.

Conclusions: Meta-analysis of the extant literature suggests that age has a small negative effect on camouflaging, such that camouflaging behaviors decreased with age. This corroborates work suggesting that autistic children/teenagers camouflage more than older or autistic adults. Contrary to our hypothesis and previous theory, no significant moderating effects of gender was observed. This may be due to the disproportionate sampling of females in the studies or a lack of younger age groups in the data (see Table 1). From a developmental perspective, these findings are relevant to autistic youth as they may be prone to experience later-life outcomes due to early camouflaging behavior and these results should inform how clinicians provide support and resources.



442.326 The Role of Anxiety in Predicting Visual Attention to Faces Among Autistic Children: Results from the Autism Biomarkers Consortium for Clinical Trials (ABC-CT)

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Background: Previous studies indicate that children with autism spectrum disorder (ASD) experience higher rates of anxiety disorders than typically developing (TD) peers, with roughly 40% of autistic youth having at least one co-occurring anxiety disorder (Mingins et al., 2021). Research using eye-tracking technology indicates that many children with ASD attend less to faces (Shic et al., 2022) and eyes (Unruh et al., 2016). Similarly, individuals with general and social anxieties may avoid fixations to the eye (Günther et al., 2021). However, the influence of anxiety symptomatology on visual attention to social stimuli in ASD is still unclear (Wei et al., 2023).

Objectives: The current study aimed to examine the relationship between social and generalized anxiety symptoms and visual attention to faces in children with and without ASD.

Methods: Participants included 395 children ages 6-11 (autistic=276, TD=119, $M_{age} = 8.37 \pm 1.65$ years, 74.43% male) that participated in the Autism Biomarkers Consortium for Clinical Trials (ABC-CT). Binocular eye-tracking data was collected at 500Hz using an SR Eyelink 1000 Plus.

Participants were presented with six photographs of children or of children and adults for 20 seconds each. Percent looking to faces was calculated as the number of valid gaze samples in a pre-defined region around the face content divided by the total number of onscreen gaze samples. To measure child anxiety symptoms, we utilized the anxiety subscales from the Childhood and Adolescent Symptom Inventory, 5th Edition (CASI-5) completed by caregivers. Multiple linear regressions were conducted to determine relationships between anxiety type and percent looking to faces by diagnostic group, covarying for age.

Results: Social anxiety significantly predicted percent looking to faces in the ASD group ($\beta = 0.004$, $p = .008$) such that increased social anxiety was associated with increased attention to faces. Similarly, child age was significantly predictive of increased looking to faces in the ASD group ($\beta = 0.003$, $p = .004$). The interaction between social anxiety and age in the ASD group was significant ($\beta = -0.00004$, $p = .011$) such that with increasing age, higher levels of social anxiety were associated with decreased attention to faces. General anxiety did not predict percent looking to faces in the ASD group controlling for age ($\beta = 0.003$, $p = .195$). No significant relationships between general ($\beta = 0.004$, $p = .546$) or social ($\beta = -0.0005$, $p = .945$) anxiety and percent looking to faces were found among the TD group.

Conclusions: Social anxiety yielded a significant influence on looking to faces in children with ASD but not non-autistic children. This relationship was related to age such that older children with social anxiety were less likely to look at faces; these results are consistent with previous findings that social anxiety relates to increased avoidance of faces in autistic children as they age (Chen et al., 2020). Group differences and relationships to social attention were not observed for general anxiety, suggesting specific relevance of social anxiety to social visual attention. Characterizing the distinct ways in which social anxiety influences social behavior in children with autism may inform development of supports for autistic individuals. For example, these data raise the possibility that treating anxiety might impact social differences in ASD.

442.327 The “Reading the Mind in Films” Task: A Pilot Study on Complex Emotion Recognition for the Italian Adaptation in Adults with and without Autism Spectrum Conditions

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Background: Emotion recognition, particularly of complex emotions, is a cognitive challenge for individuals with Autism Spectrum Condition (ASC). The Reading the Mind in Film (RMF) task, designed to assess emotion and mental state recognition in naturalistic settings, has been adapted into few languages but lacks of an Italian version. This study adapts the RMF task for an Italian adult population and explores its effectiveness in differentiating emotion and mental state recognition abilities in adults with and without ASC.

Objectives: The main objectives are to (1) adapt and translate the RMF task for Italian adults, and (2) compare the performance of individuals with ASC to neurotypical adults in emotion and mental state recognition via this task.

Methods: We adapted the 22 film clips available from the Autism Research Centre (University of Cambridge), by translating the scripts of the clips into Italian. The correctness of the translation was verified using the back-translation method. Professional voice actors performed the dubbing of the clips. The meticulous audio editing ensured synchronization while maintaining the original emotional tone matching the mental state of the films' characters. We included 44 participants (20 male, 22 female), divided into the ASC group (N = 22; F=11 ; M=10) and the neurotypical control group (N = 22; ; F=11 ; M=10). The ASC adults were all attending a post-diploma filmmaking course. Participants completed the Autism-Spectrum Quotient (AQ) and two mental state recognition tasks: the Italian adaptation of RMF and the Italian version of Reading the Mind in the Eyes Test (RMET).

Results: The control group's performance was consistent with findings from the original RMF study, confirming the validity and reliability of the Italian translation and dubbing process. The dubbing process accurately conveyed emotions, matching the original study by Golan and colleagues (2006). The congruence in response accuracy validates the rigorous translation process. However, no significant performance differences were observed between the ASC and the control group, which may be due to the experience of the ASC group with films, gained from their filmmaking training.

Conclusions: These results suggest that specialized training in visual media, such as filmmaking, might affect emotion and mental state recognition performance in adults with ASC. Further research is needed to assess how visual expertise influences social cognitive abilities in individuals with ASC.

442.328 Understanding Autistic Adults' Social Motivation

K. M. Baro and **A. Nadig**, McGill University, Montreal, QC, Canada

Background: Social motivation (SM), or the mechanisms that drive individuals to orient to and take part in the social world, seems key to understanding and explaining Autistic social experiences. Chevalier et al. (2012) offered the first, widely accepted, hypothesis of SM in Autism. They hypothesized that Autistics have reduced SM compared to neurotypicals according to observations of reductions of social orienting, seeking and liking and social maintaining behaviors. As highlighted by Jaswal and Akhtar (2019), reports of Autistic lived experience have challenged Chevallier et al (2012)'s diminished SM hypothesis of Autism by highlighting evidence of Autistic interest and engagement in the social world. In addition, Jaswal and Akhtar point out that characteristics of Autism such as sensory sensitivities may interfere with Autistic Adults SM manifesting in expected (neurotypical) ways. No research has looked at how Autistic Adults themselves characterize their SM, furthering a deficit-based, neurotypical-focused understanding of Autism.

Objectives: The objective of this study is to gather and analyze the valuable perspectives of Autistic Adults on their SM to increase our understanding of their SM.

Methods: The first author, an Autistic Master's student, has conducted interviews with 12 Autistic Adults without Intellectual Disability on how they think, feel and act in relation to their SM. Participants took part online or in-person and were recruited from across Canada. The interviews, lasting a maximum of 2 hours, were in French or in English. The semi-structured interview protocol was based on 8 themes (Social Opportunities, Social Interest, Meaning of Relationships, Value of Social Support, Perception of Self in the Social World, Social Initiative Taking, Social Flexibility, and Motivation to Conform Socially) elaborated from existing SM measures (Gong et al., 2020; LLerena et al., 2013; Elias & White, 2020; Phillips et al., 2019). This protocol was reviewed and updated based on feedback from the first four participants, as recommended by Castillo-Montoya (2016).

Results: The first author will analyze the interviews following Braun and Clarke (2006)'s six-phase Reflexive Thematic Analysis guidelines. Thus far, four interviews have been transcribed with initial coding completed. The 8 a priori themes are present and represented in these transcripts, with additional codes surfacing in the transcripts as well. Final themes will be elaborated to reflect significant codes from all twelve interviews by February 2025.

Conclusions: The interviewed Autistic Adults have provided detailed and rich responses with respect to their own SM. It is anticipated that the full analysis of this data will constitute a novel contribution in understanding Autistic SM (specifically what influences it) and, more generally, the social experiences of Autistic Adults as explained by themselves.

442.329 Visual Attention in Autism: The Role of Social Anxiety and Facial Context in Gaze Patterns

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Background: Distinct patterns of eye contact are a well-documented feature of autism, with autistic individuals often describing direct eye contact as aversive, overstimulating, or distracting. These experiences may contribute to diminished eye contact during interpersonal interactions. In contrast to non-autistic individuals, prior research suggests that autistic individuals do not display an inadvertent attentional bias to look towards eyes, even when explicitly instructed not to. However, factors driving differences in eye contact remain unknown, and key potential contributors, such as social anxiety, have not been adequately studied. In the present study, we utilize eye-tracking data to investigate differences in gaze trajectory in response to direct eye cues, aiming to better understand the role of anxiety in modulating gaze behavior in autistic adults.

Objectives: To investigate attentional differences in disengagement from eyes relative to other facial features and their association with individual differences in anxiety between autistic (ASD) and neurotypical (NT) adults.

Methods: Participants were 67 adults (34 ASD [confirmed with ADOS-2], 33 NT) ages 18-39 ($M=27.2$, $SD=5.64$). Participants completed an eye tracking task in which a fixation cross was presented on a screen preceding a face over a gray background. Fixation cross locations (FCLs) were placed such that, when the face appeared, participant gaze was directed to a facial feature (nose, mouth, left eye, or right eye). Data were collected at 500 Hz using a SR EyeLink 1000 Plus remote eye tracker. Attentional disengagement was operationalized as the latency to look more than 2 degrees of visual angle away from the facial feature. Attentional disengagement time was calculated within participants and across trials for each FCL, while anxiety features were assessed using the Liebowitz Social Anxiety Scale (LSAS).

Results: A mixed-effects model revealed that diagnostic group ($F(1,66)=0.09$, $p=.762$) and LSAS total score ($F(1,68)=0.62$, $p=.432$) were not associated with changes in attentional disengagement, while FCL was associated with changes in attention such that people looked away from mouths faster than they did from eye regions ($F(3,190)=7.19$, $p<.001$). Additionally, a significant three-way interaction was observed between FCL, diagnostic group, and LSAS score ($F(3,192)=4.59$, $p=.004$) indicating that disengagement from facial features varied across groups as a function of anxiety. Increased anxiety was associated with longer looking to the left-eye in the NT group ($r=0.37$, $p=.029$) but not in ASD ($r=-0.07$, $p=.67$), whereas this pattern was not identified in the right eye.

Conclusions: We identified that all participants disengaged more rapidly from socially uninformative facial regions, such as the mouth, compared to the eyes. In the ASD group, social anxiety differentially predicted disengagement from uninformative face regions. These findings did not support a baseline difference in visual attention to the eyes in autistic individuals but suggested that increased anxiety delayed attentional disengagement; this may suggest that anxiety heightens attention to emotionally salient information contained in the eyes. Ongoing analyses will explore how sensory and social characteristics relate to attentional disengagement and whether increased anxiety is associated with a bias toward looking to the eyes when attention is initially directed elsewhere.



442.330 R/AutismInWomen As a Site of Social Support for the Unique Needs of Autistic Women

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Background: Prior work indicates that women on the autism spectrum are more likely to experience negative mental health and loneliness than the general population (Lee, 2019; Lai, 2019; Newell, 2023; South, 2020; South, 2021; Twenge, 2020; Sedgwick, 2020). This has been attributed to an increased likelihood of masking, under-diagnosis, and misdiagnosis of autism in females (Miller, 2021; Fede, 2023; Haney, 2016). Research suggests pseudo-anonymous forums can be a vehicle for accessing social support (De Choudhury, 2014) and thus we study whether and how autistic females are using such forums. We focus on communities related to autism on a commonly used pseudo-anonymous platform, Reddit (Gottfried, 2024). The two largest communities are the subreddits r/autism (for anyone on the autism spectrum) and r/AutismInWomen (for women on the autism spectrum).

Objectives: We seek to compare disclosure content and behaviors between a general autism support forum (r/autism) and a forum specifically to support autistic women (r/AutismInWomen) to understand and compare the role of each in supporting autistic women.

Methods: In order to collect posts from the most active Reddit users, we examined users who had posts on the “Hot list”, a list which features the most popular posts on a subreddit at any given moment. On April 13, 2024 we gathered the top 1000 “Hot list” responses from both r/autism and r/AutismInWomen using the Reddit developer API. We then extracted the list of users who had made these posts (1,726 users). We narrowed our list of users to those who have previously posted in both subreddits (192 users). This allows us to make comparisons of what a given individual decided to share on which subreddit. We then collected all the posts which they had made in the two communities. For posts on both forums, the first author utilized inductive coding to analyze the posts and perform a content analysis (McDonald, 2019). Then an individual level analysis was performed to compare the content users chose to post on each of the subreddits. Posts from 50 users (381 posts total, 7.62 posts per user on average) were analyzed. The remainder of users’ posts will be analyzed prior to the conference.

Results: We found that users disclose different types of content in the two forums. Specifically, when seeking instrumental support users will share information in both subreddits. When discussing more sensitive topics such as mental health or seeking emotional support, users would post in one or the other subreddit. When sharing topics which may have unique contexts to autistic women (i.e., masking and diagnosis) users would primarily post only in r/AutismInWomen - one user shared “I want to unmask but I’m worried that I will face even more infantilization.” Further details of the findings will be shared at the conference.

Conclusions: Autistic females are consistently understudied and under-served. As offline support is often unavailable for this population, many turn to online forums such as Reddit. This study takes a first step in understanding the mechanism of support on Reddit for this population.

442.331 Examining the Effects of Generative-AI Chatbots on Autistic Young Adults

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Background: Generative AI-based chatbots have emerged as an effective tool for advertisers (Arsenijevic, 2019). Many widely available chatbots, such as MetaAI, use human-like characters in their interface. While there has been limited research on the effect of these chatbots on autistic individuals, research in a broader context has shown that autistic individuals are more likely to anthropomorphize non-human actors. This can lead to feelings of guilt when doing something the individual perceives to upset the actor (White, 2019; Clutterbuck, 2022). Coupled with an increased likelihood of autistic adults having lower financial literacy (Galizzi, 2023), chatbot advertisements have the potential to be harmful for this population.

Objectives: To understand the effects of generative-AI based chatbots on perceived preferences for autistic young adults with substantial support needs and low support needs.

Methods: We developed an experimental survey where participants were asked to rank a series of consumer products (e.g., chocolate bar types, fast food), in order of most to least favorite. Participants then viewed a chatbot interaction, where the chatbot shared the opposite opinions about the products (i.e., whatever the participant ranked as their favorite, the chatbot would state it disliked; whatever the participant ranked as their least favorite, the chatbot would state it liked). After viewing the interaction, participants were asked to once again rank the items. We tested whether the most favorite item's ranking had decreased and the least favorite increased.

We deployed this survey with three groups: neurotypical individuals, autistic adults with substantial support needs (autisticS) and autistic adults with low support needs (autisticL). We then ran tested for ranking differences before and after viewing the chatbot interaction using the Wilcoxon Signed Rank test. The Mann-Whitney U test was used to probe on between-group differences.

Results: For autisticS, the least favorite ($z=3.95$, $p=0.0000$) and most favorite ($z=-2.81$, $p=0.0080$) item rankings changed significantly. For autisticL, the least favorite item ranking ($z=3.15$, $p=0.0020$) and most favorite item ranking ($z=-2.64$, $p=0.0156$) also changed significantly. For the general population, only the least favorite item ranking ($z=4.15$, $p=0.0000$) changed significantly. We also found that these changes were significantly greater for autisticS than the general population ($z=-2.75$, $p=0.0079$; $z=2.55$, $p=0.0101$). AutisticL was not statistically different from the general population ($z=1.74$, $p=0.1255$; $z=1.59$, $p=0.1136$). AutisticS had a significantly bigger change than AutisticL only for least favorite ($z=3.84$, $p=0.0001$).

Conclusions: This work shows that chatbots have a greater influence on autistic adults with substantial support needs, leaving them more vulnerable. This work underscores the need to include this population in research.

Poster Session

443 - Combined Topics V

May 3rd, 2025, 12:30 PM - 1:30 PM - Hall 4A

443.332 Social Media Safety Literacy for Emerging Adults: A Rule-Based Curriculum

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Background: Social Media has shown to provide many benefits including social capital, accessing resources, and professional development (Gillespie-Lynch et al. 2014). Recent work reveals how social media can enormously benefit those on the autism spectrum by allowing them to make social connections, but also points to how autistic social media users interpret social media features literally, leading to social, psychological, and physical harms (Page et al. 2022).

Objectives: Mitigate the harms that autistic young adults face on social media through an educational intervention.

Methods: We developed a social media literacy educational intervention with a team of multidisciplinary autism researchers. The materials were catered to autistic young adults and covered a range of topics including the social norms of social media, how to choose safer settings, how to identify fake profiles, how to classify connections into social groups, determining what types of information is safe to share with various audiences, and the differences between social media and reality. We utilized an algorithmic, rule-based pedagogy in the modules teaching participants how to make safe decisions. We then deployed the educational intervention to 15 participants at a local residential program for autistic young adults (ages 18-29) with substantial support needs - one student had intellectual disabilities. Immediately before and after each lesson, participants were given a knowledge assessment. Both knowledge assessments were identical, and participants were not told whether they had correctly answered the questions. We then used Wilcoxon Signed-Rank tests to determine whether there was a difference between their scores initially and after the intervention. We also qualitatively coded classroom utterances to understand the differences between students who had an above or below average change in learning effect.

Results: We found that there was a statistically significant improvement between the initial and post-intervention assessment score for several rule-based modules: social norms of social media, how to identify fake profiles, and classifying profiles into social groups. We also found that participants who had an above average improvement in score were the ones actively participating in class (both answering and asking questions).

Participants who had a more modest improvement in score were less verbally involved in class, occasionally bringing up unrelated information when there was a lull. The student with intellectual disability fell in this group of those who improved to a more modest degree. Finally, one student in the class had scores that decreased. This student was frequently verbally engaged, but their responses were tangential to the current topic.

Conclusions: This research suggests that algorithmic rule-based lessons can be effective in teaching autistic young adults about how to make safer decisions on social media. Furthermore, our work underlines how active involvement in a classroom setting can be an indicator of successful outcomes for this population.



4443.333 Investigating Alterations in the Limbic System in Preschoolers with Autism: A Diffusion Tensor Imaging Tractography Study

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Background: It has been suggested that alterations in the limbic system are implicated in social-communicative as well as associated mental health features of Autism. However, evidence of differences in limbic tracts in autistic preschoolers is largely lacking. While previous studies have shown changes in white matter (WM) tracts in the limbic system in individuals with autism who are school-aged and older (e.g., Ameis et al., 2013; Ikuta et al., 2014), few studies examined white matter difference in the limbic system in younger children.

Objectives: The objectives of this study were to examine white matter differences in limbic tracts between autistic and typically developing preschoolers using Diffusion Tensor Imaging (DTI) Tractography, and to assess the association between white matter properties and strengths of autistic features as well as social adaptive behaviour respectively in the autism group.

Methods: To date, DTI data were acquired from 102 preschoolers participating in The Preschool Brain Imaging and Behaviour Project (PIP). In the preliminary analyses, we compared the first batch of the samples consisting of 25 autistic preschoolers (mean age: 44.6 months) and 44 typically developing (TD) preschoolers (mean age: 42.2 months). The cingulum and uncinate, as well as the two sub-divisions of the cingulum – the superior and temporal cingulum, were dissected using MegaTrack, an automated dissection methodology. Their tract volume and anisotropy (fractional anisotropy, FA; hindrance modulated orientational anisotropy, HMOA; and anisotropic power, AP) were quantified and the two groups were compared using one-way analysis of covariance. Strength of autistic features was measured using the Social Responsiveness Scale-2 and social adaptive behaviour was assessed with the Vineland Adaptive Behavior Scales-3. Their associations with tract volume and anisotropy were analysed using partial correlation analyses, controlling for age, sex and scanner type.

Results: Preliminary analyses showed no significant mean-group differences between the autistic and TD groups in any tracts. Similarly, there was no significant correlation between the white matter tracts and autistic features or level of social adaptive behaviour in any tracts.

Conclusions: To our awareness, this is one of the first preschool MRI studies examining white matter tracts in the limbic system in autistic preschoolers. While the sample size of preliminary analyses is similar to those in other MRI studies, our null-finding is inconclusive. This may indicate that preliminary analyses were under-powered to detect mean-group differences, that the limbic system is not affected in preschoolers with autism, or that heterogeneity of autism was a contributing factor. We will present data from the whole sample and use clustering approaches to detect potential subgroups with white matter differences in the limbic system.