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Exploring the effective agile team model: a qualitative mixed-methods study among practitioners

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Abstract

Purpose – Self-managing, cross-functional agile teams are popular, but the predictors of team effectiveness require more study to address a growing need to understand team functioning in complex, constantly-changing, technology-driven environments. This paper aims to report an empirical exploration and enrichment of the predictive model of effective agile teams (EAT) stemming from a previously conducted systematic literature review.

Design/methodology/approach – A qualitative mixed-methods approach was taken, which started with ten semi-structured interviews with five agile-team scholars and five senior agile practitioners who critically reviewed the EAT model. The adapted model was then further explored by group interviewing six agile teams. All data was analyzed following the Gioia methodology.

Findings – The EAT model captured the most important agile team effectiveness predictors and was further refined and advanced by removing redundancies (e.g. by integrating "clarity on roles and goals" into the predictor "shared mental models") and the lowest scoring predictor "team modification" which occasionally contributes to EAT. Closed-loop communication was seen as the most essential predictor followed by team trust.

Originality/value – Traditional team effectiveness models contrast, on certain aspects, with agile team effectiveness characteristics. This research extends the existing EAT model into a more dynamic one of continuous team adaptation, to explain the inner workings of EATs and brings actionable insights. Agile practitioners will benefit from using the enriched EAT model to improve team effectiveness and, ultimately, lay the foundation to foster an agile culture.

Keywords Agile teams, High team effectiveness, Agile transformation, EAT model, Self-managing teams

Paper type Research paper

1. Introduction

Self-managing, agile teams have become crucial to develop software solutions (Dingsøyr and Lindsjørn, 2013; Strode *et al.*, 2022), improved organizational performance and employee

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engagement (Beck *et al.*, 2001; Peeters *et al.*, 2022; Dikert *et al.*, 2016). Effective agile teams can be a critical asset to the competitiveness and overall success of an organization, by responding fast to the volatile, rapidly changing business environment in which it operates (Peeters *et al.*, 2022; Rigby *et al.*, 2018). Agile teams often serve as the "delivery unit" of products and services and are small cross-functional, self-organized teams composed of empowered members who commit to a common purpose and work iteratively, in small modules with tight customer-feedback loops, allowing them to quickly adapt to changing requirements and environments (Bastiaansen and Wilderom, 2022; Šmite *et al.*, 2023). Agile teams set their own performance goals and hold themselves mutually accountable (Dingsøyr *et al.*, 2016). Despite their promise, agile teams are often not functioning to their fullest extent, which is a concern for many executives given agile teams' central role in organizations (Dingsøyr *et al.*, 2018; Peeters *et al.*, 2022; Strode *et al.*, 2022).

Team effectiveness is a multidimensional concept as it is applicable to different types of teams, including work teams, parallel working teams, project teams, and may also differ depending on team size and team maturity (Delgado Piña *et al.*, 2008; Gren *et al.*, 2020). Agile teams tend to function as small, cross-functional teams with a facilitator and team members, consisting of 6–12 members which can change in terms of team composition (Lindsjørn *et al.*, 2016; Schwaber and Sutherland, 2020). Different agile team types exist, for instance, Squads and Scrum teams (Šmite *et al.*, 2023). Both the terms self-organizing and self-managing terms are used among scholars and practitioners, though they are distinct: the former focuses exclusively on how to accomplish tasks, whereas the latter includes decision making which tasks to pursue and managing their performance and outcomes (Dingsøyr and Lindsjørn, 2013; Šmite *et al.*, 2023). As the more mature agile teams are characterized as self-managing teams we will use this term throughout, whereby team dynamic elements can be "used to assess the successes of self-managing agile teams" (Delgado Piña *et al.*, 2008, p. 9; Christian *et al.*, 2017; Peeters *et al.*, 2022). Team dynamics are team processes: what teams do, and emergent states: what the team feels, believes or becomes, including for instance communication and effort (Mathieu *et al.*, 2017, 2019). Such a team's shared experiences and perceptions are proposed to generate its desired value, results and/or outcomes (Christian *et al.*, 2017; Dingsøyr *and* Lindsjørn, 2013; Malik *et al.*, 2021).

Considerable research has been done on agile team processes. A previous systematic literature review identified no less than 47 empirically obtained, theory-based predictors of effective agile teams (EAT) (Bastiaansen, 2024). The review's resulting guiding conceptual model was based on the team adaptation theory of Burke *et al.* (2006) which is uniquely suited to agile teams as it emphasizes continuous responsiveness and adjustment to changing environments, enabling teams to excel in fast-paced and innovative contexts. Even though the comprehensive EAT model is grounded in theory-driven agile team research, it has not yet been empirically validated in real-world settings. This raises questions about the EAT model's practical applicability, generalizability and robustness. The present study thus reports on an initial empirical validation of the EAT model, to examine how this theory holds up when applied in actual organizational contexts.

With the help of agile practitioners and teams, this study aims to (a) increase our understanding about effective agile team functioning in practice; (b) expand and enrich the initial EAT model, which was developed based on an SLR of studies that used previously established team theories and (c) thereby point out meaningful, practice-relevant future agile team research. Thus, we answer the question:

Q1. How do agile experts and team members reflect on the recent, literature-based model of highly effective agile team (HEAT) predictors, especially in terms of its relevance and completeness?

A qualitative mixed-methods study was conducted, including semi-structured interviews with agile scholars and senior practitioners, followed by semi-structured group interviews with agile teams. As will be elaborated in the final sections, this study aims to contribute to both agile team effectiveness research and team adaptation theory. Practitioners can use the refined model to develop effective agile team practices.

2. Theoretical background

To build on a century of theorizing work teams, this section presents an overview of team effectiveness theory and how these (do not) fit agile teams, the theoretical underpinning of the EAT model and the need for further exploring the EAT model.

2.1 Team effectiveness

Systematic psychological research on the nature and effects of work groups dates to the Hawthorne studies of the 1920s (Mathieu *et al.*, 2017). Initially, groups were studied primarily to contrast individual performance within a team (Mathieu *et al.*, 2017). The focus subsequently shifted to individual versus team comparisons to a focus on the team functioning itself, using straightforward Input-Process-Output (IPO) models (Mathieu *et al.*, 2017). Seminal scholars built on such team effectiveness process models, for example: Hackman (1987), Marks *et al.* (2001), Salas *et al.* (2005), Hoegl and Gemuenden (2001) and Burke *et al.* (2006). They identified the fundamental elements of organizational performance and understanding how to design and manage teams to improve quality, productivity and employee satisfaction. Influential scholars, such as Kozlowski and Ilgen (2006) and Ilgen *et al.* (2005), further expanded those more linear IPO process models by introducing the logic of the Input-Mediator-Output-Input (IMOI) framework of McGrath (1984) (Mathieu *et al.*, 2008; Marks *et al.*, 2001).

However, the legacy of generic team effectiveness theories are grounded in traditional management principles, which often diverge from agile practices and are therefore probably insufficient to explain agile team effectiveness. Traditional team performance models, for instance, Tuckman's stage model (Tuckman, 1965) and Hackman's normative model of team effectiveness (Hackman, 1987) have provided valuable insights into team development but have several limitations when applied to the context of agile teams. Traditional models often assume stable team composition and linear development phases, which contrasts with role flexibility, dynamic scaling of teams and iterative work cycles characteristic, for example sprints and changing backlog prioritization of agile teams (Moe *et al.*, 2010). Moreover, classic frameworks tend to emphasize formal leadership structures and understate the role of shared and distributed leadership, which has been shown to be crucial for the self-managing nature of agile teams (Hoda *et al.*, 2013; Strode *et al.*, 2022). Further, agile teams are typically structured as self-organized, cross-functional teams (Moe *et al.*, 2010) and characterized by frequent interaction with their customers and stakeholders for feedback, goal setting and enhancement. Thus, agile teams must actively work to preserve an agile mindset and team collaboration to match customer expectations (Bastiaansen and Wilderom, 2022; Moe *et al.*, 2010). Traditional team effectiveness models insufficiently address the high levels of environmental volatility and uncertainty in which agile teams operate (Conforto *et al.*, 2016; Steegh *et al.*, 2025), as well as the need for continuous learning, experimenting, rapid feedback loops and psychological safety – these are all key enablers of agile team effectiveness (Edmondson, 1999; Strode *et al.*, 2022).

Agile teams are thus different from "regular" work teams in that they:

- manage their own responsibilities and tasks, including its prioritization (autonomy);
- produce their tasks through rapid and iterative delivery with a customer-centric approach; and

- have distinctive structural characteristics such as a lacking formal leadership role that creates equality among team members.

This makes existing team effectiveness models less fitting in predicting agile team effectiveness.

2.2 The highly effective agile team model

A recent systematic literature review focusing on agile team functioning addressed this issue of the appropriateness of previous team theories and proposed a literature-based HEAT model (Bastiaansen, 2024), see Figure 1. The HEAT model further conceptualized Burke *et al.*'s (2006) team adaptation theory in the context of agile teams. Team adaptation is "the functional outcome due to the adjustments teams make when faced with emergent contextual changes" (Burke *et al.*, 2006; Christian *et al.*, 2017, p. 62), which may result in adapting also their ways of working (Georganta *et al.*, 2021). This theory was chosen as it is uniquely suited to study agile teams, as agile distinguishes itself due to its promise of improving team's adaptivity (Steegh *et al.*, 2025), through adaptive reasoning, fitting agile's flexible and responsive nature (Burke *et al.*, 2006). Moreover, it proposes that team adaptation occurs through (interrelated) emergent states, including factors that were identified in the systematic review of the agile team literature, namely: team psychological safety, team orientation, communication, backup support, coordination, shared team leadership, team innovation, team modification, shared mental models, closed-loop communication, clarity on roles, team autonomy and team situation awareness.

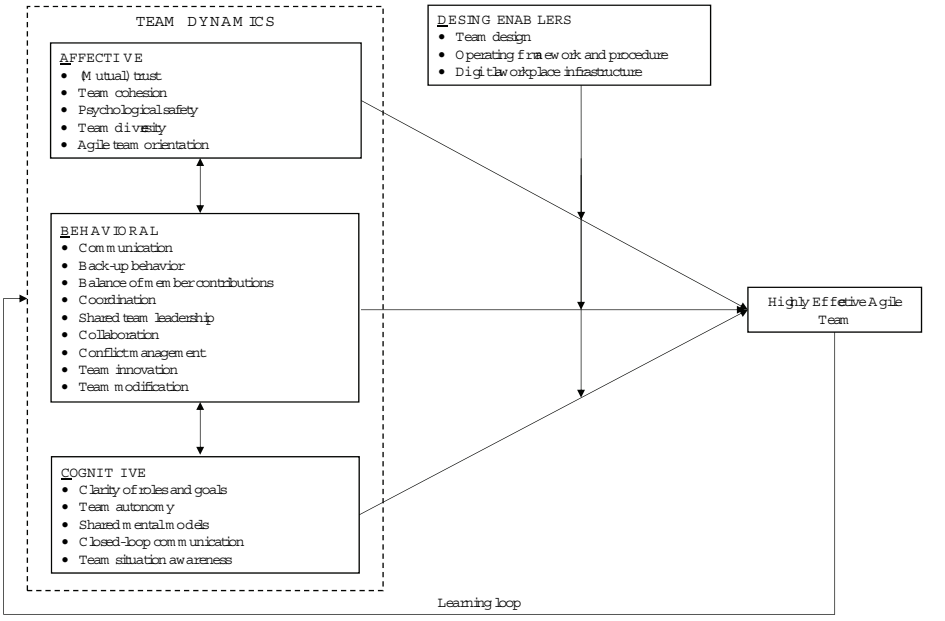

Figure 1. Initial highly effective agile team (HEAT) model
Source: Figure of Bastiaansen (2024)

The predictors in the original HEAT model are categorized into affective, behavioral and cognitive team dynamics and design enablers (hence: ABCD) (Bastiaansen, 2024). The model enhances a learning loop because this is the inherent nature of adaptation processes and agile team development practices (Burke *et al.*, 2006; Rigby *et al.*, 2018; Strode *et al.*, 2022). The affective processes capture "motivational tendencies, relations among team members and affective reactions" (Kozlowski and Ilgen, 2006, p. 87). The behavioral predictors emphasize actions "of what teams do" (Kozlowski and Ilgen, 2006). The cognitive category consists of predictors addressing cognitive constructs that guide "task-relevant interactions among agile team members" (Kozlowski and Ilgen, 2006). In addition, the model contains design enablers that practically shape agile teamwork. The ABC predictors are mainly based on Burke's team adaptation theory while the design enablers link to the technical part of the socio-technical systems theory (Malik and Orr, 2022; Pasmore *et al.*, 1982). This latter theory emphasizes a) a balanced and integrated socio-technical configuration of the system (called "organization"), b) that both subsystems should be open and responsive to their environment and c) the principle of requisite variety: a systems control mechanism must be as diverse as the complexity of the environment it operates in (Burke *et al.*, 2006; Emery and Trist, 1965; Pasmore *et al.*, 1982; Malik and Orr, 2022). The social subsystem comprises control structure, and actors and the technical subsystem comprises of technology and tasks (Malik and Orr, 2022), for example, using of tools, techniques, devices, machines, methods, procedures, knowledge, technology, automation, artifacts, processes and the physical environment required by the work team (Malik and Orr, 2022).

The Design enablers in the HEAT model align with the technical subsystem (through the provision of technology and task routines) that allow agile teams to function effectively, reinforcing the mutual interdependence between technology and the more social ABC predictors (Pasmore *et al.*, 1982). Concrete examples are the introduction of a specific team design related to how task are structured and delegated through the use of agile project management tool Jira, an industry standard for Scrum/Kanban boards for backlog management. This may for instance moderates the way team members collaborate and balance their contributions. Further, the introduction of SAFe Framework templates (as part of the predictor Operating framework and procedure) that significantly acts as shared mental model and impacts how teams interact. Third, the Digital workplace and infrastructure predictor may constitute using (cloud based) communication tools/apps to support agile teams' faster, hybrid and more effective collaboration.

Altogether, the HEAT model seems relevant but has not yet been examined in practice. This study therefore involved agile experts (both scholarly and practice-oriented ones) as well as agile team members themselves to reflect on the effective predictors with the aim to enrich the theory and improve its applicability and generalizability.

3. Method

3.1 Research design

The study is positioned as a qualitative mixed-methods design because the qualitative component serves as the primary lens for generating insights, whereas the quantitative or structured elements only play a supporting role, supplementing the main qualitative theoretical foundation (Johnson *et al.*, 2007). The choice for qualitative mixed-methods research was made as it ensures deep and rich theoretical descriptions of complex organizational phenomena, such as exploring how team effectiveness occurs with the necessary nuance (Gioia *et al.*, 2013). Further, multiple types of qualitative data enables

triangulation and integrating complementary perspectives to enhance the external validity (Edmondson and McManus, 2007).

Round one consisted of surveys and semi-structured interviews with individual agile experts to identify key themes later explored in a second round which entailed pilot interviews, a survey and group interviews with agile teams. This sequence enabled us to first identify potential missing predictors in the original EAT model through the agile expert interviews, which helped the preparation of two pilot interviews at an agile meetup and then, the survey and agile team interviews. While there is no universally agreed-upon standard for sample sizes in qualitative mixed-method agile research, our study design is consistent with comparable exploratory studies in the agile field, for example Moe *et al.* (2021), Malik *et al.* (2021), Ramírez-Mora *et al.* (2020), Gren and Lenberg (2018), Bjørnson *et al.* (2018) and Mikalsen *et al.* (2019).

3.2 Sampling procedure and sample description

For round one, an expert sampling strategy was followed to invite five associate and full professors with a high level of agile expertise to review the EAT model and to verify its credibility (Douglas, 2022). We also selected five senior agile practitioners with more than 15 years of agile experience. Their deep knowledge of agile positioned them well to evaluate the EAT model's practical relevance and applicability as well as determine any missing predictors. We met two of them at the agile Alliance XP2023 congress in Amsterdam, The Netherlands. Two others were part of the first author's personal agile consultant network and the fifth was highly visible on LinkedIn, frequently posting about agile team effectiveness. All 10 agile experts regularly visited (academic) agile conferences and/or published on the topic.

For round two, we pilot-tested the group interviews by facilitating two workshops at the Dutch agile community meet up "Smarter Together" of large Dutch companies. 25 Scrum Masters participated in this pilot. Based on the pilot test, we updated the definition list of the EAT predictors by synthesizing and integrating the conceptualizations provided in the papers included in the original systematic literature review. Providing clear definitions enhances validity by reducing potential misinterpretation among respondents and thus strengthening the reliability and credibility of the findings. This top-down approach allowed targeted exploration of the predictors, already identified as potentially influential, while still leaving room for emerging insights through open-ended discussion during the group interviews. For the group interviews, we selected six agile teams embedded in the IT department of a large semi-public transportation firm in The Netherlands. We consulted the Head of Technical Projects who then introduced us to the Functional Lead Methodological Working to recruit agile teams. An information pack was distributed among all agile teams of which the Functional Lead selected a mix of six high and low performing agile teams. The selected agile teams varied in size (between eight and 12 with one exception of a team with 16 team members) and consisted mainly of engineers. All teams included a Product Owner (PO) and five teams a Scrum Master. The participants' agile work experience varied from two months to 15 years and consisted of in total 14 women and 56 men with a higher educational level. The participating teams were considered to be agile because (a) agile and adaptation was a key part of the organizational strategy; and (b) the Head of Technical Projects and the Functional Lead Methodological Working confirmed that the participating teams were agile teams.

3.3 Data collection

This section describes the steps in the data collection in two rounds (see, also, Figure 2). The data collection was approved by the ethical committee of our University (request number:

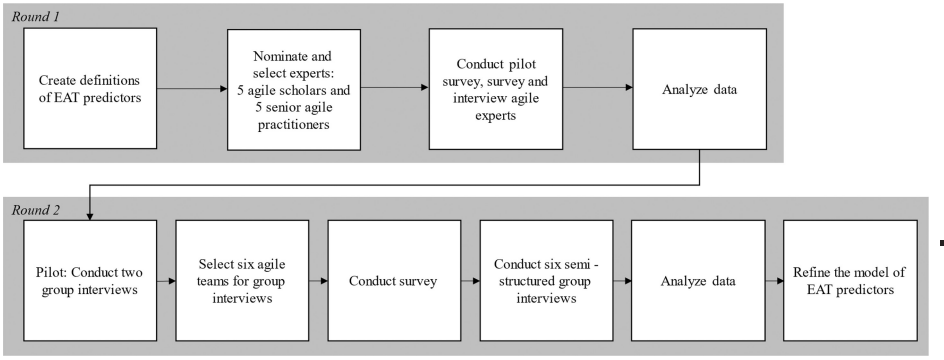

Figure 2. Steps in the data collection
Source: Authors' own work

230355). To safeguard ethical research procedures, we obtained informed consent and ensured data confidentiality, and participant's anonymity, throughout the study.

3.3.1 Round one: expert interviews. Prior to the interviews, the ten agile experts filled out a brief survey about the predictors in the EAT model via Qualtrics. This survey was first piloted among three team leads; their responses were not included in the analyses. As we noticed that their answers (on a 7-point Likert scale from 1 = almost never true to 7 = almost always true) showed little deviation, we added an eight point: always true, to get more distributed answers. This change was intended to enhance the discriminatory power of the response scale, thereby improving the validity by capturing respondent's opinion in a more refined way. A smaller Likert scale reduces the ability to conduct a nuanced analysis, as it limits the range of variability in responses and may compress standard deviations. The first question was: "Please react to all 22 predictors to the degree in which they positively contribute to EAT". This way the participants could read the definitions of each predictor and ask clarifying questions during the consecutive interviews. Second, they ranked the predictors: "What are the five most essential predictors, out of 22, that predict EAT?" Third, we asked them for any missing predictors.

Then, we held one-hour interviews with the ten experts (two face-to-face and eight through Microsoft Teams). The goal was to gather interviewees' reflections on their answers to each of the questions. The audio recordings were transcribed.

3.3.2 Round two: group interviews. We facilitated two pilot group interviews at a Dutch agile meetup, prior to conducting the group interviews, which taught us that we overestimated agile workers' understanding of each predictor's meaning. Hence, we developed an interview guide, a presentation and a handout with definitions for each predictor to facilitate the next six group interviews.

An invitation email (including the request to take the same Qualtrics survey as in round one) was sent to team members prior to the group interviews. The aim was to enable data triangulation by using the survey data in the group interview. Also, it allowed the non-expert teams, who might have limited familiarity with the ABCD-specific terminology, to familiarize themselves with the predictors through providing the definitions for each of them. This also enabled a more effective structured group interview to ensure that the terminology used were understood and discussed in depth (Creswell and Plano Clark, 2018).

The audio-recorded group interviews consisted of three parts. The first part included an introduction round, a 2-minute presentation of the EAT model and the survey outcomes. Although the brief presentation of the model could have introduced a source of bias, its introduction also appealed to the participants' explicit request for theoretical grounding. To limit any potential response bias, we deliberately included opportunities for participants to challenge, reject, or to add predictors to the EAT model by asking if there were any predictors missing throughout the group interviews.

Second, the first author asked to form pairs and to select two prominent and critical predictors that are for each of the team members to be essential for achieving EAT. The decision to introduce predefined ABCD predictors was made to ensure theoretical understanding, while still leaving room to select specific (and new) predictors to discuss, so specific insights could emerge. This approach combines theoretical rigor with practical relevance and facilitates triangulation, bottom-up enhancing the validity and efficiency of the research process (Creswell and Plano Clark, 2018).

The pairs engaged in dialogues and wrote down quotes from their daily practice for each selected predictor on sticky notes. To conclude this part, the results were discussed in a plenary round to retrieve additional team feedback. In the third part, the pairs discussed the greatest challenges (or obstacles) the team members experienced as an agile team in relation to the listed EAT predictors.

3.4 Data analysis

All 16 interview transcriptions were analyzed through ATLAS.ti, following Strauss and Corbin's (1990) open, axial and selective coding phases (Ketokivi and Choi, 2014). This involved immersing oneself in the data, reading and digesting the data to develop initially 509 code labels, which were then discussed between the first and second author (Azungah, 2018). More precisely, the first author followed an inductive ground-up approach to coding the data guided by the language used by the interviewees to find patterns in the data (Gioia *et al.*, 2013). We began the analysis by identifying initial concepts, using terms rooted in the respondents' quotes (first-order codes) from the transcribed interviews. In the second consecutive axial and round of selective coding, second-order themes were developed that partially corresponded with partially theory-based (sub) dimensions. We were going back and forth between the literature and our emerging data structure (Magnani and Gioia, 2023). The code labels (of second order themes) were related to the predictors in the EAT model (Bastiaansen, 2024) to answer the research question and presented in a data structure (Gioia *et al.*, 2013; Magnani and Gioia, 2023).

In addition, the survey data were analyzed using simple statistics (means and standard deviations and the top 5 ranking of the predictors). Next to overall scores, we also distinguished the three participant groups: scholars, senior practitioners and members of agile teams. Although not every team member filled in the survey 57 of them did so (81% response rate). As agile is grounded in egalitarian principles, the data from every survey were considered equally valuable.

4. Results

4.1 Exploratory survey findings

Although our analyses were primarily based on the qualitative data based on the open-ended interviews, to support the identification of patterns in the data, we also explored the surveys using simple statistics. The three participant groups seemed to be quite agreeable in their assessment of the predictors. Table 1 shows that communication and mutual trust were deemed by all respondents to be most positively contributing to EAT by all respondents

Table 1. Exploratory survey findings, comparing the three interview-participant groups ($n = 57$)

	Total 3 groups ($n = 57$)		Agile scholars ($n = 5$)			Agile practitioners ($n = 5$)			Members of agile teams ($n = 47$)		
Predictors of effective agile teams	Mean	RS	Mean	SD	Top 5	Mean	SD	Top 5	Mean	SD	Top 5
Affective predictors											
Mutual trust	7.2	2	7.4	0.5	1	7.6	0.8		7.1	1.0	2
Team cohesion	6.5	6–9	6.6	0.8		6.8	1.2		6.5	1.3	5
Psychological safety	6.9	3	6.2	0.4		7.6	0.5	1	7.0	1.0	5
Team diversity	6.0	18	5.0	0.6		6.0	1.4		6.1	1.4	
Team orientation	6.3	11–12	6.4	0.5		5.4	2.2		6.4	1.1	
Behavioral predictors											
Communication	7.3	1	7.4	0.5	3	7.6	0.8	3	7.2	0.8	1
Back-up behavior	6.8	4	6.8	0.4		7.4	0.8		6.7	0.9	
Balance of member contributions	6.1	16–17	6.4	0.5		5.2	1.9		6.1	1.0	
Coordination	6.5	6–9	6.4	0.5		6.0	2.5	3	6.5	1.2	
Shared team leadership	5.7	20	6.4	1.0	5	7.0	0.9		5.5	1.5	
Collaboration	6.5	6–9	6.6	1.0	1	7.4	0.5	3	6.4	1.1	1
Conflict management	6.5	6–9	7.0	0.9		7.0	1.3		6.4	1.2	
Team innovation	6.1	16–17	5.2	0.7		6.0	1.7		6.2	1.1	
Team modification	4.7	22	4.2	0.7		4.4	1.9		4.8	1.6	
Cognitive predictors											
Clarity goal and role	6.2	13–15	6.6	0.8	5	6.6	1.2	3	6.1	1.5	
Team autonomy	6.3	11–12	6.2	0.7	5	6.8	1.2	1	6.3	1.3	3
Shared mental models	6.2	13–15	6.0	0.6	3	5.6	2.1		6.3	1.2	
Closed-loop communication	6.2	13–15	6.4	0.5		6.8	1.6	3	6.1	1.4	
Team situation awareness	6.4	10	5.8	0.4		6.8	0.7		6.4	1.3	

(*continued*)

Table 1. Continued

Predictors of effective agile teams	Total 3 groups ($n = 57$) Mean	RS	Agile scholars ($n = 5$) Mean	SD	Top 5	Agile practitioners ($n = 5$) Mean	SD	Top 5	Members of agile teams ($n = 47$) Mean	SD	Top 5
Enablers											
Team design	5.8	19	5.8	0.4		5.8	1.6		5.8	1.4	
Operational framework and procedure	5.4	21	5.8	0.4		5.0	1.3		5.4	1.3	
Digital workplace infrastructure	6.6	5	5.8	1.2		5.2	1.9		6.9	1.0	

Note(s): The predictors are presented in the order of the HEAT model (Figure 1). The mean and s.d. are based on an 8-point Likert scale: 1 = almost never true, 2 = usually not true, 3 = rarely true, 4 = occasional true, 5 = often true, 6 = usually true, 7 = almost always true and 8 = always true. The ranked score (RS) (in column 3) is based on the mean. The Top 5 ranking results are based on an additional ranking order exercise (not related to the mean)

Source(s): Authors' own work

($\mu > 7$). This top score was followed by psychological safety, backup behavior and digital workplace infrastructure (μ between 6.9 and 6.6). Most other predictors were identified to be usually related to EAT (μ between 6.0 and 6.9). Team modification only "occasionally" contributes to EAT ($\mu = 4.7$) and was thus not seen as a key predictor of EAT.

In terms of the ranking exercise, each respondent group's top 5 included "team autonomy", whereas they at the same time scored it as only "usually contributing" to EAT ($\mu = 6.3$). Thus, teams seek team autonomy to design, test and maintain their work themselves (Van Solingen, 2018), whereas it is not considered to be one of the most important EAT predictors. Second, while scholars ranked shared team leadership in their top 5, the team members disagreed and gave it a relatively low score in relation to EAT ($\mu = 5.5$). Third, the design enablers received somewhat lower scores, except for digital workplace infrastructure, which was ranked higher by agile teams than the experts, given that some regularly experienced frustration to solve technical issues with their infrastructure.

4.2 Qualitative findings

Below we present the findings based on the open-ended (group) interviews, as shown in Figure 3, illustrated with quotes from the five senior agile practitioners (hereafter: "PracX"), five agile scholars (referred to as "ScholarX"): both researched groups typified as experts, and six agile teams (i.e. "TeamX").

As the most essential EAT predictor was noted *communication* (Table 1). Team communication must be transparent, clear and direct. Such communication fosters solid relationships within the team and the challenge is "to find a balance between direct contact and communication between our IT team and the business teams [client]" (Team6). Communication also prevents frustration by ensuring a shared understanding about actions and intentions (Team2). "Effective communication is seeing each other's points of view, engaging everyone in the process, not being afraid to challenge and to have some fun" (Scholar5). The experts and teams observed much overlap with the predictor *closed-loop communication*. Team4 saw the additional "closed loop" component as "actively and continuously seeking feedback and confirmations on, for example minimal viable products in sprint ceremonies". "A lack of this predictor can lead to wrong solutions" (Team1). Closed-loop communication is not applied properly in less EATs though: "In retrospectives, people do not give feedback to each other, they gossip about each other […] not that beneficial at all" (Prac1). It was also a challenge to execute tasks which lack visual artifacts for software engineers to work on. Team6 stated: "Getting feedback from users without being 'live' (to see the product work in action) is very difficult". In other words, various (closed-loop) communication-related aspects seem to be essential for EAT.

Mutual trust was scored second highest (Table 1). Every respondent felt it was important, though the word trust meant different things to different team members. Some referred to the fact that trust is something one has in advance, whereas others viewed trust had to be earned or *deserved* in time by *delivering the job*. Furthermore, the mutual aspect was not overtly apparently for all respondents. Mutual trust encompasses an aspect of predictability. A member of Team6 stated: "The longer our team is in place, the more confidence in each other grows, which benefits the quality of the work and the team atmosphere". Yet, Scholar1 warned that agile team members that trust each other for a long time, might have strongly engrained patterns, which may not allow them to perform their roles optimally continuously.

The third ranked predictor positively contributing to EAT is *psychological safety* (Table 1): a safe and supportive environment to support interpersonal risk taking. Agile team members must be open about failures and fears, show vulnerability and discuss team members' negative behaviors (Prac2). Leadership behavior and external factors strongly

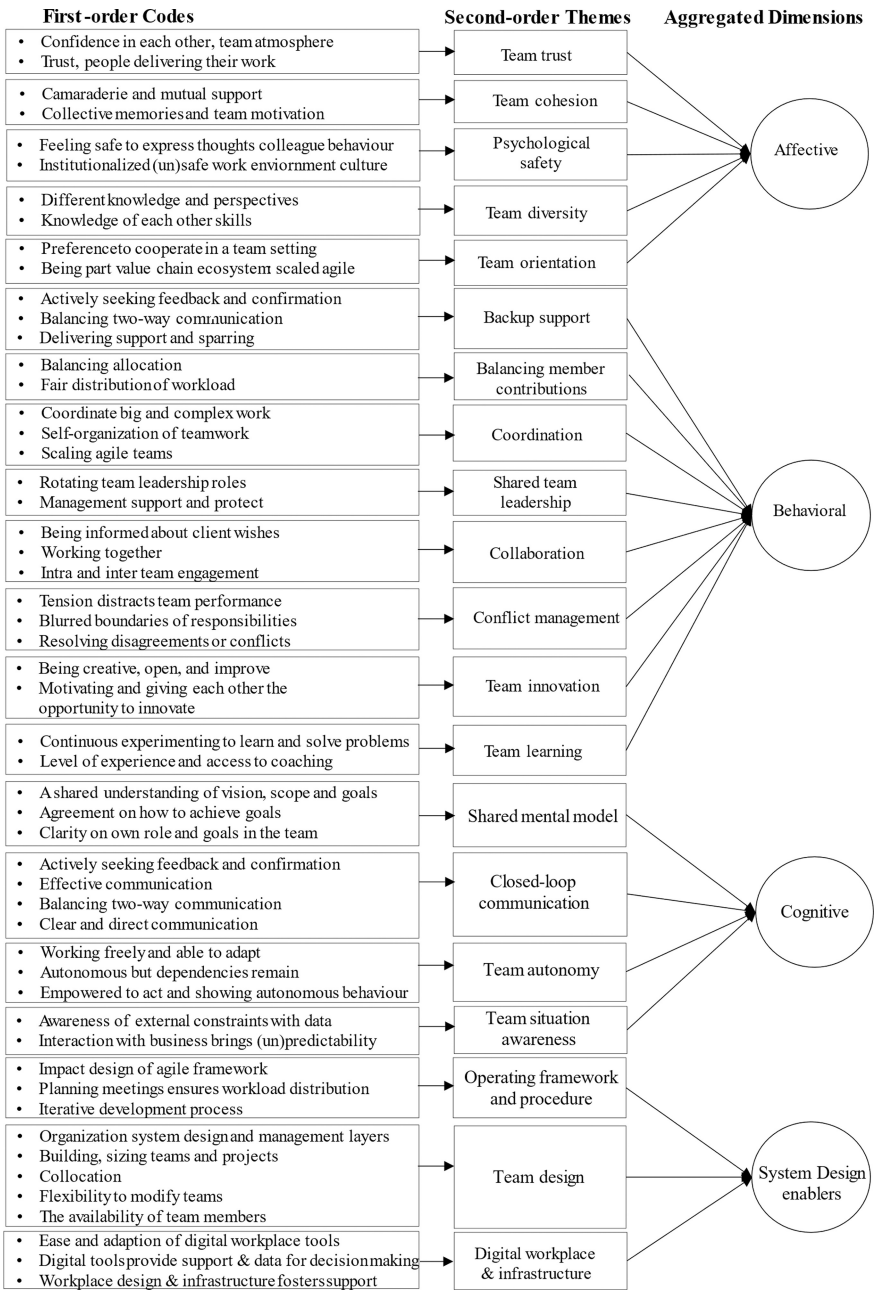

Figure 3. Data structure
Source: Authors' own work

determine whether teams feel psychological safe (Team4): "Agile teams can only work effectively without feeling pressured or stressed by their supervisors" (Scholar5). A counterproductive "blaming culture" (Prac4) and having "territorial discussions about who should own a task" reduces the time to discuss opportunities (Team4) and, therefore, hinders agile team performance.

Scholar2 was not fully convinced about the need on *backup behavior*: "Agile teams can survive without backup behavior". The word "support" found a better ground among all the participants, as they interpreted the delivery of (mutual) support as "assisting colleagues in sprints" (Team6) and "taking over each other tasks" (Prac2). For Team2, the alternative term backup behavior was perceived as common sense: "There is a higher quality of work when people are sparring".

Although *digital workplace infrastructure* scored relatively high, teams were more convinced of its importance for EAT than experts (Table 1). According to Prac3, "digital tools, such as generative AI and infrastructure are essential for the design of the solution, for backlog management, to monitor the progress of work and to collaborate". Prac4 expressed that this predictor is only supportive "if it delivers value to the customer and is adopted by the users". Prac2 added: "The more digital tools we implement, the bigger the risk that teams are not bonding". But unlike the previous results, this predictor caused lively dialogues during group interviews. "We constantly complain about improvements that can be made" (Team4), including "bureaucratic ticket logging processes and limitations on authorization rights" (Team5). "When technology doesn't work you are angry […] if it works you say nothing" (Team3).

In teams showing a strong *cohesiveness*, respondents typified it as camaraderie and observed that people support each other no matter what: "team members know each other's qualities and weaknesses" (Prac4). Team cohesion does not imply consensus in decision making though, group members noted it might lead also to mediocre performance. Sharing ideas for problem solving and then making a team decision strengthens team cohesion, even if it later shows to be the wrong decision (Team1). Team cohesion can be achieved through sharing "collective memories" (Scholar5), "having fun and creating a positive team spirit" (Team3) and "having a good atmosphere where we can share jokes" (Team1). Yet, "ego, pride, career development and money are primary individual motives of team members and can hinder team cohesion" (Scholar1). Furthermore, an "us versus them mentality between testers and developers and on-site and remote workers" in a team is not supportive (Prac4). Indeed, "an insider-outsider group mentality […] leads to a mindset in which it is very difficult to develop trust" (Prac2).

Related to *coordination*, EATs were assumed to be self-managing. A member of Team6 mentioned: "We always actively search for work (in the backlog) because there is always something to do". Coordination is especially needed "to coordinate big and complex work, with cross-cutting features and involvement of multi-cultural teams" (Scholar4). To coordinate complex and large scaled agile work among multiple teams, EATs use agile portfolio management (Scholar1) and frameworks such as SAFe (Prac3).

When it comes to *collaboration* (with clients), Team5 regularly surveyed their customer wishes and "had regular physical meetings with customers to be informed about their preferences". This focus on customers and the business is often represented by the role PO. All participating teams struggled to collaborate with clients for various reasons: "The ideas of the business do not always match with our developers' work experience on the solutions" (Team4) and "it is not possible to contact them as they are unavailable to us and have a lack of interest in our technical work" (Team1). Thus, for optimal collaboration the Product Owner (PO) role is important to ensure agile team members deliver tasks that are accepted by

the business. When it comes to intra-team collaboration, "the more tasks in a sprint, the more difficult it is to collaborate as we then need to work [in small sub teams] on more separate and smaller tasks" (Team4).

The predictor *conflict management* was absent from team discussions and in any of their retrospectives. A less effective teams noted that the PO delegated tasks to individuals to avoid team responsibility discussions. Another noted example is "ignoring to accept an assignment from the business as it seemed to be inefficient" (Team5). The PO of that team stated: "The conflict is still ongoing, meaning that we have no management [policy] how to deal with this" and "yet, we like to strive for harmony". The highly effective Team4 stated: "To resolve technical conflicts, we direct team members back to standards and Wiki" and "we do not have personal conflicts; we have a mentality to respect each other". Nevertheless, Team4 also mentioned: "Sometimes there are some discussions". One of those team members believed that "without friction there is no shine". Thus, task conflicts (as opposed to relationship conflict) seems to be important for EAT, although too many tensions were admitted distracting from reaching high team performance.

Although the predictor *team situation awareness* was deemed less important by the scholars (Table 1), the teams underlined its importance. Team1 stated their awareness that the "finance department's [business] traditional ways of working is conflicting with our agile way of working culture model". To embed agile ways of working throughout the organization, Scholar1 advised to shorten sprint cycles and improve effectiveness by positioning "agile teams as close as possible to the client and the goal that needs to be achieved". Indeed, Prac1 noted that "Management should listen to engineers on the ground to be aware of the situation". Scholar 4 found "it important to find a way to track and measure data on team's performance that arise through changes in policy, alteration of tasks and shifts in the wider organization".

Also, *team autonomy* was seen as an important EAT predictor. Team6 confirmed that: "In our team, we have the freedom to choose what and how we make our products and services". The highly effective Team1 struggled with this team dynamic, though: "We balance autonomy and 1:1 directives [of the PO], because working autonomously is time consuming [to decide who does what in a team]. Though individuals working on a solution solitary [given by the PO] risk lacking the [team's] support for their work". Most agile experts and teams also did not see a lot of autonomy in practice. Thus, team autonomy does not seem to be achieved easily.

An affective predictor that was discussed less frequently concerned *team orientation*. Team members frequently asked us to explain this predictor and how it differed from team cohesion. According to Prac2, team orientation refers to a group mentality with a preference to cooperate in a team setting. Team4 referred to it as "working together formally and informally while having some fun". This team orientation helps to "achieve team goals rather than individual preferences" (Scholar5) and teams should optimize "their own part of the work, as they are being part of the value chain, an ecosystem of scaled agile" (Scholar3).

All teams confirmed that having a *shared mental model* is crucial as it "brings motivation" and "a clear picture where we are heading at" (Team4), for instance the vision, scope of work and goals. "A shared mental model are our team fundamentals" (Team5). A shared mental model also needs to be adaptive: "It is the result of a continuous evolving process that needs to adapt to market trends, customer needs and own company targets" (Prac3). It can be challenged by agile workers because a shared mental model might "hinder team effectiveness because there is a need for different views to bring the best results" (Prac1).

In line with this, "clarity" aspect that is part of the original separate predictor *clarity on roles and goals*, can be seen as a necessary component to share a shared mental model of teams' vision, scope and goals (Prac2 and 4). Also, Scholar4 noted: "What you need to do within the team needs to be clear" to achieve team goals and objectives. Prac2 stated: "A lack of clarity in roles tends to lead to confusion in decision-making". For example, there were many different views on the PO role and how the role was performed. In Team4 and Team3, the PO had a more traditional leadership style, which resulted in informal leadership (Team4) and more project leader type of work distribution in Team3: "The role of our PO was diffuse and results in priorities [of backlog items] being delegated to our developers and testers". Hence, clarity on own team roles' responsibilities is key to build a shared mental model.

There were mixed findings on *balancing member contributions* to gain agile team effectiveness (Table 1). "The workload often lies within one certain sub-group" (Team6). Some participants preferred a practical approach to allocating work "to get the job done" above work happiness (Team3). One of the less effective teams noted they regularly had a misbalance in allocated sprint-related tasks, although they did not mind. A member of Team2 stated: "The two-weekly sprint planning factors in the capacity and preferences of team members to ensure they can work on their preferred tasks and a fair workload distribution".

Team innovative behavior was seen twofold:

(1) as a team process related to thinking, being creative, open to new ideas and to experiment purposefully, and

(2) bringing innovative solutions.

Team1: "We explore other paths to continuously improve the quality of our solutions […] for instance by listening to software vendors" (Team1). A Team4 member mentioned: "We need to have a kind of boy-scout mentality to take an issue or risk, to work on it to improve and to make it better than we originally found it". Innovative behavior was also related to being motivated, as it "gives each other the opportunity to explore new solutions even if the duration and the outcome is uncertain" (Team3). Thus, innovative work behavior was embraced also as an EAT predictor.

The *team diversity* predictor was interpreted differently: some referred to it as team members with different national cultural and cross-functional backgrounds, whereas in Team4 it was also seen as possessing diverse "expertise, skills, work experiences and stakeholder networks". The (right) amount of diverse skills depends "on the size of the systems and applications that needs to be used" (Team4). Moreover, Prac1 stated that diversity is a necessity to innovate. Yet, teams are not always composed with diversity in mind: "An agile team that is developing a marketing product consists of all marketeers" (Scholar3). Similarly, the Scrum Master of both Team3 and Team6 noted: "Our team members have the same profile, so they have the same blind spots". Scholar4 added: "An ideal team design depends on the match in capabilities to the context in which it operates to deliver the end-to-end functionality". Scholar1 noted: "Large and complex projects are doomed to fail, while small projects - given to smaller teams (often with younger project leads) are more successful due to the smaller size and complexity of the tasks they are given". The highly effective Team4 had established sub teams which collaborated and frequently rotated within the team, depending on the programs and the IT systems they work on. Also, the highly effective Team6 showed adaptability by adjusting their team composition when needed while highly effective Team2 stated: "We do not work on an island, we have shared responsibilities".

Experts found that *shared team leadership* almost always contribute positively to EAT, although it "is kind of undefined at the moment" and "assumes that everyone is completely

equal" and leadership shifts depending on their [required] expertise and what is needed at that moment" (Scholar2). Nevertheless, Prac3 and five of the six participating teams did not experience this predictor in real life: "Management needs to empower teams, for instance to make own decisions and teams need to have the capability to translate this empowerment to their own team functioning" (Prac3). Only the highly effective Team4 adopted shared team leadership, for some tasks: "We rotate team leadership to facilitate the daily standup, retrospectives, in demos and to communicate with our community". Thus, although this predictor gained scholarly attention, it seems not widely applied. It may also be because the interviewees referred to shared leadership using many different terms, including rotation, collective leadership, situational leadership for coordinating small activities, self-leadership, functional team leadership for taking on roles based on own expertise and experience for tasks on the project. The common denominator was that leadership should always occur by mutual agreement, with individuals having the autonomy to choose whether to engage in tasks, or not.

Using an *operating framework and procedure* is common for agile ways of working. Yet, when executed badly, it can also hinder teams. Prac4 explained: "The organization structure and the bad set up of the SAFe framework make people work in silos and therefore the development cycle takes much longer". Team2 stated that "our current framework [of Scrum embedded in SAFe] creates a lot of unnecessary consultations and fragmented responsibilities". Scholar3 explained that "imposing a framework can be counterproductive as it is more logic to give people a choice from a variety of frameworks or settings such as Scrum, SAFe or Kanban". Scholar4 summarized it: "The challenge is how to use a framework effectively".

Finally, both the experts and agile teams found it occasionally true that *team modification* contributes to EAT (Table 1). Team4: "Rotation of team members brings changes in team dynamics […] insecurity about team knowledge […] and we lose knowledge". The lower effective Team5 struggled with their new team composition: "Our new folks are still not up to speed after three months" and "we are thrown back to the norming phase, discussing how we will collaborate". A member of Team3 noted that "modification is less needed when teams have flexible roles", including "a willingness to take on a broad range of responsibilities and sharing knowledge" (Team6). Scholar1 noted that an agile team composition depends on external factors: "Budget cycles and changing strategic priorities". Prac5 flagged that "gradual restructuring the team brings noise which is good for a team which works together for a longer period." Hence, team modification may have a negative impact on agile team effectiveness.

4.3 Contrasting views among the three researched groups

A comparative analysis among the three groups showed little deviation during both the interviews and surveys. All themes identified in the qualitative analysis were supported by quotes from different groups. Also, further exploring their ranking of the predictors in the EAT model highlighted four predictors with relatively large mean difference, namely: shared team leadership, psychological safety, team diversity and digital workplace infrastructure (see, Table 1).

First, agile team members regard *digital workplace infrastructure* as a fundamental design enabler of effective team collaboration, communication and task coordination. Conversely, experienced agile professionals and scholars tended to conceptualize the digital workplace as a supporting infrastructure, often merely assuming its availability. This divergence reflects a contrast between operational perspectives and more strategic or theoretical viewpoints. Second, the agile team members ranked *shared team leadership* as

less critical as their focus lies more on task execution and their Product Owners delegated short-term-delivery goals. Instead, the mature agile experts may have emphasized this more, because they typically have a deeper understanding of how distributed leadership fosters autonomy, accountability and team learning, which are essential for sustained team effectiveness (Gren *et al.*, 2020). Third, agile scholars may attribute comparatively less significance to *psychological safety* and *team diversity* due to their predominant emphasis on structural and procedural dimensions of team functioning that lend themselves to quantifiable analysis and generalization (Edmondson, 1999). Instead, agile practitioners observed its tangible impact on psychological safety daily in their team communication and may thus have placed more emphasis on this element. Similarly, the agile practitioners emphasized *team diversity* as a critical enabler of creativity, and problem-solving in their day-to-day agile work (Moe *et al.*, 2010). Despite these few differences though, the three groups were quite aligned.

4.4 Missing and renaming predictors

We also examined whether there are any missing predictors in the EAT model. While our findings did not introduce entirely new predictors to the existing model, they do offer empirical refinement and validation of its ABCD components. It was noted that the learning loop should be a full-fledged EAT predictor. The findings from the forced ranking exercise led to rename "learning" to "team learning". Scholar1 stated: "Agile is in its essence structured experimenting, short cycles of learning by delivering teamwork". "Constant joint learning should be a standard mindset of team members to continuously improve" (Prac1). "Agile teams want quick learning" (Prac4). We categorized team learning in the behavioral category given that the interviews mainly pointed to behavioral forms of learning such as questioning itself to make and implement improvements, including gaining new skills and applying learnings collaboratively to solve problems and support each other's growth. "Teams that have well-organized feedback loops, learn continuously and thus improve their work […] and are more likely to survive in dynamic environments" (Prac4). Burke *et al.* (2006, p. 1192) put team adaptation as a key dependent variable that serves "as both proximal outcomes and inputs to the adaptive cycle". So, in our effort to refine the model, we renamed the loop in the EAT model to team adaptation. Also, because when teams and their members go through multiple iterations, this helps them to quickly and effectively adapt to the needed collective sensemaking (Thommes *et al.*, 2024).

5. Discussion

This study explored a set of agile team effectiveness predictors identified in a comprehensive systematic literature review (Bastiaansen, 2024). We collected the experiences and opinions of agile experts and the members of both highly effective and ineffective agile teams. As agile practices have evolved globally since the launch of the agile manifesto in 2001 (Dikert *et al.*, 2016), and agile frameworks and processes have been trained and implemented widely, there is now an increasing need to better understand the social factor: what makes agile teams become more effective. In what follows, we elaborate on the theoretical and practical implications of the findings as well as the limitations of this study and areas for future research.

5.1 Theoretical implications

Based on our findings, a restructuring and redrawing of the original conceptual EAT model was needed and presented in Figure 4. First, we introduce a new model visualized after the infinity symbol or lemniscate which illustrates the need for a continuous process, balance and

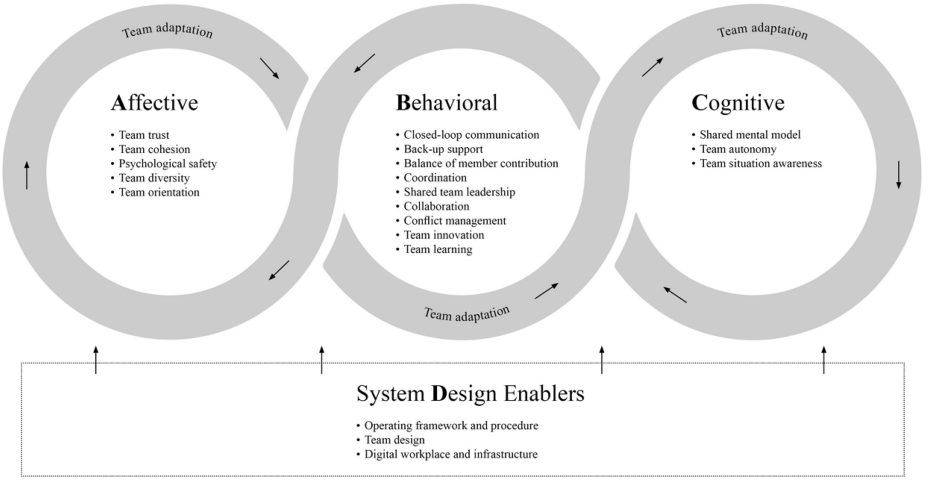

Figure 4. Refined model of effective agile teams
Source: Authors' own work

interaction between the elements in enabling agile team effectiveness, to support iterative development, learning and endlessness improvement. This updated drawing captures the dynamic agile team functioning much better than the original EAT model as well as other IMOI type drawings of agile team effectiveness models (Steegh *et al.*, 2025). Second, we integrated the predictors closed-loop communication and communication. Agile ways of working, by definition, emphasize the loop of seeking feedback, to follow up and gain recognition of work to achieve customer and employee engagement (Burke *et al.*, 2006; Peeters *et al.*, 2022). Agile team members need to ensure that their intended message has been understood (Salas *et al.*, 2005). We see closed-loop communication to be perceived and treated as a main and integral part of regular agile team behavior and propose to give this predictor a more central place in the EAT Model.

Third, we refined the EAT model by integrating the clarity on roles and goals predictor into the shared mental model predictor in the cognitive category. Having a shared, common understanding of goals, tasks, processes (including work agreements) and a common understanding of the product are sub-components that can foster team effectiveness (Strode *et al.*, 2022; Uitdewilligen *et al.*, 2018). A shared mental model is "an organizing knowledge structure of the relationships among the task the team is engaged in and how the team members will interact" (Salas *et al.*, 2005, p. 561). In agile practices it results, among others, from adopting common agile practices and having the customer on site, for instance during sprint reviews to gain feedback on demonstrating (half) products. Clarity and a shared mental model are thus related and have been integrated.

Fourth, although mutual trust is the bedrock for fostering affective team dynamics, this predictor was subject to multiple interpretations and raised questions among the respondents. Whereas some participants have an initial level of trust in the team (until the team demonstrates incompetence, unsupportiveness or disrespect), others said trust must be achieved during team engagements (Salas *et al.*, 2005). Also, the mutual, reciprocal aspect was new for many agile team members. Having mutual trust brings emotional security and stability and can have positive effects on performance, attitudes and team atmosphere

(Wong and Law, 2002). Therefore, to express this important team aspect in the EAT model, we decided to relabel mutual trust into team trust. This important affective predictor is known to be related to many team predictors. For instance, one's level of information sharing and willingness to admit mistakes and accept feedback (Salas *et al.*, 2005) as well as the existence of a supportive team social climate (Strode *et al.*, 2022). Given that this predictor is still rather unexplored terrain within the context of agile teams, team trust clearly does need more scientific and practical attention.

Fifth, based on this validation study, one may question whether "team modification" is truly functional to becoming a highly EAT (Šmite *et al.*, 2020). The participants in our study felt this predictor only occasionally contributes to EAT and ranked it the lowest. Also, the SLR on which the original model is based (Bastiaansen, 2024) already questioned whether this predictor would contribute to EAT or would in fact act as a hindrance. In Burke *et al.*'s (2006, p. 1201) team adaptation theory, it is noted that "an adaption, as carried out via modification of a team structure, is functional if it ultimately contributes to the maintenance or development of the larger whole". Hence, too much modification of agile teams is not to be preferred, as their projects are built around a team of motivated individuals that work together every day, for a longer period (Beck *et al.*, 2001). Given that research has showed that team attrition and job rotation occur, also in agile teams, modification cannot be ignored. In refining the EAT model, we therefore integrated this factor into the enabling predictor "team design". Furthermore, the difference between the affective predictors team cohesion and team orientation was challenged by the participants. While both predictors are somewhat related, conceptually, they are also distinctive (Salas *et al.*, 2005). Team cohesion is about the quality of the relationships, work motivation, to have a good team spirit and a desire to work within a "cohesive unit of professionals" (Schwaber and Sutherland, 2020, p. 5; Whitworth and Biddle, 2007). It is thus different from workers' team orientation, which entails workers' general preference to work in team settings (Salas *et al.*, 2005; Strode *et al.*, 2022). Hence, we kept both predictors in the renewed EAT model (Figure 4).

Next to the refining the original EAT model, our findings also highlight agile teams' struggle to balance their levels of team autonomy, task autonomy as well as the team's self-empowered behavior. Autonomy and a team's capability to manage one's own team is beneficial but also a complex theme: the question of how much autonomy should be given to agile teams is an open debate (Moe *et al.*, 2021). Especially in large scale agile environments, where inter-team coordination with adherence to an organization program or portfolio, teams must sacrifice some level of autonomy as they have, for instance limited choices of the features to work on, development, testing and integrations needs more inter-team coordination, better long-term decision making, giving and receiving support, communication etc. (Dikert *et al.*, 2016; Gustavsson *et al.*, 2022; Šmite *et al.*, 2023).

Finally, Burke *et al.*'s (2006) model includes, next to team characteristics, also characteristics at an individual level. The more comprehensive ABC set of team dynamics of the herein renewed EAT model could be integrated in Burke *et al.*'s team adaptation model. After all, their model aims to "constitute core processes and emergent stated underlying adaptive team performance and contributing to team adaptation" (Burke *et al.*, 2006, p. 1189). Burke *et al.*'s (2006) leadership element resonates with shared team leadership behavior in agile team theories, which is in its essence an adaptive practice (Thommes *et al.*, 2024). So, Burke *et al.*'s (2006, p. 1189) theorizing, with "theoretical roots in the cognitive, human factors and industrial-organizational psychological literature", could benefit from the learnings of our team effectiveness research: to make it more of a comprehensive (agile) team theory (Ferrario and Winter, 2023).

5.2 *Practical implications*

This study offers actionable insights. Also, agile team effectiveness holds broad and meaningful implications:

- educationally: it enhances how we teach collaboration and innovation on universities;
- economically: it boosts profitability;
- on public policy: as it enables responsiveness of public services and citizen-centered governance; and
- socially: regular team reflection (retrospectives) and psychological safety behaviors improve the quality of life through safer, more empowering work environments with increased job satisfaction and a healthier work–life balance (Bastiaansen and Wilderom, 2022; Edmondson, 1999; Rigby *et al.*, 2018).

The guidance of the EAT model can be used to develop high agile team effectiveness. Because agile team members mentioned that they rarely discuss interpersonal dynamics, discussing and reflecting on team aspects which can be facilitated by an agile coach. This practice can help to enhance a team's dynamics and adjust executive board members, leaders, agile teams and agile coaches' behaviors accordingly by strategizing, retrospective and applying EAT team dynamics (Beck *et al.*, 2001).

Organizations need teams, knowing that the collective is often stronger than the individual worker and that all teams are not created equal, so it is important to consider team dynamics (Salas *et al.*, 2018). So, agile teams should come to own the EAT predictors to gain awareness on the variety of different effective team behaviors to subsequently become effective functioning. The distilled EAT model servers as a practical framework to offer different perspectives to agile teams on how they "score" on the various ABC effectiveness predictors and Design enablers. The EAT model therefore can thereby use as a tool for learning, to observe and reflect the ongoing processes. Also, the EAT model can successfully be applied by agile coaches and consultants for offering action-learning type of interventions in retrospective type of meetings, ideally to be held quarterly. We experienced that the predictors naturally brought up discussions, which were perceived as valuable to make further team improvements: they helped teams to align on their practices, including their so far unspoken challenges and concerns. Teams which face difficult interpersonal collaboration in agile teams also can use the EAT model to gain insights and into their team problems and complexities, to discuss solutions and to gain commitment to improve sustainable collaboration. These interventions will help agile teams to continuously adapt their behaviors, to improve their agile ways of working. During those interventions, coaches and consultants need to support team members to understand the content of the dynamics, as this is not their daily language (Ferrario and Winter, 2023).

6. Limitations and future research

All participating teams were based in one Dutch organization. Although the teams differed in size, tasks and average years of work experience, the teams were embedded in a scaled agile framework (Schwaber and Sutherland, 2020). Also, the size of the organization impacts the adoption of agile: "nimble organizations" find that "agile is powerful," whereas "medium-sized and large companies, however, are less satisfied with what agile can do for them" (VersionOne, 2024, p. 3). Thus, future team research could consider inter-team dynamics of agile teams in networks. Also, because agile teams are increasingly asked to do more complex work, with tight interdependencies in delivering the work and working in different

hybrid team formats. Moreover, future research on team dynamics in this complex field of innovative technologies (from Artificial Intelligence and quantum to robotics and climate tech) needs to take a longitudinal approach. Especially on the team dynamics that are influenced by inter-team dynamics, such as inter-team orientation, collaboration (specific: collective responsiveness), trust, andcoordination. Artificial Intelligence has a high potential to positively impact agile team effectiveness, for example through enhanced decision making, more efficient sprint planning, better collaboration, communication and team learning. Thus, longitudinal studies are advised to understand how Artificial Intelligence redefines agile team dynamics, including the roles of the agile coach and product owner.

Second, even though the current study asked each respondent to reflect on their experiences in advance of the interview, more direct ways of observing behavioral team dynamics are recommended, especially to be combined with (objective) team performance. Also, longitudinal (case study) research of the EAT predictors could bring additional insights on how the predictors can support the development of highly performing agile teams. Such studies could also offer more insights on how other forms of leadership in agile, self-managing teams, beyond shared leadership, play out over time. It is advised to further examine the highest ranked predictors, over time, including their impact on actual team performance, as well as the plausible team mediators and moderators.

Third, the focus of our study was at the team level of analysis. Hence, we did not examine individual, functional or role-type of factors which may also affect team outcomes.

Fourth, two of the lower performing teams in our study addressed the role unclarity of their directive PO and the non-agile way of working by, for example distributing the tasks among individual team members. Also, the role of more senior Scrum Master was noted during some other interviews, as they were more likely than juniors to encourage their teams to discuss sensitive topics such as a (latent) team conflict. Hence, it might be beneficial not to have directive PO's in the room during group interviews as teams might want to openly reflect on their roles.

Finally, we did not focus on the impact of the agile team's relationships with clients and customers, and neither did it appear in our qualitative coding, as the PO was intended to take this role. This needs more research as having customers on the work floor and monitoring external relationships may influence (agile) team dynamics; it may, for instance, increase team situation awareness (Burke *et al.*, 2006). Also, a better shared (model) understanding and closed-loop communication will ensure that the team can faster adapt to the direct customer feedback which bring less need for contract negotiations and managing conflicts (Beck *et al.*, 2001).

7. Conclusion

This study empirically explores the EAT model that was based on a recent systematic literature review. The participating agile experts and teams further refined the model which can guide, in turn, new empirical studies on improving the performance of agile teams. Agile coaches, team members and leaders can use the enriched model during their retrospective sprint evaluations to improve their team dynamics, as so often agile teams do not live up fully to their Agile or own Manifesto promise, and the team-effectiveness literature has shown how vulnerable the delivery of high performing team output can be. Because many prior agile-team studies are built on classical team-effectiveness theories, these might not be fully applicable to the modern agile team environment. Thus, agile team research should build on refined models, such as the one presented herein, to conduct future longitudinal, intervention type studies that will not only increase our knowledge of the importance of various sets of EAT predictors but also boost agile team effectiveness on the go.

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