

Design for policy in data for policy practices.

Exploring potential convergences for policy innovation.

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Abstract

This position paper recognises and investigates a gap between two fields of research and practice dealing with innovation in public policy: *data for policy* and *design for policy*. While both these fields practise in the context of government and public sector, they do so with a different focus. On the one hand, *data for policy* focuses on the use of new digital data sources (e.g., non-traditional data, as citizens-generated data) and new organisational practices connected to digital data exploitation (e.g., data collaboratives). On the other hand, *design for policy* inquiries the adoption of design approaches, methods and tools in policy-making and public services development. These different focuses originated the current gap existing between the two fields, implying different approaches toward policy innovation.

This paper aims to advance an argument in favour of explicitly and systematically connecting them. To do so, I propose three areas of convergences by looking at experiences in the *data for policy* field. In these areas, I look at the value of this integration through the lens of policy innovation, intended as innovative ways of learning about policy-related matters that can influence the design of policies. The perspective offered is directed to scholars and practitioners in both fields and hopes to sparkle a fruitful discussion on innovative policy epistemologies, needed to address current complex policy problems. In the paper, I first contextualize my line of reasoning by reviewing the concept of public sector innovation (PSI). Then I consider different disciplinary perspectives on one particular PSI's subset: policy innovation. Starting from these, I propose to see policy innovation as innovative ways of learning about policy-related matters that can influence the design of policies.

Holding this perspective, I will hypothesize three potential areas of convergence between *data for policy* and *design for policy*. To support them, I will draw on illustrative examples found through a systematic review of articles

published in the past editions of the *Data for Policy* Conference.

Keywords – design for policy, policy design, policy epistemology, experimental policymaking

Introduction

Many public servants, policy scholars and government pundits may roll their eyes when hearing someone talking — once again — about innovation in the public sector. As fashionable as unclear, the concept of innovation risks to be considered just a fad by those who every day realistically confront with the rigidity of the public sector's structures. But ambiguity is not always harmful. As noted by Jenson (2015), the policy discourse is plenty of *quasi-concepts* (e.g., social cohesion, social innovation). A certain degree of indefiniteness grants these concepts the capacity of gathering diverse policy actors to face timely issues, enabling previously unseen positive practices and experimentations across various contexts. Whether or not we consider it a quasi-concept, the idea of innovation in government and public sector (often referred to as *public sector innovation* or *public innovation*) seems to have fuelled new practices and shaped new fields.

It seems to be the case for the two fields considered in this article: *data for policy* and *design for policy*. While having different focuses and approaches, they both systematically analyse and experiment new policy practices (e.g., enabled by new processes or new technologies). These activities are meant to collect new knowledge and nurture innovation in governments. When we look at them, the two fields appear far in many senses, but room for cross-fertilisation can be seen by looking at practical experimentations. Therefore, this article asks the following question: it is possible to imagine newly emerging areas of convergence between *data for policy* and *design for policy*? To answer,

one should first define innovation in a way that can adapt to both.

1 The framework of public sector innovation

Several events¹ in the last years testify the political interest increasingly surrounding Public Sector Innovation (from now on PSI). In 2013, the European Commission appointed the publication of a milestone report² dedicated to PSI to an international group of experts. In the same year, the OECD Public Governance Committee established the Observatory of Public Sector Innovation (OPSI), to foster and advocate PSI among the OECD's member states (OECD, 2015). OPSI's efforts throughout the years led to many advancements in political awareness and culture of PSI. For example, an international agreement (OECD, 2019) was recently signed by forty national governments on the pivotal role of PSI and the general principles for its support. This commitment to PSI configures as an emerging global movement of policy-makers and public servants (Bason, 2010, pp. 4–5).

PSI's conceptual roots are ancient: some authors date them back to Alexis de Tocqueville and Max Weber (Kattel et al., 2018). PSI recently gained popularity while not being a clearly defined concept (Pollitt, 2011). There are three main arguments usually indicated by literature on PSI to explain this interest. First, the economic importance of the public sector. In fact, "*in high-income countries the public sector contributes to between 20% and 30% of GDP*" (Arundel et al., 2019, p. 789). Therefore, innovation could foster this wealthy portion of the national economy, whereas its lack might lead to stagnation and wastes. The need to ensure efficiency through the continuous rethink of governmental functions — in particular in times of financial crisis — is certainly not new (see Osborne & Gaebler, 1992; Roessner, 1977). In particular, the efficiency-focused paradigm of PSI was particularly strong during the 80s, when public administrators, influenced by the New Public Management (NPM) theories, emulated management and governance models (e.g., decentralisation) from the private sector (Hartley, 2005; Thenint, 2010). A second argument that motivates interest in PSI is the accepted idea that we live in the time of *wicked problems* (Rittel & Webber, 1973). The term describes the inherent complexity of societal challenges, while at the same time outlining the limits of government's traditional problem-solving approach. Hence, PSI is considered an essential element to enable governments'

adaption to the highly complex challenges of our times (Ansell & Torfing, 2014; Bason, 2010; Kattel et al., 2014). Lastly, a third key argument regards the changing relationship between citizens and governments, in close connection with the critical role public services plays in our societies. Unlike innovation in the private sector, that traditionally focused on product development and new technology adoption (Borins, 2001; Lorena et al., 2012), PSI "*is usually not a physical artefact [...] but a change in the relationships between service providers and their users.*" (Hartley, 2005, p. 27). Citizens should be no longer considered as customers but rather co-producers of public services (Hartley, 2005). This perspective gained ground as the tertiary sector boomed during the last years, and new theories of value — notably the Service-Dominant logic (Lusch & Vargo, 2006) — emphasised the service suppliers/users interaction as the hub of value creation. In the public sphere, the pivotal role of citizens' inputs in supporting public infrastructures and services was already outlined by Elinor Ostrom (1996).

For all these reasons, PSI is motivated by the need to rethink governance structures. The co-creation/co-production paradigm would then become, for PSI, a characterising element, a driver and a desirable goal at the same time (Bason, 2010; Bekkers & Tummers, 2018; Selloni, 2017). The need to address citizens' needs and expectations motivates PSI (Mulgan & Albury, 2003, p. 2). Given these points, one can better contextualise the current definition of PSI: the ideation and implementation of "*new ideas that create value for society*" (Bason, 2010, p. 4). The concept of public value (Moore, 1995) maintains that public managers should bring value to society, as private managers bring value to their companies (Moore, 1995, p. 28). This compelling concept can synergise the work of many governmental actors striving for the same goals, e.g., public managers and policy designer (Mintrom & Luetjens, 2017). Although, defining value in the private sector is relatively easy (e.g., revenue), whilst how to identify and measure public value — and consequently PSI — is still object of debate (Bloch & Bugge, 2013; De Vries et al., 2016; Kattel et al., 2018; Pollitt, 2011). Therefore, it should not surprise that recent strands of PSI studies have focused on what makes it different from private sector innovation (Lember et al., 2018). Perhaps as part of distancing, scholars outlined several subcategories of PSI (see Hartley, 2005; Windrum, 2008) (e.g., governance innovation, conceptual innovation, service innovation). These subsets are sides of innovation traditionally neglected in innovation studies (Windrum, 2008), among which we find *policy innovation*.

¹ For a more exhaustive list of worldwide governmental initiatives for PSI support see Bason (2010).

² See EC (2013).

2 Policy innovation as innovative ways of learning

In the literature dealing with PSI, one can find different definitions of policy innovation. For example: "*new policy directions and initiatives*" (Mulgan & Albury, 2003, p. 4), "*a specific kind of innovation that involves the formulation, implementation and diffusion of new visions of what a good society is, concrete goals inspired by these visions, and strategies for moving society in the desired direction*" (Agger & Sørensen, 2014, p. 189) or "*the change of values and knowledge in a policy network*" (Windrum, 2008, p. 10). Windrum further elaborates how policy innovation happens by connecting it to different types of learning among policy actors, each leading to different outcomes. For example, to learn about the effectiveness of policy instruments would lead to an incremental innovation of these same instruments. Instead, when actors reconsider their shared understanding of policy problems and how to address them, this conceptual learning might result in more radical forms of conceptual innovation. Finally, when policy actors critically rethink their current social interactions and roles, they go through a social learning that might lead to innovating governance structures. By linking policy innovation and learning, Windrum draws on earlier studies of scholars in political and policy sciences (Sabatier, 1987). Although, he also recognises that this disciplinary field "*fails to address innovation*" by only considering "policy change" and "reform" (Windrum, 2008, p. 3). Political science and policy studies regard "*policy innovation*" not as the invention of original policies, but as the first adoption of policies and programs — that might be implemented elsewhere — in a context where they didn't exist before (Berry & Berry, 1990; Mintrom, 1997). "*Policy change*", as adjustments and changes in policies during the time, is considered a type of incremental innovation (Bennett & Howlett, 1992). These studies traditionally investigated causes and agents of policy innovation and change, deeming *policy learning* "*the updating of beliefs based on lived or witnessed experiences, analysis or social interaction*" (Dunlop & Radaelli, 2012, p. 599) as an essential driver of both. While the literature considered suggests that policy learning is a significant factor in policy innovation/change, a causal connection between them is never presented as obvious (Bennett & Howlett, 1992). For example, despite learning taking place in a policy network, innovation at the level of core beliefs (what Windrum would call "*conceptual innovation*") might be provoked by factors which are totally exogenous³. Nonetheless, in the authors' opinion, the link between policy innovation and learning

offers an interesting vantage point for shifting the traditional focus from *policy innovation as new outputs* (i.e., newly adopted policies) toward *innovation as new processes for reaching these outputs* (Vaz & Prendeville, 2019). In other words, to see policy innovation as *the application of innovative means* through which policy actors learn about policy problems. This learning might ultimately affect how these actors conceptualize policy issues, values and goals and, in turn, how policies are designed.

3 Data for policy and design for policy: where do they stand?

The perspective on policy innovation here proposed is certainly debatable. As the dedicated literature in policy studies warns us, learning is just one of the elements that might cause innovation and change in policy (Berry & Berry, 2018). For example, new policies are often the results of imitating what worked in other contexts, and they might not relate to design. Nonetheless, policy learning — acknowledged as a multi-layered phenomenon made of micro-, meso- and macro-levels (Dunlop & Radaelli, 2017) — seems to function well with the notion of policy innovation as a process (Vaz & Prendeville, 2019). Learning dynamics can explain innovation dynamics or, in other words, why adopting new solutions on, say, micro-level influence the macro-level. In this sense, this perspective might be valuable when looking at the *data for policy* and *design for policy* purposes and when it comes to imagine their potential integration. The point then would not be, for example, the use of data analytics or design thinking in policy settings in themselves. Rather, the inquiry would focus on what type of learning they entail, how this learning impacts across the various levels and whether it is innovative or not. We could ask, if the novel approaches and technologies in these fields enable innovative policy design spaces (Chindarkar et al., 2017). This is the perspective through which I will propose the areas of convergence between *data for policy* and *design for policy*. Before doing so, I will briefly present both.

3.1 Data for policy

Data for policy looks at the intersection between digital data and policy-making. Hence the community in this field is interested in several topics: the potential of leveraging non-traditional data sources (e.g., Internet data); new organizational settings and collaborations designed to integrate existing data (e.g., data collaboratives); new data

³ This is, for example, Sabatier's perspective (1987) on policy-oriented learning.

techniques and technologies to enhance organizational capabilities (e.g., network analysis, Machine Learning); issues related to data quality, privacy and epistemology when data are used in public decision-making. In terms of learning, using new data seems to offer an unprecedented potential to analyse patterns of behaviours within large scale systems, for example, cities (Bettencourt, 2014). Digital data — whether integrated among various public departments, coming from the private sector or collected from non-traditional sources (e.g., citizen-generated) — are expected to enhance the analytical capacity of policy-makers, allowing analysis of large scale issues in real-time (Hemerly, 2013; Maciejewski, 2017; Mureddu et al., 2012) and even to forecast the near future (Athey, 2017). While there is general agreement that data will increasingly impact policy-making (Giest, 2017), little empirical evidence exists connecting data and policy (Poel et al., 2018; Verhulst et al., 2019). Scholars in this field point at many issues for this lack, in particular the technological readiness of governments.

3.2 *Design for policy*

The relation between design and policy originates in the orientation of design research and practice toward complex systems (Buchanan, 1992; Jones, 2015) and the social sphere (Hillgren et al., 2011; Markussen, 2017). *Design for policy* was concretely shaped through a growing number of cases where design approaches, methods and tools — in particular from service design — got adopted within governments (Bason & Schneider, 2014; Kimbell, 2015). This phenomenon mainly regarded public sector innovation labs, special groups or units entitled by governments with a variegated agenda for supporting PSI (Tönurist et al., 2017). *Design for policy* presents substantial differences from traditional policy design (Clarke & Craft, 2019; Mortati, 2019). Policy design is considered a specific type of policy formulation, in which new policy goals are defined on the base of available knowledge on the effects of policy tools (Howlett, 2019). It developed as a technocratic and mechanistic inquiry on the effectiveness of policy tools, their interaction in policy mixes and the political and government capacities that consent design to happen (Peters et al., 2018). Conversely, the *design for policy* approach focuses on heuristics, creativity and abduction logic to public problem solving (Considine, 2012). By adopting a human-centred approach (i.e., investigating the beneficiaries experience) to policies and public services development, it seeks to reduce the gap between design and implementation (Christiansen & Bunt, 2014;

Junginger, 2013). To do so, it inductively collects informational inputs from stakeholders, with the goal of ultimately incorporating them to the final design of policies and services (Hermus et al., 2020). This practically leads the design for policy approach to happens in various participatory settings, where stakeholders are engaged in prefiguration activities through visualizations and prototyping of existing systems and future solutions (e.g., services) (Bason, 2017; Kimbell, 2015; Kimbell & Bailey, 2017). Design for policy has been criticized for being naïve to political/governance structures, hardly scalable and uncritical in privileging only a networked policy style (Clarke & Craft, 2019; Howlett, 2020).

4 *Design for policy in data for policy practices: potential areas of convergence*

To develop and innovate how governments learn about policy issues, thus improving policy and public services design and implementation, stands as an innovative proposition both in *data for policy* and *design for policy*. Both fields seek to inquiry new approaches, methods and tools to understand public issues and orient governmental interventions. In the perspective of this paper, the main difference among them relies in their different epistemological approach when it comes to understand policy issues. While *design for policy* privileges observational and inductive investigation that gather knowledge by probing users' needs and expectations, the *data for policy* approach understands phenomena by “letting the data speak”, approaching them with no previously existent theory (Bettencourt, 2014; Kitchin, 2014). Despite this distance, examples of cross-fertilization between their paradigms exists in several experimentations. For example, the Policy Lab in UK Government Cabinet Office, a notable subject in *design for policy* landscape, used big data and “thick” data (from ethnographic research) to support a human-centred approach to policy-making (Siodmok, 2020). Relevant subjects devoted to data innovation, as United Nations Pulse Lab Jakarta, explicitly used service design methods and tools in their portfolio (Pulse Lab Jakarta, 2019). Although, a theoretical perspective that connects policy, design and data is still missing⁴ (Mortati, 2019). For example, the use of data was not reported in empirical research on the adoption of design in public management

⁴ An example of research on integrating design thinking and data science for public purposes has been developed by the Innovation Insight Hub of

University of the Arts London: <https://www.arts.ac.uk/research/research-centres/innovation-insights-hub/iib-research/data-studio>.

(Bason, 2017). Public sector innovation labs adopt designerly and human-centred methods, but seem mostly focused on ICT, digital governance and open data, rather than data science (see Tönurist et al., 2017; a different perspective can be found in Williamson, 2015). I address this gap as a doctoral student in design, by looking at the *data for policy* field. I have analysed the proceedings of the previous edition of "Data for Policy" Conference (2015, 2016, 2017, 2019) available on Zenodo. This body of literature arguably constitutes a relevant representative sample of the *data for policy* discourse, while it cannot hold as totally representative for this whole evolving field. The proceedings included 74 papers that I reviewed by assigning codes with the support of qualitative analysis software. I developed my coding in order to identify examples relatable to *design for policy*. As expected, reasonable ground for proposing convergences could only be found in few articles. These articles often explicitly addressed topics as participatory approaches in data governance, co-creation, citizens empowerment and data literacy. They encompassed theoretical discussion (e.g., on data sharing models) and/or cases study presentation. As just few elements eventually emerged from coding, I was not possible to recognize patterns. Regardless, the analysis outlined few punctual cases that could work as illustrative examples to support the areas of convergence proposed. These areas were articulated accordingly to the perspective on learning explained above.

4.1 Area of Convergence: Learning from Data-driven Anticipatory Governance

This area of convergence starts from the old idea that governments should develop policies by anticipating futures events (Osborne & Gaebler, 1992). Many governments use the systematic prefiguration of possible future scenarios as an approach to strategy-making and in order to adapt to unpredictable events. This activity is usually operationalized through foresight methods and techniques. By borrowing elements from the design discipline, a design approach to futures (namely designing futures) employs diegetic prototypes and visualization to build normative and contextual visions (e.g., possible future services and governance settings) in participatory settings (Wilkinson, 2017). Kimbell (2019) connects this to *design for policy*, offering several examples on how this approach can enable new spaces (which she called "*studios*") devoted to handling policy complexity and uncertainty and collectively analyse past data and existing evidence.

Studios enable people to make problems graspable and imaginable in the face of high levels of ambiguity,

complexity and uncertainty. They translate between local, digital and expert knowledge and data and bring into view their different grounding myths, discourses and framings. (Kimbell, 2019, p. 134)

In *data for policy*, on the most basic level, this approach can support the probing of publics' opinion during data technologies development. For example, Jacobs et al. (2019) used diegetic prototypes to understand public acceptance of IoT technologies deployment, consequently identifying governance, transparency and accountability issues. These are not only relevant for consultation, but defines pivotal questions affecting the design of these systems:

It is important to ask such questions at the start of the process and as data are being collected, and consider why data needs to be collected at all, rather than just collecting it because it is there with usefulness to be decided later. (Jacobs et al., 2019, p. 5)

Predicting futures is also one of the major promises of *data in policy*, as mathematical modelling applied to new data sources allows the simulation of systems' future behaviours (i.e., forecasting). Forecasting tools might be enriched by integrating existing quantitative data and by collecting, through stakeholders involvement, new qualitative data pertaining to specific contexts. Dutt et al. (2019) report insights of a scenario-based simulation platform called "*Simulogue*", experimented in the administrative region of Chennai, India. The platform integrates quantitative data (e.g., land-use) and qualitative data (e.g., interaction between stakeholders) to improve policy decision-making, enabling dialogue and reflection on futures strategies. Data-driven anticipatory governance can be a context in which the in-depth insights emerging from participated conversation on futures mixes with data-driven probabilistic predictions (see Maffei et al., 2020).

4.2 Area of Convergence: Learning from local/contextual knowledge

The inclusion of contextual/local knowledge is an essential trait of *design for policy*. Within policy-oriented data activities, this type of knowledge can be valuable in supporting a descriptive/diagnostic analysis of data. In other words, local/contextual knowledge is a way through which we can identify causal mechanisms underlying patterns emerging in data analysis. To give a concrete example, we can consider the promising field of big data-based Positive Deviance. The Positive Deviances approach seeks to individuate individual or communities performing particularly well with respect to peers, to replicate what

makes them successful and achieve policy goals. Big data analysis can help to identify outliers, but the reasons underlying their outstanding performances can be discovered only by engaging and observing these contexts closely (Sternin et al., 2019). On a more sophisticated level, the inclusion of local/contextual knowledge in *data for policy* can lead to reconsider and shape data ontologies (i.e., the ensemble of concepts and relationships that represent the domain of interest quantified through data). Similar experimentation in this sense is presented by Edwards et al. (2017), showcasing an exploratory format called *Data Walk*. The interdisciplinary team Ensemble developed this participatory method with the two-fold aim of collecting data on flooding while engaging communities in critically reflecting on what was worth measuring for addressing that issue. This approach was meant to foster the interplay between expert and lay knowledge, thus reconsidering existent data ontologies. This innovative method may affect the whole epistemology of data-driven policy design for complex issues:

The advantage of using semantic integration in the construction of a scenario library goes beyond the ability to interrogate data from different perspectives. It also allows for the incorporation of novel data, qualitative data and localized data with existing data sources to present richer, nuanced picture of places with the potential for more refined models of risk and uncertainty. (Edwards et al., 2017, p. 3)

4.2 Area of Convergence: Learning from Services Systems.

Digitalized services are a valuable source of data for policy design. Data might be collected through digital public-owned services, but also by accessing private-owned service systems which continuously collect data for ensuring their standards (e.g., multi-utility companies). It is unlikely that all data related to a complex policy-relevant phenomenon could be found within a unique service system. Instead, a holistic view on services currently deployed is necessary to include and integrate them in a unique informational base. Arguably, the optimal approach would be the integration of all possible informational sources, but a careful integration based on mapping the extent of the service journey of policy actors. In the words of Ubaldi et. Al (2019):

Data analytics enable a closer working relationship between policy design and service delivery activities with a

resulting shift from top-down implementation of public services to a user need led approach to design and delivery, based on an end to end understanding of a particular service journey, which can consequently increase its reach and effectiveness. (Ubaldi et al., 2019, p. 22)

The inquiry into service systems to gather and integrate data for policy design could become an innovative practice of policy learning. A perspective on service design and services end-users, which is central in the *design for policy* approach, will be needed to find the necessary service data to assess policy problems. Malomo and Sena (2017) offer an illustrative example in this sense, by describing the case of an integrated data model for Kent County Council Children's Service (UK). Information from the different county's services was integrated into a model that could give a new view of children's' behaviours from how they used these services. This new data (e.g., public libraries underutilization) can, on the one hand, led to service adjustments (e.g., closing libraries to cut expenses), but they can also be used for others purposes not connected to those services (e.g., addressing young people's lack of interest in reading). In brief, the mutual reinforcement of *design* and *data for policy* in learning from service systems could be two-fold: on the one hand, the *design for policy* approach provides exploratory methods and techniques to map services journey starting from their users, thus allowing the integration of those data sources which are relevant to understand a specific phenomenon (for example, as in the example above, young people behaviours). On the other hand, given that services are, in many policy domains, resultants of the implementation of policies, given that the *data for policy* perspective is considered before service design, service systems can become a valuable way to monitor and evaluate those policies.

Discussion

Although new digital data sources and analytics technologies seem to constitute a disruptive factor in policy-making, they may not be enough when the issues addressed are too complex. Specialized knowledge is essential, but disciplinary silos and closed epistemic communities might diminish our capacity of seeing what each innovative field misses. As both *data* and *design for policy* just started to affect traditional government/governance modalities, this phase might be

⁵ See, as an example, the initiative of “*Their Future Matters*” (New South Wales Government, Australia) which monitor itself through an integrated model of service and administrative data (Taylor Fry, 2019).

the right moment to ask if and how they should join, ultimately considering current public sector and policy innovation goals. The areas of convergences I proposed attempted to articulate an answer by conceiving policy innovation as *innovative processes* that contribute to policy-making. In particular, *data* and *design for policy* seem well suited to work together by enabling innovative ways of policy learning, which is a relevant factor in policy innovation. I employed illustrative examples found in the *data for policy* field to support these areas of convergence, but this first effort is not enough to develop a methodological model or framework. Hence, the conceptualization of this convergence should in future couple with more empirical evidence of how these practices concretely unfolds in public sector. Nevertheless, the argument presented it is hopefully worth-considering by those who seek to understand new policy epistemologies, especially in those policy domains characterized by complex policy goals (e.g., circular economy policies, social innovation policies).

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References

- Agger, A., & Sørensen, E. (2014). Designing collaborative policy innovation: Lessons from a Danish municipality. In C. Ansell, & J. Torfing. (Eds.). *Public Innovation Through Collaboration and Design*. Routledge. <https://doi.org/10.4324/9780203795958>
- Ansell, C., & Torfing, J. (Eds.). (2014). Public innovation through collaboration and design. Routledge. <https://doi.org/10.4324/9780203795958>
- Arundel, A., Bloch, C., & Ferguson, B. (2019). Advancing innovation in the public sector: Aligning innovation measurement with policy goals. *Research Policy*, 48(3), 789–798. <https://doi.org/10.1016/j.respol.2018.12.001>
- Athey, S. (2017). Beyond prediction: Using big data for policy problems. *Science*, 355(6324), 483–485. <https://doi.org/10.1126/science.aal4321>
- Bason, C. (2010). *Leading public sector innovation: Co-creating for a better society*. Policy Press. <https://doi.org/10.1332/policypress/9781847426345.001.0001>
- Bason, C. (2017). *Leading Public Design: How Managers Engage with Design to Transform Public Governance*. Copenhagen Business School [PhD]. PhD series, No. 21.
- Bason, C., & Schneider, A. (2014). Public Design in Global Perspective: Empirical Trends. In C. Bason (Ed.), *Design for Policy* (pp. 23–40). Gower Publishing.
- Bekkers, V., & Tummers, L. (2018). Innovation in the public sector: Towards an open and collaborative approach. *International Review of Administrative Sciences*, 84(2), 209–213. <https://doi.org/10.1177/0020852318761797>
- Bennett, C. J., & Howlett, M. (1992). The lessons of learning: Reconciling theories of policy learning and policy change. *Policy Sciences*, 25, 275–294. <https://doi.org/10.1007/BF00138786>
- Berry, F. S., & Berry, W. D. (1990). State Lottery Adoptions as Policy Innovations: An Event History Analysis. *American Political Science Review*, 84(2). <https://doi.org/10.2307/1963526>
- Berry, F. S., & Berry, W. D. (2018). Innovation and Diffusion Models in Policy Research. In C. M. Weible & P. A. Sabatier (Eds.), *Theories of the Policy Process*. <https://doi.org/10.4324/9780429494284-8>
- Bettencourt, L. M. A. (2014). The uses of big data in cities. *Big Data*, 2(1), 12–22. <https://doi.org/10.1089/big.2013.0042>
- Bloch, C., & Bugge, M. M. (2013). Public sector innovation - From theory to measurement. *Structural Change and Economic Dynamics*, 27, 133–145. <https://doi.org/10.1016/j.strueco.2013.06.008>
- Borins, S. (2001). Encouraging innovation in the public sector. *Journal of Intellectual Capital*, 2(3), 310–319. <https://doi.org/10.1108/14691930110400128>
- Buchanan, R. (1992). Wicked Problems in Design Thinking. *Design Issues*, 8(2), 5–21. <https://doi.org/10.2307/1511637>
- Chindarkar, N., Howlett, M., & Ramesh, M. (2017). Introduction to the Special Issue: “Conceptualizing Effective Social Policy Design: Design Spaces and Capacity Challenges.” *Public Administration and Development*, 37(1), 3–14. <https://doi.org/10.1002/pad.1789>
- Christiansen, J., & Bunt, L. (2014). Innovating Public Policy: Allowing for Social Complexity and Uncertainty in the Design of Public Outcomes. In C. Bason (Ed.), *Design for Policy* (pp. 41–56). Gower Publishing.

- Clarke, A., & Craft, J. (2019). The twin faces of public sector design. *Governance*, 32(1), 5–21. <https://doi.org/10.1111/gove.12342>
- Considine, M. (2012). Thinking Outside the Box? Applying Design Theory to Public Policy. *Politics and Policy*, 40(4), 704–724. <https://doi.org/10.1111/j.1747-1346.2012.00372.x>
- De Vries, H., Bekkers, V., & Tummers, L. (2016). Innovation in the public sector: A systematic review and future research agenda. *Public Administration*, 94(1), 146–166. <https://doi.org/10.1111/padm.12209>
- Dunlop, C. A., & Radaelli, C. M. (2012). Systematising Policy Learning: From Monolith to Dimensions. *Political Studies*, 61(3), 599–619. <https://doi.org/10.1111/j.1467-9248.2012.00982.x>
- Dunlop, C. A., & Radaelli, C. M. (2017). Learning in the bath-tub: The micro and macro dimensions of the causal relationship between learning and policy change. *Policy and Society*, 36(2), 304–319. <https://doi.org/10.1080/14494035.2017.1321232>
- Dutt, V., Sil, S., Krishna, H., & Palavalli, B. (2019). *Imagining Futures – A generative scenario-based methodology to improve planning and decision-support systems for policymakers*. Zenodo. <https://doi.org/10.5281/zenodo.3066348>
- Edwards, L., Mullagh, L., Towe, R., Nundloll, V., Dean, C., Dean, G., Simm, W., Samreen, F., Bassett, R., Blair, G. (2017, September 4). *Data-driven decisions for flood risk management*. Zenodo. <https://doi.org/10.5281/ZENODO.884180>
- European Commission. (2013). *Powering European Public Sector Innovation: Towards a New Architecture*. Report of the Expert Group on Public Sector Innovation. https://ec.europa.eu/research/innovation-union/pdf/psi_eg.pdf
- Giest, S. (2017). Big data for policymaking: fad or fasttrack? *Policy Sciences*, 50(3), 367–382. <https://doi.org/10.1007/s11077-017-9293-1>
- Hartley, J. (2005). Innovation in governance and public services: Past and present. *Public Money and Management*, 25(1), 27–34. <https://doi.org/10.1111/j.1467-9302.2005.00447.x>
- Hemerly, J. (2013). Public policy considerations for data-driven innovation. *Computer*, 46(6), 25–31. <https://doi.org/10.1109/MC.2013.186>
- Hermus, M., van Buuren, A., & Bekkers, V. (2020). Applying design in public administration: A literature review to explore the state of the art. *Policy and Politics*, 48(1), 21–48. <https://doi.org/10.1332/030557319X15579230420126>
- Hillgren, P. A., Seravalli, A., & Emilson, A. (2011). Prototyping and infrastructuring in design for social innovation. *CoDesign*, 7(3–4), 169–183. <https://doi.org/10.1080/15710882.2011.630474>
- Howlett, M. (2019). *Designing Public Policies. Principles and Instruments*. Routledge. <https://doi.org/10.4324/9781315232003>
- Howlett, M. (2020). Challenges in applying design thinking to public policy: Dealing with the varieties of policy formulation and their vicissitudes. *Policy and Politics*, 48(1), 49–65. <https://doi.org/10.1332/030557319X15613699681219>
- Jacobs, N., Edwards, P., Markovic, M., Cottrill, C. D., & Salt, K. (2019). *Public Sector Internet of Things Deployments: Value, Transparency, Risks and Challenges*. Zenodo. <https://doi.org/10.5281/zenodo.2713118>
- Jenson, J. (2015). Social Innovation: Redesigning the Welfare Diamond. In: Nicholls A., Simon J., Gabriel M. (eds) *New Frontiers in Social Innovation Research*. Palgrave Macmillan, London. https://doi.org/10.1057/9781137506801_5
- Jones, P. H. (2015). Systemic Design Principles for Complex Social Systems. In G. S. Metcalf (Ed.), *Social Systems and Design* (Translatio, Vol. 1, pp. 91–128). Springer. <https://doi.org/10.1007/978-4-431-54478-4>
- Junginger, S. (2013). Design and Innovation in the Public Sector: Matters of Design in Policy-Making and Policy Implementation. *Annual Review of Policy Design*, 1(1), 1–11. <http://ojs.unbc.ca/index.php/design/article/view/542>
- Kattel, R., Cepilovs, A., Drechsler, W., Kalvet, T., Lember, V., & Tonurist, P. (2014). Can we measure public sector innovation? A literature review. In *LIPSE Working papers* (Issue 2).
- Kattel, R., Cepilovs, A., Lember, V., & Tõnurist, P. (2018). Indicators for public sector innovations: Theoretical frameworks and practical applications. *Halduskultuur*, 19(1), 77–104. <https://doi.org/10.32994/ac.v19i1.208>
- Kimbell, Lucy (2015) Applying Design Approaches to Policy Making: Discovering Policy Lab. Discussion Paper. University of Brighton, Brighton.
- Kimbell, L. (2019). What If There Were More Policy Futures Studios? *Journal of Future Studies*, 23(4), 129–136. [https://doi.org/10.6531/JFS.201906_23\(4\).0014](https://doi.org/10.6531/JFS.201906_23(4).0014)
- Kimbell, L., & Bailey, J. (2017). Prototyping and the new spirit of policy-making. *CoDesign*, 13(3), 214–226. <https://doi.org/10.1080/15710882.2017.1355003>

- Kitchin, R. (2014). Big Data, new epistemologies and paradigm shifts. *Big Data and Society*, 1(1), 1–12. <https://doi.org/10.1177/2053951714528481>
- Lember, V., Kattel, R., & Tõnurist, P. (2018). Technological capacity in the public sector: the case of Estonia. *International Review of Administrative Sciences*, 84(2), 214–230. <https://doi.org/10.1177/0020852317735164>
- Lorena, R. L., Simmonds, P., & Roma, L. (2012). Trends and challenges in public sector innovation in Europe. December, 1–56. published by DG Enterprise, Brussels.
- Lusch, R. F., & Vargo, S. L. (2006). Service-dominant logic: Reactions, reflections and refinements. *Marketing Theory*, 6(3), 281–288. <https://doi.org/10.1177/1470593106066781>
- Maciejewski, M. 2017. To Do More, Better, Faster and More Cheaply: Using Big Data in Public Administration. *International Review of Administrative Sciences*, 83(1_suppl), 120–135. doi:10.1177/0020852316640058
- Maffei, S., Leoni, F., & Villari, B. (2020). Data-driven Anticipatory Governance. Emerging scenarios in data for policy practices. In L., Kimbell & L., Vesnic-Alujevic (Eds.) *The Future of Government: Exploring Futures through Design and Foresight* [Special issue]. *Policy Design and Practice*. <https://doi.org/10.1080/25741292.2020.1763896>
- Malomo, F., & Sena, V. (2017). Data Intelligence for Local Government? Assessing the Benefits and Barriers to Use of Big Data in the Public Sector. *Policy and Internet*, 9(1), 7–27. <https://doi.org/10.1002/poi3.141>
- Markussen, T. (2017). Disentangling ‘the social’ in social design’s engagement with the public realm. *CoDesign*, 13(3), 160–174. <https://doi.org/10.1080/15710882.2017.1355001>
- Mintrom, M. (1997). Policy Entrepreneurs and the Diffusion of Innovation. *American Journal of Political Science*. <https://doi.org/10.2307/2111674>
- Mintrom, M., & Luetjens, J. (2017). Creating Public Value: Tightening Connections Between Policy Design and Public Management. *Policy Studies Journal*, 45(1), 170–190. <https://doi.org/10.1111/psj.12116>
- Moore, M. H. (1995). *Creating public value: Strategic management in government*. Harvard university press.
- Mortati, M. (2019). The Nexus between Design and Policy: Strong, Weak, and Non-Design Spaces in Policy Formulation. *Design Journal*, 22(6), 775–792. <https://doi.org/10.1080/14606925.2019.1651599>
- Mulgan, G., & Albury, D. (2003). Innovation in the public sector. Strategy Unit, Cabinet Office, 1(1), 40.
- Mureddu, F., D. Osimo, G. Misuraca, and S. Armenia. 2012. A New Roadmap for Next-Generation Policy-Making. *ICEGOV '12: Proceedings of the 6th International Conference on Theory and Practice of Electronic Governance*, 62–66. doi:10.1145/2463728.2463743
- OECD. (2015). *The Innovation Imperative in the Public Sector: Setting an Agenda for Action*. <https://doi.org/10.1787/9789264236561-en>
- OECD. (2019). *Declaration on Public Sector Innovation*. OECD/LEGAL/0450. <https://oecd-opsi.org/wp-content/uploads/2018/11/OECD-Declaration-on-Public-Sector-Innovation-English.pdf>
- Osborne, D., and T. Gaebler. 1992. *Reinventing Government*. New York: Addison-Wesley.
- Ostrom, E. (1996). Crossing the great divide: Coproduction, synergy, and development. *World Development*. [https://doi.org/10.1016/0305-750X\(96\)00023-X](https://doi.org/10.1016/0305-750X(96)00023-X)
- Peters, B. G., Capano, G., Howlett, M., Mukherjee, I., Chou, M.-H., & Ravinet, P. (2018). *Designing for Policy Effectiveness*. Cambridge University Press. <https://doi.org/10.1017/9781108555081>
- Pulse Lab Jakarta. (2019, Nov). *Repositioning Pulse Lab Jakarta*. Medium. <https://medium.com/pulse-lab-jakarta/repositioning-pulse-lab-jakarta-ce66fca4d48f>
- Poel, M., Meyer, E. T., & Schroeder, R. (2018). Big Data for Policymaking: Great Expectations, but with Limited Progress? *Policy and Internet*, 10(3), 347–367. <https://doi.org/10.1002/poi3.176>
- Pollitt, C. (2011). Innovation in the Public Sector: An Introductory Overview. In B. Bekkers, V. Edelenbos & J. Steijn (Eds.), *Innovation in the Public Sector* (pp. 35–43). Palgrave Macmillan. <https://doi.org/10.4324/9780429047879-1>
- Rittel, H. W. J., & Webber, M. M. (1973). Dilemmas in a general theory of planning. *Policy Sciences*, 4, 155–169. <https://doi.org/10.1007/BF01405730>
- Roessner, J. D. (1977). Incentives to innovate in public and private organizations. *Administration & Society*, 9(3), 341–365. <https://doi.org/10.1177/009539977700900304>
- Sabatier, P. (1987). Knowledge, Policy-Oriented Learning, and Policy Change. *Knowledge*, 8(4), 649–692. <https://doi.org/10.1177/0164025987008004005>
- Selloni, D. (2017). New Forms of Welfare: Relational Welfare, Second Welfare, Co-production. In *CoDesign for Public-Interest Services* (pp. 27–36). Springer.

- Siodmok, A. (2020, Jan) *Lab Long Read: Human-centred policy? Blending 'big data' and 'thick data' in national policy*. Policy Lab. UK Government Cabinet Office. <https://openpolicy.blog.gov.uk/2020/01/17/lab-long-read-human-centred-policy-blending-big-data-and-thick-data-in-national-policy/>
- Sternin, M., Zanetti, C., & Thuesen, L. (2019, Jan). *How can Positive Deviance and Big Data be a set up for a Date?* Medium. <https://medium.com/@dppd/how-can-positive-deviance-and-big-data-be-a-set-up-for-a-date-cbb297267002>
- Taylor Fry. (2019). *Forecasting Future Outcomes. Stronger Communities Investment Unit — 2018 Insights Report*. New South Wales Government. https://www.theirfuturesmatter.nsw.gov.au/___data/assets/pdf_file/0003/673284/Forecasting-Future-Outcomes-Stronger-Communities-Investment-U
- Thenint, H. (2010). *Mini Study 10 Innovation in the public sector*. Global Review of Innovation Intelligence and Policy Studies, 1-51.
- Tõnurist, P., Kattel, R., & Lember, V. (2017). Innovation labs in the public sector: what they are and what they do? *Public Management Review*, 19(10), 1455–1479. <https://doi.org/10.1080/14719037.2017.1287939>
- Ubaldi, B., Van Ooijen, C., & Welby, B. (2019). *A data-driven public sector: Enabling the strategic use of data for productive, inclusive and trustworthy governance*. OECD Working Papers on Public Governance, 33, 1–59. <https://doi.org/10.1787/09ab162c-en>
- Vaz, F., & Prendeville, S. (2019). Design as an Agent for Public Policy Innovation. Conference Proceedings of the Academy for *Design Innovation Management*, 2(1). <https://doi.org/10.33114/adim.2019.06.231>
- Verhulst, S. G., Engin, Z., & Crowcroft, J. (2019). Data & Policy: A new venue to study and explore policy–data interaction. *Data & Policy*, 1, 1–5. <https://doi.org/10.1017/dap.2019.2>
- Wilkinson, A. 2017. Strategic Foresight Primer. European Political Strategy Centre. https://cor.europa.eu/Documents/Migrated/Events/EPS_C_strategic_foresight_primer.pdf
- Williamson, B. (2015). Governing methods: Policy innovation labs, design and data science in the digital governance of education. *Journal of Educational Administration and History*, 47(3), 251–271. <https://doi.org/10.1080/00220620.2015.1038693>
- Windrum, P. (2008). Innovation and entrepreneurship in public services. In *Innovation in Public Sector Services: Entrepreneurship, Creativity and Management* (pp. 3–20). <https://doi.org/10.4337/9781848441545.00009>