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SPECIAL ISSUE • Policy-making as designing: the added value of design thinking for public administration and public policy

article

Applying design science in public policy and administration research

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There is increasing debate about the role that public policy research can play in identifying solutions to complex policy challenges. Most studies focus on describing and explaining how governance systems operate. However, some scholars argue that because current institutions are often not up to the task, researchers need to rethink this 'bystander' approach and engage in experimentation and interventions that can help to change and improve governance systems. This paper contributes to this discourse by developing a design science framework that integrates retrospective research (scientific validation) and prospective research (creative design). It illustrates the merits and challenges of doing this through two case studies in the Netherlands and concludes that a design science framework provides a way of integrating traditional validation-oriented research with intervention-oriented design approaches. We argue that working at the interface between them will create new opportunities for these complementary modes of public policy research to achieve impact.

key words design science • public policy • public administration • collaborative governance • public involvement • what works • engaged scholarship • evidence-based policy

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Introduction

Governments around the world are struggling to find innovative solutions for complex problems. Key issues are sustainability, the quality of living in cities, and inequalities and tensions between groups of citizens. To address these challenges, new forms of governance are needed which serve to make and implement collectively binding decisions that take into account the interests of all those affected, including future generations. Institutions for public governance and policymaking are, in their present form, often not up to the task. As a result, democratic and administrative

bodies tend to respond to major problems and challenges using yesterday's tools (Shkliarevsky, 2016; OECD, 2017; Zhang and Feeney, 2018).

There is a growing debate about the role of academic researchers in governments' responses to these challenges. The vast majority of public policy and administration scholars focus on describing and explaining how existing governance systems operate, but the need to engage in experimentation, interventions and other efforts to actually change (the conditions of) these systems is increasingly emphasised. Several scholars have therefore been advocating a fundamental rethink of the 'bystander' character of much research in the area of political science and public governance (for example, Ricci, 1984; Gunnell, 2004; Ansell, 2011; Schram et al, 2013). Accordingly, public policy and administration (PPA) research would need to be driven by extant theories and methods as well as be framed around pressing public issues and dilemmas in the real world (Smith, 2002; Shapiro, 2005; Schram et al, 2013; Buick et al, 2016).

In this paper, we contribute to this discourse by developing a design approach for PPA that integrates retrospective research (validation) and prospective research (design). We thus not only build on 'conventional' approaches to studying governance (for an overview, see Levi-Faur, 2012) but also on design science. The notion of design science (DS) arises from Simon's (1969) seminal work, and has been gaining momentum in fields such as information systems (for example, March and Smith, 1995), organisation studies (for example, Romme, 2003), and public policy and administration (for example, Shangraw and Crow, 1989; Considine, 2012; Bason, 2016; Ansell et al, 2017; van Buuren et al, 2019). In the field of PPA, there is a long tradition of design that primarily draws upon the idea of an expert-driven rational policy design, often based on a top-down, linear image of the policy-making process (for example, Rivlin, 1973; Lindblom and Cohen, 1979; Peters and Pierre, 2006). This tradition builds upon retrospective research for its knowledge basis. A limitation of this approach, however, is that it often fails to incorporate insights from design science such as user engagement and creativity. Notably, PPA approaches to design science (for example, Shangraw and Crow, 1989; Bason, 2016) have acknowledged the key role of users and creativity, but also have limited attention for the need to build robust knowledge about governance based on retrospective research. In this paper, we intend to synthesise both discourses in a framework that includes validation-oriented science as well as creative design.

As such, our key premise is that DS research needs to build on both retrospective (validation-oriented) and prospective (design-oriented) methods, and that consistent frameworks for this type of research are underdeveloped; some recent work on the value of design experiments is a notable exception (Stoker and John, 2009; Bakker and Denters, 2012). Our argument expands the latter work on design experiments, by highlighting the key mechanisms in these interactions between design and validation, rather than only conceptualising it as a specific type of experiment.

The main contribution of this paper is to develop a consistent methodology at the interface of design and science, as a strong foundation for PPA scholars to respond to many societal stakeholders calling for more evidence-based policymaking (van Buuren et al, 2019). This contribution is important because the lack of an inclusive framework may inhibit the development and adoption of DS in the field of PPA. In this respect, Simon (1969) emphasised that science is primarily about studying current (or past) practices, whereas design is about creating future practices.

The fundamental difference between retrospective science and prospective design is what makes work at the science-design interface so complex and challenging (Bason, 2016; van Buuren et al, 2019).

The argument is organised as follows. First, we explore the need for a consistent methodological framework at the interface between design and science, and then present a DS framework. Subsequently, two examples serve to illustrate this framework and explore the opportunities and challenges arising from this type of work. Finally, we discuss the implications of our argument.

Towards an inclusive methodology for design and validation in PPA

Validation and design have become separate domains in PPA research. In line with the broader trend towards 'scientification' in the social sciences (Bond, 2007), the bulk of PPA research focuses on validation by studying current/past behaviours and cognitions in order to identify generalisable patterns and build theories of policy and administration (for example, Kenis and Provan, 2009; Levi-Faur, 2012; Sarto et al, 2016). As such, the field of PPA contains a large number of highly interesting theories (of all sorts) and research findings, but is far away from a coherent body of knowledge that informs and motivates practitioners to become more effective in addressing their real-life administrative and political challenges (Ricci, 1984; Al-Habil, 2011; Ansell, 2011; Gunnell, 2004; Schram et al, 2013).

By contrast, the design perspective is still a niche approach in PPA research. The key contribution of this emerging approach is that it acknowledges the need for a focus on users (for example, citizens) as well as creativity as a key requirement for developing innovative solutions. While design-oriented research has been receiving more attention lately, the design perspective used by PPA scholars almost exclusively focuses on the question how high-quality designs can be realised in particular contexts (for example, Shangraw and Crow, 1989; Hood, 1991; Behn, 1996; 1997; Barzelay and Thompson, 2010; Dorst, 2012; Bason, 2017). Recent work in this area has made important contributions to design methodology (Stoker and John, 2009), but largely fails to connect context-specific designs to the ambition of building theories.

Simon's (1969) seminal *The Sciences of the Artificial* provides the starting point for the development of an inclusive methodology for design in PPA. Simon (1969) identified two key properties of administrative and other artefacts: human intentionality and environmental contingency. For one, human intentionality pervades (the creation of) artefacts like budgeting systems or digital platforms for public participation. Moreover, the design, development and performance of these administrative artefacts are highly contingent on cultural, institutional and other environmental conditions. Thus, human intentionality and environmental contingency make an exclusively 'scientific' approach inadequate for studying this type of artefact and related phenomena (Simon, 1969). This implies that PPA research is primarily a 'science of the artificial', that is, a professional discipline at the interface of creative design and scientific validation (Simon, 1969; Shangraw and Crow, 1989; Hatchuel, 2001). Therefore, a methodology is needed that connects design and validation or, framed differently, prospective and retrospective approaches to research.

Such an inclusive methodology for designing and validating policy interventions needs to acknowledge the diverse character of the PPA discipline. A mere focus on

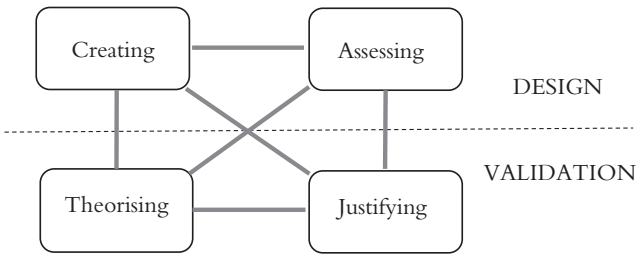
evidence-based policy (Davies and Nutley, 2000) does not suffice. The ambiguity around key notions such as theory and testing illustrates this diverse (if not to say fragmented) nature of PPA scholarship. Many scholars argue that *theory* involves propositions or statements that are generalisable as well as applicable to, or testable on, individual cases, that is, 'a way of imposing conceptual order on the empirical complexity of the phenomenal world' (Suddaby, 2014: 407). By contrast, others have been questioning this conception of theory (for example, Locke and Golden-Biddle, 1997; Flyvbjerg, 2001), because 'we cannot improve the theorizing process until we describe it more explicitly, operate it more self-consciously, and decouple it from validation more deliberately' (Weick, 1989: 1). As such, Weick (1989), Flyvbjerg (2001) and others have been advocating theory as an act of 'creative discovery'.

Similarly, the notion of *testing* is also highly ambiguous in the field of PPA. For many scholars, 'testing' (theory) refers to ways to assess the internal and external validity of constructs, test hypotheses by means of inferential statistics, and so forth (for example, Kenis and Provan, 2009; Citrin et al, 2014). For others, testing involves probing activities that serve to find out what kind of practices and interventions 'work', and which do not (for example, Smith, 2002; Stoker and John, 2009; Schram et al, 2013; Buick et al, 2016). Assessing the authenticity and complexity of specific practices and interventions is then given precedence over the goal of developing and testing general knowledge.

In any academic or professional field, it is rather difficult to make progress towards a coherent body of knowledge if key terms (such as theorising and testing) are highly ambiguous and disputed (Abbott, 1988). Therefore, we propose an inclusive taxonomy of key terminology regarding research activities and methods (compare March and Smith, 1995; Romme, 2016) which draws upon the distinction between design and validation. *Design* involves creating and assessing new PPA practices as well as developing new knowledge on these new practices or existing ones. Once (initial versions of) practices have been created, *validation* serves to theorise about them (for example, by codifying, generalising, modelling), and justify and (possibly) falsify the results of theorising activity.

Following March and Smith (1995), we can further differentiate this high-level categorisation into creating and assessing (together: design) and theorising and justifying (together: validation). Figure 1 provides an overview of the resulting framework. *Creating* involves the initial act of conceiving a PPA value, construct, model, principle or practice that is (perceived as) new. *Assessing* refers to the act of

Figure 1: The iterative and complementary nature of creating, assessing, theorising and justifying activity in PPA research



Source: adapted from Romme and Reymen, 2018

evaluating one or more of these research outputs against (value-based) criteria such as usefulness, fairness, viability and desirability – especially from the perspective of users (Bason, 2016). The acts of creation and assessment often go together, with many iterations back and forth. Moreover, creation and assessment have a specific meaning in the public sector since they are tightly connected to democratic and legal principles. In this respect, the focus on co-design does not only have an instrumental, but also a democratic value (Bason, 2016).

Validation work can be further disentangled in theorising and justifying activities. *Theorising* is about linking constructs in terms of models and principles that are generalisable as well as applicable to individual cases. *Justifying* involves any effort to enhance the legitimacy of a particular research output, by scrutinising it in terms of criteria such as generalisability, internal and external validity, and reliability.

Notably, the four research activities are highly complementary and tend to overlap substantially. For example, to be able to theorise by way of a (for example, conceptual, instrumental or mathematical) model, one first has to create or discover the relevant constructs regarding the PPA phenomenon at hand, and assess whether they are useful and desirable; and when scholars are building a model, they often return to design missing pieces (for example, constructs) of the emerging model. In other words, the various research activities feed on each other. The framework outlined in Figure 1 therefore merely serves to dissect the various steps, not to present them as independent stages of a research cycle.

We also concur with March and Smith (1995) by using the notion of 'justifying' rather than 'testing'. As argued earlier in this section, the notion of testing can be used in so many different ways and stages of the DS research cycle that it is rather meaningless as a generic label. Thus, the DS perspective suggests that PPA scholars need to specify a particular definition and interpretation of what constitutes a proper and meaningful 'test' in the context of one of the design and validation activities outlined in Figure 1. This test needs to be inclusive and therefore build on a pragmatist philosophy of science (Morgan, 2007). Interestingly, the 'justifying' notion is likely to raise the image of scholars being captured in the theoretical lens adopted (which is often the case). In the context of validating a particular theory, this 'capture' effect is indeed inevitable. In this respect, the DS perspective implies that the creative (theorising) process of comparing and possibly switching between theories is primarily fuelled by the creating and assessing (that is, design) activities.

Figure 1 provides an overview of the iterative nature of design and validation – as equivalent activities that together enable a viable and inclusive discourse on public administration and policy. It highlights the continuous interactions between the four types of research activity, both within and across the domains of design and validation. This figure also helps resolve some of the ambiguity around the notion of 'theory' arising from the tension between the conventional idea that theorising is a key element of validation and the idea that 'theorising' is key to creative design (Weick, 1989). As such, the iteration between the various activities is not a linear sequence, but rather a continuous interaction between them.

Overall, the inclusive DS perspective advocated here assumes that design and validation are highly complementary, which serves to embrace different traditions and notions of theory and testing (as previously outlined). This broad perspective is needed to realise the double objective of providing a rigorous theoretical understanding of

policy and administration *and* developing interventions for tackling major policy challenges and improving administrative practices.

Examples of research at design-science interface

We now turn to two examples that illustrate the iteration between the four research activities of the inclusive methodology. These examples are based on Ruijer et al (2018) and Romme et al (2018b). Full information about the research designs, data collection and data analysis is presented in these two publications. The first project involves a deliberate effort to redefine relations between citizens and government by introducing societal learning on the basis of open data. This project illustrates that a design approach is no guarantee for success but it is a robust method for systematically producing both theoretical knowledge and applied knowledge about the value of an innovative approach. The second example involves a project in which the political culture and policymaking processes of a municipality were transformed towards consent-based collaboration. In this case, the design approach produced both a successful innovation and new theoretical knowledge. The examples highlight that the inclusive methodology outlined in Figure 1 is no guarantee for successful governance innovation, but does present a systematic and robust method for developing and assessing innovative solutions and generating new theoretical knowledge by testing these innovative solutions.

Example 1: Informational resources for collaborative governance

Traditionally, governments develop public services and policies for citizens. In new arrangements advocated as New Public Governance (Osborne, 2006), citizens appropriate certain services and develop new solutions for public problems. These new governance arrangements raise a myriad of issues regarding the new roles of government and citizens. The study by Ruijer et al (2018) focused on one specific dimension of this changing relation: information processes. In this respect, government agencies use various kinds of data to develop policy plans and interventions. Data may contribute to the rationality of government and the adequacy of government planning, and good data are therefore seen as a crucial resource for government. Moreover, new internet technologies and a changing culture of openness have resulted in a push for open data. Open data is expected to strengthen the transparency of government, but also to facilitate collaborations between governments and societal actors. These collaborations, however, prove difficult to realise. We illustrate this by means of a practical intervention that aimed to develop a new form of societal learning between societal actors and governments on the basis of open data. This intervention was conducted in the Dutch provincial government of Groningen. Drawing on Ruijer et al (2018), the remainder of this subsection depicts the various activities in terms of the categories identified in Figure 1.

Creating

Like many rural provinces in Europe, Groningen faces major problems arising from the structural decline of its population, such as declining public facilities and limited economic opportunities. This province has long had the ambition to work with citizen groups to find innovative solutions to tackle these problems. As researchers,

Ruijer and coauthors introduced the idea of working with open government data to stimulate citizen initiatives aiming at improving the quality of life in Groningen. This intervention was part of a European project on open data for the public sector. Within the context of this European project, a tool for working with open data, based on the principle of user-centrality, had previously been designed. The key ambition of the project in Groningen was to use this tool for creating new forms of collaboration between government and societal actors on the basis of innovative usage of data about key issues. To identify key problems and relevant data from a user perspective, the research team initiated a series of creative workshops with citizens and governmental representatives.

Assessing

These workshops served to identify several key problems and relevant data sources. The problems were positioned within the broader issue of dealing with the declining population of Groningen, while citizen groups raised two specific issues: setting up a home for the elderly and stimulating the circular economy. These issues were directly related to the plans of citizen groups to improve their environment in response to the broader problem of population decline. The workshops helped to shape the collaboration between the province and various civic initiatives on the basis of open data. At the heart of the planned interventions was the idea that a provincial government can stimulate civil society by providing the data and a platform for collaboration. In the process, the researchers observed that the citizen groups have a clear perspective on the data they needed for their plans, but they did not have the skills and the time to work with the data.

Creating

To tackle this problem, 'slack capacity' was created in the form of students who could work in teams on assignments to answer the questions from citizens, using open data from government. This experimental structure for developing a learning collaboration resulted in interesting ideas and outcomes for the citizens involved.

Assessing and justifying

The first tryouts of student teams working on these assignments also led the researchers to assess a mismatch between the data offered by government and the data needed by citizens. The province acknowledged this problem, but lacked the administrative capacity or the will to solve it on the short term and thereby make the data available. Particular kinds of data were protected and not made available for use, and middle managers played a key role in limiting funds for generating access to data. This effectively meant that the value of this new platform for open societal learning was demonstrated, but institutionalising it further proved to be a step too far. In spite of the discourse on the need to change and adapt to the information age, stability was still embraced as a key value in this bureaucratic organisation. The organisation thus continued to largely focus on survival rather than adaptation to the new era. As a result, maintaining exclusive access to strategic information resources was seen as crucial to the survival of the provincial organisation, and therefore the call for openness was (not openly) ignored but effectively dismantled.

Theorising

The key proposition in this study was that a regional government can effectively stimulate civil society by providing open data and creating a platform for interpreting these data and collaborating with/between citizens. The evidence arising from the Groningen case suggests that a narrative about the coproduction of solutions with citizens needs to acknowledge the deep, institutionalised inertness of bureaucratic organisations.

Justifying

Subsequent explorations in other governmental settings highlighted the validity of the patterns found in the province of Groningen, but also suggest that dismantling the call for openness is not the only option. Depending on the position of the open data broker, s/he can act as an innovation entrepreneur to use 'information windows' – that is, types of information that are not seen as sensitive but still are useful for external stakeholders – to develop more collaborative approaches to information. These innovation entrepreneurs help to reposition the organisation in the changing environment, while still respecting its core values.

Theorising

On the basis of these theories and justifications, new approaches to designing informational resources for collaborative governance can be developed. These approaches build on a theoretical understanding of the role of stability but also innovation in the public sector, and do not assume that the open discourse is simply reproduced within the organisation. Building upon Kingdon (1995) and Cohen et al (1972), additional theoretical notions such as 'window of opportunity', 'garbage can' and 'innovation entrepreneur' were used to enrich the theoretical understanding of these processes of social change. These interventions depart from the idea that information resources are strategic and political; thus, in developing information resources for collaborative governance, one needs to identify 'information windows' and 'innovation entrepreneurs' in rather chaotic decision-making processes. A key issue here is timing: the ambition to realise a highly different mode of working for the province, within a timeframe of several months, proved not to be realistic. At the same time, this intervention provides crucial insights in the requirements for organisational change. As such, several key barriers in realising a vision of collaboration with citizens on the basis of open data have been identified, and alternative routes to realise these changes can now be developed. At the same time, this study helped to extend existing theory of the transition towards New Public Governance (Osborne, 2006). As such, there is a substantial gap between public administration practice and the dominant discourse about the impact of information technologies on access to information, and Ruijer et al (2018) developed key insights and notions to bridge this gap.

Example 2: From competition and collusion to consent-based policymaking

Any attempt to increase participation by citizens in public governance is rather complex and challenging, also as a result of the rather inert institutions of representative democracy. Democratic bodies such as city councils often appear to be unable to make high-quality decisions on public policy; moreover, many citizens appear to have lost trust in political institutions and their policy outcomes. In a study conducted

in the Dutch municipality of Utrechtse Heuvelrug, Romme et al (2018b) explored whether and how the 'informed consent' principle can be used to improve public policy development and decision-making. In 2012, the newly formed city of Utrechtse Heuvelrug (UH) was facing a high level of public distrust, resulting in a dysfunctional city council. UH had been created from a merger of five small villages, and one of the first decisions of UH's newly formed city council was to build a new city hall, which caused many citizens to protest against their local politicians: more than five thousand citizens signed a collective letter of protest. This distrust rose even further due to several other local incidents. As a result, one of the aldermen had to step down and public distrust grew to an all-time high. (In Dutch municipalities, the city council is the legislative body and the board of aldermen, chaired by the mayor, is its executive body.) UH's city council and mayor were thus facing enormous challenges arising from the need to restore trust as well as increase civil participation in policy decisions. The remainder of this subsection outlines the subsequent flow of activities in terms of the categories in Figure 1.

Creating

Early 2012, the mayor decided to call upon UH's citizens to investigate options for more effective local governance. All citizens were invited to volunteer to participate. A group of 15 citizens was thus formed, which named themselves the 'bridge builders'; this group included several co-authors of the (later) article by Romme et al (2018b).

Assessing

As a first step, the bridge builders (BB) group decided to set up a number of meetings to investigate the needs of all people involved: civil servants, councillors, citizens and aldermen. Via these meetings, the BB group found there was not just one gap to bridge, but a larger number of gaps, misunderstandings, perceptions and miscommunications between all stakeholders. The BB group also studied and discussed several reports as well as several best practices in other municipalities, to identify and create several key values for successful participation projects.

Creating

The BB group decided to embrace two key values: first, the equivalence and involvement of all stakeholders, including those with huge stakes and opposing views and opinions; and second, the search for creative solutions to which all participants can consent. Subsequently, the BB group initiated and conducted several workshops with civil servants, councillors and aldermen to jointly develop a new collaborative approach. The BB group used these workshops to introduce participants to the key construct of informed consent (for example, Buchanan and Tullock, 1962; Romme, 1999; Romme and Endenburg, 2006) and familiarise them with the various instrumental principles that guide groups in making policy decisions by informed consent. These sessions served to create a deeper understanding of policymaking by informed consent.

Assessing and creating

In April 2013, the BB group presented its report to the city council. The report included the following principles for strengthening the connection between citizens and the municipal administration: (a) the city council decides at an early stage about

the level of citizen participation that will be used for a specific policy issue; (b) the city council sets and defines the boundaries (for example, budget constraints, delivery time and other conditions) for any participation process; (c) a project group then gets the assignment to investigate the topic and decide by consent on a solution within the boundaries set by the city council; this project group is formed after an open call to all citizens; (d) when the project group delivers its solution, the city council only assesses if the solution proposed meets the boundaries defined earlier; if this is the case, the city council validates the solution; (e) if the project group cannot make a decision by informed consent within the given boundaries, the city council again has the authority to freely decide on the issue at hand. The city council discussed the recommendations of the BB group in a meeting that was also attended by one of the aldermen, representatives of civil servants, and several members of the BB group. The key outcome of this meeting was the decision, taken by informed consent of all participants, to launch a pilot project to obtain more practical experience.

Creating

Soon after this decision, the election of a new city council took place in March 2014, which resulted in eight parties being elected into the council. Interestingly, the eight leaders of these political parties elected into the council decided by consent on the new policy programme, including an agreement on major budget cuts.

Theorising and justifying

Evidently, this approach is fundamentally different than the common practice of forming majority coalitions. Its main theoretical background involves theories of policymaking by 'informed consent', as opposed to consensus or majority vote (Buchanan and Tullock, 1962; Romme and Endenburg, 2006). The following key hypothesis thus appeared to be justified in the UH setting: a local democracy can effectively make public policy by informed consent, and thereby transcend the common practice of majority voting and coalition formation. The first major 'test' of this hypothesis involved the aftermath of the election in 2014, when all political parties elected in the council decided by consent on the policy intentions for the next four years.

Creating and assessing

Inspired by these experiences, the new city council also formed a new taskforce to develop a new approach towards local democracy and governance, informed by their initial experiences as well as the BB's recommendations. Towards the end of 2014, this taskforce delivered a report to the city council, which decided to adopt all of its recommendations. A key decision was to set up so-called 'Thursday evening' meetings in which city councillors meet citizens to explore ideas as well as form opinions on a particular policy issue. These open meetings would enable the city council to more effectively take decisions (by consent) on issues previously explored and discussed in one or more 'Thursday evening' sessions. The city council expected this approach would provide more access to the expertise and ideas of citizens, and reinforce the council's role as orchestrator of civil participation and local democracy.

Theorising and justifying

These new policymaking practices have been fully implemented as of February 2015, and the initial results are very promising. More broadly speaking, UH's political processes appear to be transforming from a practice characterised by collusion and competition, to one characterised by collaboration. The UH example suggests that any effort to close the perceived gap between voters/citizens, elected representatives, aldermen and civil servants best starts at the root of the problem: the need to respect the needs and interests of every individual citizen. In this respect, the principle of informed consent reflects the fundamental values of equivalence and mutual respect, and thus appears to provide an important alternative to decision rules such as consensus and majority vote. This alternative has long been neglected by political scientists (compare Buchanan and Tullock, 1962), although the informed consent principle has made inroads in various specific policy areas (for example, in European privacy law and in providing healthcare services). The prevailing praxis of democracy draws on majority rule and thereby promotes the formation of coalitions and majority–minority ploys, which in turn tend to undermine the natural preference for consent-based collaboration. By contrast, the approach developed in UH appears to enable participation by all those citizens who want to directly contribute, while the city council maintains its role as orchestrator of civil participation and also retains the final authority to make policy decisions. This approach goes beyond the vast majority of civic participation practices, such as community building and neighbourhood support, which do not directly contribute to policymaking processes (for example, Smith, 2009; Zhang and Feeney, 2018).

Theorising

At a more general level, the UH example suggests that efforts to renew public governance are more likely to succeed if they exploit the strong desire of many citizens to engage in various forms of 'expressive' behaviour (Copeland and Laband, 2002) other than merely voting in an election every four years. Notably, many citizens may especially want to actively voice their concerns regarding topics and issues they are highly interested in, rather than a broad range of issues. Here, the key challenge for the theory and practice of democratic governance is how the reservoir of political interest and expertise, which is rather unevenly distributed across citizens and policy issues, can be used to support and inform policymaking in an effective but fair manner (Romme et al, 2018b).

Discussion and conclusion

The inclusive methodology for design in PPA advocated in this paper embraces validation-oriented research as well as the creative design of new practices and their underlying constructs and models. Most research in PPA takes the existing institutional context as a fact of life, and thus, few scholars deliberately adopt a creative design- and intervention-oriented approach (for example, Smith, 2002; Gunnell, 2006; Ansell et al, 2017) that would make scholarship much more impactful and relevant to its societal stakeholders. In this paper, we synthesised both discourses in a framework that includes scientific validation as well as creative design, as two complementary modes of research which tend to iteratively interact over time.

Overall, the DS perspective enables PPA scholars to explicitly embrace a broad array of possible research outputs of design and validation work. This inclusive approach towards research activities and outputs serves to acknowledge different traditions and notions of theory and testing (as previously outlined). Moreover, it explicitly acknowledges that not only constructs and models, but for example also practices and their underlying values can be exposed to scientific validation in PPA. This broad perspective arises from the dual objective of providing a rigorous theoretical understanding of policy and administration *and* developing interventions for tackling current social problems and improving administrative practices.

Notably, the DS methodology appears to go beyond action research and other applied research strategies. In this respect, DS systematically connects creative design (including intervention) with scientific validation through a variety of mainstream and non-mainstream methods, whereas for example action researchers tend to focus exclusively on qualitative data collection and analysis (Eden and Huxham, 1996; Romme, 2003). DS therefore includes constructs and models as research outputs but also embraces values (for example, transparency and civic participation in first example), design principles (for example, for making policy decisions by consent in second example) and practices (for example, open data platform in example 1 and 'Thursday evening meetings' in example 2) as key resources and outputs of scholarly work in PPA. Most importantly, action research tends to emphasise retrospective problem diagnosis more than prospectively exploring and creating solutions (Romme, 2003).

The two examples in the previous section illustrate the recursive and iterative nature of research at the design-science interface, going back and forth between creating, assessing, theorising and justifying activities. They also illustrate the need for contextualising and adapting interventions to local settings and re-adjusting theoretical concepts and models. These projects demonstrate how societal interventions are – or are not – realised through policy interventions, but also suggest that new theoretical understandings of collaborative forms of governance can be developed by focusing specifically on information processing and the relation with democratic institutions. The two design research projects highlight the need to understand collaborative governance in its relation to existing routines and institutions, such as the elections in the second example, and thus provide also a basis for more nuanced interventions. Therefore, the DS framework presented in this paper apparently serves to integrate design and validation activities, and conceptualises PPA research as an iterative combination of these activities rather than separate research traditions.

The examples also point at other challenges arising from work at the design-validation interface. Both studies illustrate that practitioner–scholar partnerships enable so-called 'insider–outsider' research (compare Bartunek and Louis, 1996). Insider-outsider research has the overall quality of marginality, that is, one is neither altogether inside or altogether outside the system. In these partnerships, 'the outsider's assumptions, language, and cognitive frames are made explicit in the insider's questions and vice versa. The parties, in a colloquial sense, keep each other honest – or at least more conscious than a single party working alone may easily achieve' (Bartunek and Louis, 1996: 62). An important requirement for this quality of marginality to arise is a shift in the power dynamics between scholars and practitioners, that is, the research design needs to involve the human agents in those systems as active participants in the research process, rather than merely as passive subjects and respondents. This

shift towards equivalence of practitioners and scholars also serves to balance design and validation, given that practitioners have an interest in designing new tools and policies (compare practices), while scholars' primary focus tends to be on validating the underlying constructs, models and principles. Here, one specific challenge is the democratic mandate of the research team to introduce new values into the system. To prevent capture or randomness, a systematic reflection on the origins of these values and the power positions in the field is crucial in this type of research.

This exploratory paper did not yet explicitly address the scope of application of the inclusive methodology proposed. In this respect, the DS framework is more likely to be applied in smaller jurisdictions than larger ones (for example, at national or supranational levels), due to two factors. First, smaller jurisdictions have a less complex stakeholder system, and second, the policymaking and implementation processes are more tightly coupled. These conditions may promote DS projects at local levels, while not completely inhibiting similar interventions at governmental levels beyond local ones. Examples of design-driven projects at the national and global levels are New Zealand's radical tax reform (Stephens, 1993), the active engagement of thousands of citizens in writing new legislation in Taiwan (Barry, 2016; Tang, 2016), and the creative design of an alternative global governance system (Romme et al, 2018a). The challenges arising from DS projects in large jurisdictions compared to smaller ones are, however, not yet well understood and require more research.

The type of work enabled by the inclusive framework proposed here may be highly challenging (see also, Stoker and John, 2009; Bakker and Denters, 2012). In this respect, the first example shows that the initial energy and commitment arising from a deliberate intervention does not easily result in organisational changes and outcomes embraced by practitioners. The second example, though, suggests that public institutions can be deliberately transformed, especially when key agents and stakeholders share a sense of urgency regarding the dysfunctionality of existing arrangements and engage in a collective effort sustained over several years. The institutional work expected from researchers in these co-creation processes demand skills and competences that are radically different from what researchers in our field usually learn.

Notably, we are not arguing that all research needs to be design-oriented or adopt the methodological framework presented earlier. In this respect, social science-driven research into established or emerging PPA settings is entirely legitimate, because it provides a deeper awareness and understanding of these settings (see Figure 1). The point is that PPA, as a field, can only grow if (at least a substantial number of) scholars rise to the challenge of making a difference and deliberately engaging in attempts to co-create practices with citizens, administrators and politicians. If the science as well as design tradition are nurtured, many new opportunities for impactful work at the interface between the two will arise.

Of course, the question can be raised whether PPA scholars have the mindset, skills and incentives to engage in this type of research. In this respect, graduate programmes may have to be adapted to educate future generations of scholars in more inclusive methodologies such as design science. Moreover, journal editors, deans of public administration schools and other key stakeholders need to rethink some of their guidelines regarding research output and academic careers (Rousseau, 2012; Romme, 2016). One specific step for deans to consider is developing a so-called 'organisational

learning contract' that might be instrumental in redefining the expectations and commitments of the school's leadership, faculty and students (Rousseau, 2012).

In conclusion, a methodological framework for doing design science was developed in the first half of this paper. Subsequently, we reviewed several examples of studies at the design-science interface, and discussed the learnings and implications for future work in this area. The examples highlight that DS can prevent a flight into the academic ivory tower, but also avert an exclusive instrumentalisation of our discipline.

Conflict of interest

The authors declare that there is no conflict of interest.

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