Democratic Innovations and the Environment: Impacts of Public and Citizen Participation in Environmental Decision-Making

The Impacts of Democratic Innovations

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Chapter Nine

Democratic Innovations and the Environment: Impacts of Public and Citizen Participation in Environmental Decision-Making

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INTRODUCTION

Democratic innovations in the governance of climate change, sustainability and the environment currently receive widespread attention, as the recent citizen assemblies in Germany and France on these matters illustrate (Kübler, Kirby and Nanz 2020; Eymard 2020). Apart from these high-level initiatives, public participation and democratic innovations have proliferated environmental governance over the last decades, especially below the national level. These initiatives are tied to high hopes of setting new incentives for addressing the urgent sustainability challenges of our time while at the same time improving the state of our democracies (Geissel and Newton 2012; Smith 2009; van der Does and Jacquet 2021; *see also* Ryan, Chapter One in this volume) and to leading further favourable social and collaborative outcomes (Jacquet and van der Does 2021). Yet, empirical insights into potential benefits of public participation remain sparse. Often originating from a myriad of single, unrelated case studies, empirical research has mainly focused on more immediate social and collaborative outcomes, such as learning, trust-building or conflict resolution, leaving aside the effectiveness of decisions (Pogrebinschi and Ryan 2018), such as environmental repercussions, both positive or negative, here referred to as the environmental standard of a decision. Hence, in this chapter, I aim to shed light on the questions of if and how democratic innovations and public participation lead to environmentally favourable and socially acceptable outcomes, shedding light, in particular, on the mediating effect of social and collaborative outcomes.

To approach these questions, I rely on a unique dataset of 153 cases of citizen participation in environmental decision-making from democratic, western countries (Newig *et al.* 2021). This data was generated through a meta-analysis of published case studies (case survey method), in which qualitative case studies were transformed into numeric data by means of a coding process guided by a comprehensive, theoretically informed coding scheme (Newig *et al.* 2013). In this way, the case survey method combines the richness of case study research with the structured comparison of large-N comparative analysis (Larsson 1993). In the analysis, I use structural equation modelling (SEM) to examine the causal pathways through which different dimensions of participation impact environmental governance outputs and their social acceptance, mediated through intermediate social outcomes such as learning or trust-building.[1]

The findings of this chapter suggest that public participation may indeed enhance the environmental standard and social acceptance of governance outputs, albeit to varying degrees depending on the specific dimension of participation. This relationship is mediated through two broad clusters of interlinked social and collaborative outcomes, one around capacity-building and one around the convergence of perspectives of those involved. The analysis also provides some more nuanced insights as to the limits of participation.

HOW ARE DEMOCRATIC INNOVATIONS EXPECTED TO IMPROVE ENVIRONMENTAL DECISION-MAKING?

Democratic innovations are understood here as new institutions 'developed to reimagine and deepen the role of citizens in governance processes by increasing opportunities for participation, deliberation and influence' (Elstub and Escobar 2019: 11). Hence, the key point of departure is a public governance and decision-making process striving for a collectively binding decision on some environmental matter (Newig *et al.* 2018).

The overall hypothesis of this chapter is that democratic innovations and public participation have a positive impact on the environmental standard of governance decisions and on their social acceptance. In the literature on environmental governance, public participation is often brought forward to effectively solve complex sustainability problems (Heinelt 2002; Carr, Blöschl and Loucks 2012); to raise acceptance of governance decisions (Birnbaum 2016); and to smooth their path to implementation (Bulkeley and Mol 2003).

Newig and colleagues (2018; 2019), in a comprehensive review, compiled various pathways through which public participation may prove beneficial for the environment. Disentangling public participation in its different procedural dimensions and identifying a number of intermediate social and collaborative effects, they distil five clusters of mechanisms through which public participation may have positive environmental impacts. Public participation may prove beneficial as it opens up decision-making processes to environmental advocacy; through delivering new environmentally relevant knowledge; through providing venues for deliberation to realise mutual benefit and common good; through resolving conflicts; and through fostering capacity and willingness for implementation and compliance. However, if and when public participation has a positive effect on the environment is disputed and research gaps remain as to how and through what mechanisms such a positive impact would unfold (Gerlak, Heikkila and Lubell 2013).

To approach this question and explore different pathways through which participation may have an impact on environmental governance decisions and their acceptance, I will rely on an input–output model of democratic innovations (Gastil *et al.* 2017). Within this model, the characteristics of democratic innovations and public participation serve as independent variables, which are hypothesised to produce several intermediate social outcomes and eventually influence environmental outcomes. Figure 9.1 summarises this conceptual model.
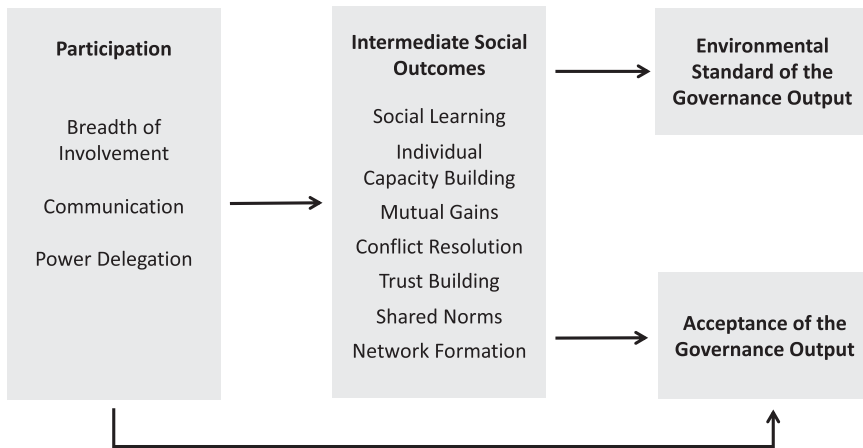

Figure 9.1. Conceptual Model linking participation to outcomes

Source: adapted from Jager *et al.* 2020.

As the definition of democratic innovations already suggests, three dimensions of participation help characterise and map the inputs or characteristics of participatory processes (Fung 2006; Newig *et al.* 2018):

1. *Breadth of involvement*: who participates in the process (e.g., invitation of few selected experts or citizens, or open for the general public)?
2. *Information and communication flow*: how do participants exchange information and communicate, (e.g., one-way information provision *versus* deliberative communication)?
3. *Power delegation to participants*: to what extent can participants influence the substance of decisions?

These three dimensions serve as the input, or independent variable, for our analysis, as they are assumed to have varying effects on the social and environmental outcomes of governance processes. When designing participatory processes, decision-makers are able to emphasise these three dimensions to different extents, by choosing the particular process format, such as different techniques and approaches of democratic innovations, through which citizens and stakeholders may be able to participate, deliberate and co-decide.

With regards to the output, I differentiate between the governance output itself, the acceptance of this governance output, and several intermediate social outcomes. *Governance output* typically comprises a collectively binding decision, programme or plan that constitutes the end product of a (participatory) decision-making process. In the case of environmental governance, this governance output can have a higher or lower environmental standard, depending on the provisions and measures included. These differ regarding their various consequences for the environment, ranging from tolerating severe environmental degradation to pushing for wide-ranging environmental improvements.

Acceptance of the governance output is a central function of public participation, as it forms an important link between the content of a decision and its implementation (Birnbaum 2016; Newig *et al.* 2018). Democratic innovations may enhance acceptance in multiple ways: (i) through participation and direct representation, stakeholders may experience greater ownership of the decision, especially if it reflects their interests (Brody 2003); (ii) but even if the output deviates from their own interests, participants may also accept the decision if the process is deemed fair and trustworthy (Webler and Tuler 2000; Wondolleck and Yaffee 2000).

Intermediate social and collaborative outcomes serve as causal links through which democratic innovations and public participation are assumed to foster their acceptance and increase the standard of governance outputs.

Based on the literature, I identified the following: social learning and individual capacity-building; identification of mutual gains for participants and conflict resolution; trust-building and development of shared norms; and network-formation.

Learning processes can take place individually and collectively (Gerlak and Heikkila 2011). On both the individual and the collective levels, deliberative processes, dialogue and knowledge-sharing are fundamental for enabling learning processes (Newig *et al.* 2019). *Individual capacity-building* refers to a process where individuals are exposed to new knowledge and acquire new skills and competences for specific problem-solving (Beierle and Cayford 2002), for decision-making process participation, or for becoming 'better citizens' more generally (Michels 2011). *Social learning* involves a collective dissemination process, during which knowledge becomes situated within a wider group of participants (Gerlak and Heikkila 2011). Through the exchange of knowledge and perspectives, a group can arrive at a shared understanding that may prove instrumental for a better diagnosis of the problem at hand, for finding appropriate solutions, and for creating joint purpose and collective action (Emerson and Nabatchi 2015; Muro and Jeffrey 2012). Both individual and collective learning processes may increase the effectiveness of decision-making processes by giving access to new knowledge and generating innovative ideas that benefit the environmental standard of the output. Where learning further extends to the social and institutional environment and includes matters of social consensus and feasibility, learning may also contribute to the acceptance of governance outputs.

Where strong interests and conflicting positions are involved, deliberative venues may provide a space and the means for the identification of *mutual gains* and the *resolution of conflicts* (Delli Carpini, Cook and Jacobs 2004). A transparent exchange of issue-specific and underlying interests and positions through intensive dialogue may spur an improved mutual understanding of actors' stakes and preferences and the identification of common ground among participants (Ansell and Gash 2007; Emerson and Nabatchi 2015). These recognitions may provide a common basis for breaking stalemates, help identify win–win potential, and/or more broadly facilitate more constructive and collaborative interactions towards widely acceptable solutions (Dukes 2004). Resulting governance outcomes may then cater to the interests of all or many of the affected parties, including the environment, which is likely to have a positive effect on the outcome's environmental effectiveness and acceptance (Brody 2003; Susskind, McKearnan and Thomas-Larmer 1999).

Whereas learning and win–win solutions may directly impact the environmental standard of governance outputs, *trust-building* and the *development*

of shared norms are less direct consequences of public participation (Jacquet and van der Does 2021) and provide a foundation more generally underpinning successful environmental governance (Bryson, Crosby and Stone 2006; Getha-Taylor *et al.* 2019). Trust may be generated through repeated and reciprocated interactions and communication. Once accumulated, it can generate mutual commitment and confidence in partners' competence, facilitating further collaboration (Chen and Graddy 2010). Such sustained interaction and shared experiences among actors, on a more fundamental level, can then serve as basis for the development of shared values conducive to collaboration and reciprocity (Thomson and Perry 2006). Trust and shared norms accumulated in this way may be conducive to establishing a shared sense of purpose and are favourable conditions for effective environmental problem-solving (Heikkila and Gerlak 2013), with positive consequences for the environmental effectiveness and acceptance of governance decisions (Webler and Tuler 2000).

Finally, from a structural perspective, repeated interactions and communication through participatory processes may foster the formation of more durable relationships in the form of governance *networks* (Klijn and Koppenjan 2016). Such networks allow actors to share knowledge and information and to realise common interests, for example, in turn providing the structural means for realising some of the previously discussed intermediate outcomes, such as social learning (Newig, Günther and Pahl-Wostl 2010), conflict resolution (Klijn, Steijn and Edelenbos 2010), and trust-building (Schneider *et al.* 2003). Hence, networks may foster the mobilisation and exchange of resources between dispersed actors and ultimately collective action and joint problem-solving (Innes and Booher 2004).

Although described separately, I do not assume these intermediate outcomes work in isolation. Rather, they can be seen as forming a web of interlinkages (*cf.* Newig *et al.* 2018). The empirical inquiry addresses these interrelations and patterns of co-occurrence and assesses them in the analysis, in order to explore how, together, they constitute pathways through which the different dimensions of participation impact on the environmental standard and social acceptance of governance outputs.

DATA AND METHODS: DIGGING THROUGH THE SCAPE DATABASE ON PARTICIPATORY AND NON-PARTICIPATORY ENVIRONMENTAL DECISION-MAKING

To approach the research question, I rely on the SCAPE database on participatory and non-participatory environmental decision-making (Newig *et al.*

2021), which was compiled using a meta-analysis of qualitative case studies (case-survey method) (Larsson 1993; Yin and Heald 1975). The transformation of qualitative information from narrative case study texts into quantitative data was the core of this method, and provides a numeric interpretation of the rich case material. This standardisation makes this method particularly suitable for synthesising emergent findings in a field dominated by dispersed, single small-N case studies, such as the field of democratic innovations. Within this database, a 'case' is defined as a 'public environmental decision-making process oriented towards reaching a collectively binding decision. A case can be to a lesser or greater extent participatory, ranging from classical political-administrative decision-making to highly inclusive instances of collaborative co-governing.' (Jager *et al.* 2020: 387). Departing from this definition, the database was built in three consecutive steps (for a more detailed description, *see* Jager *et al.* 2020; 2021):

1. *Case study identification and selection*: cases in the database were identified through a comprehensive search of several scientific databases and catalogues. The search included published as well as grey literature and focused geographically on Europe, North America, Australia and New Zealand. The systematic search and selection process is displayed in detail in Figure 9.2. Main criteria for inclusion in the database were that cases actually describe a case of public (as opposed to, for example, private) environmental governance, and that it contained sufficient information on all aspects of the case (context, process, outcomes).

2. *Coding scheme development*: a comprehensive coding scheme was developed for the transformation of qualitative case narratives into quantitative data (Newig *et al.* 2013). It contains more than 250 variables that together map the 'degree' of participation, together with a detailed assessment of governance outputs, their acceptance, and further social and collaborative outcomes, as well as main contextual factors, thus providing the basis for this analysis. Most variables were coded on a five-point quantitative scale (from 0 to 4, indicating the degree to which the variable reaches a theoretical maximum to be expected under realistic optimal conditions). Additionally, each variable is assigned an extra code measuring the reliability of the case information upon which each variable coding decision was based (from 0 = no information/no variable code to 3 = explicit, detailed and reliable information). This additional information gives an indication of the reliability of the underlying case information.

3. *Case coding*: On the basis of the coding scheme, each case was coded independently by three different coders to allow for divergent interpretations of the case and to increase the reliability of the data. After initial

coding, the three coders met to discuss discrepancies between their codes, aiming to address technical errors and to explore various interpretations but not necessarily to reach consensus. The different codes were, in a last step, aggregated by averaging across the three coders' interpretations. Intercoder reliability – measured through the estimator $G(q,k)$ (Putka *et al.* 2008) – and intercoder agreement – measured through r_{WG} (James, Demaree and Wolf 1984) – for the data used in this analysis are both at 0.8, indicating an overall reliable data quality.

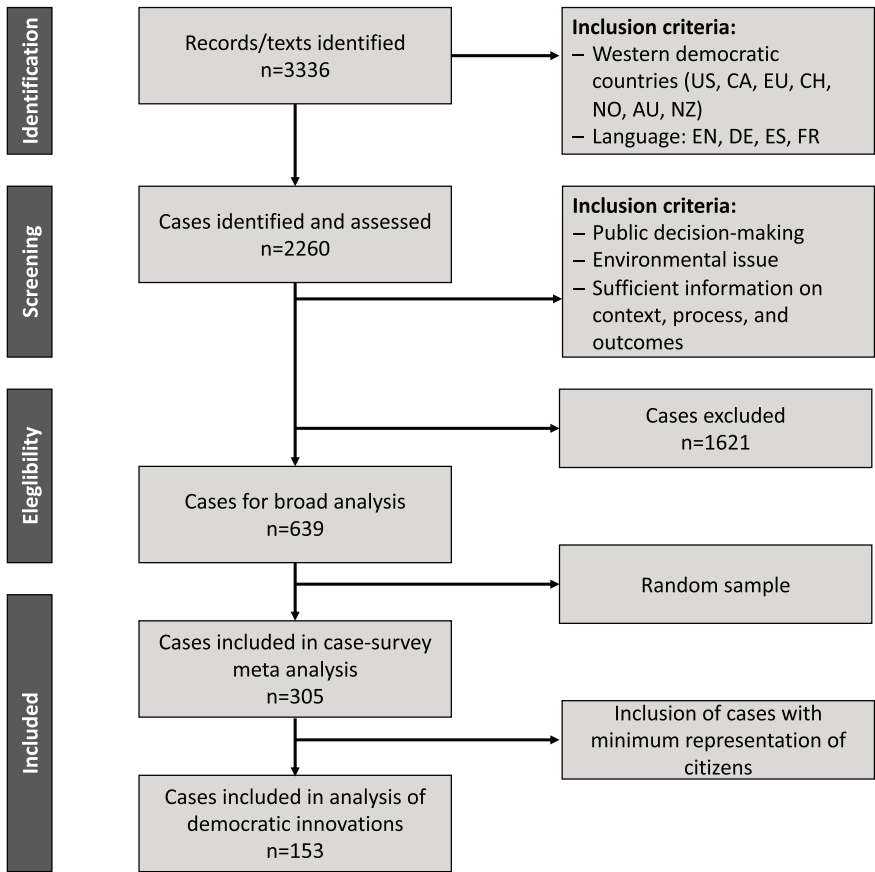| Identification	Records/texts identified n=3336	**Inclusion criteria:** – Western democratic countries (US, CA, EU, CH, NO, AU, NZ) – Language: EN, DE, ES, FR
Screening	Cases identified and assessed n=2260	**Inclusion criteria:** – Public decision-making – Environmental issue – Sufficient information on context, process, and outcomes
Elegibility	Cases for broad analysis n=639	Cases excluded n=1621
		Random sample
Included	Cases included in case-survey meta analysis n=305	Inclusion of cases with minimum representation of citizens
	Cases included in analysis of democratic innovations n=153	

Figure 9.2. PRISMA flowchart of case identification and selection

Source: (Moher *et al.* 2009).

Country codes: AU=Australia, CA= Canada, CH=Switzerland, EU=European Union member states (incl. United Kingdom), NO=Norway, NZ=New Zealand, US=United States.

Language codes: DE=German, EN=English, ES=Spanish, FR=French
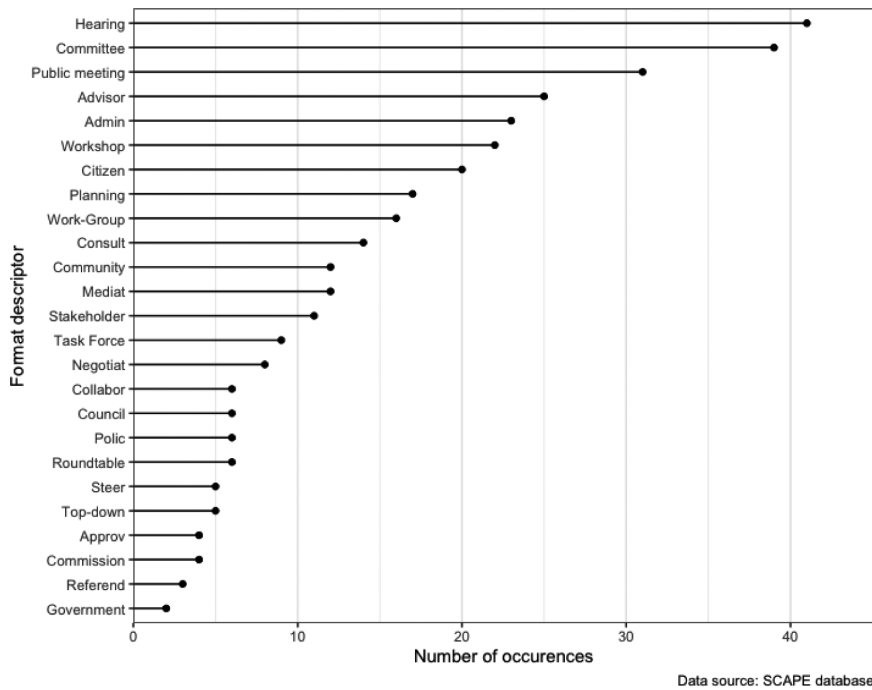
Figure 9.3. Self-description of participatory process formats within case database

Note: Terms on the left depict search terms employed to browse process formats as stated by case authors, e.g. 'Consult' to account for 'Consultation meeting' or 'Consultative group', etc. Up to three process types per case allowed.

Although this dataset was designed to assess the role of public participation and collaboration in environmental governance more broadly, without a specific focus on democratic innovations, it may provide a unique opportunity to assess the environmental and social consequences of these governance formats. To concentrate on processes that correspond to the characteristics of democratic innovations outlined above, I only include in this analysis those 153 cases in which citizens had the opportunity for some form of direct involvement and representation in the decision-making process,[2] as opposed to those processes that include civil society merely through organised interests. A quick appraisal of the self-descriptions of these formats (Figure 9.3) reveals that hearings, committees and public meetings are the most frequently employed process types.

Variable specification

In line with the definition of democratic innovations stated above, I map the main procedural characteristics of democratic innovations along three

dimensions: participation; deliberation; and influence (Elstub and Escobar 2019), which serve as independent variables in this analysis. Detailed definitions of all variables and select descriptive statistics are provided in Table 9.1.

Participation and the *involvement* of non-state actors is approached through the representation of citizens and civil society actors in each given case. In detail, this variable elicits the extent to which the field of participants mirrors the interest constellation in the full public. It is measured on a scale from 0 to 4, where 0 indicates that a stakeholder group is not represented at all, while 4 means that a stakeholder group is well represented in terms of number and acceptance of representatives (Newig *et al.* 2013). Values between 0 and 4 in turn indicate partial and imperfect representation. *Deliberation* measures the degree

> … to which deliberation in the sense of a 'rational' discourse among participants took place. [This] refers to a process of interaction, exchange and mutual learning preceding any group decision. During this process, participants disclose their respective (relevant) values and preferences, avoiding hidden agendas and strategic game playing. Agreements are based on rational arguments, and principles such as laws of formal logic and analytical reasoning (Newig *et al.* 2013: 44; *cf.* Fung 2006; Renn 2004).

This variable was measured on a 0 to 4 scale, with 0 meaning no such communication took place and 4 indicating that the decision-making process was characterised by continuing deliberation among participants. Finally, *influence* is understood as the 'degree to which the participants … actually developed and determined the output' (Newig *et al.* 2013: 44), that is, the extent to which participants had a say in the shape and content of the decision. The variable is measured on a 5-point scale calibrated as above, with 0 indicating participants did not have direct influence and 4 meaning participants fully determined the output.

The main dependent variables are the environmental standard of governance output, as well as its acceptance. Governance output refers to the end product of a decision-making process, for example, in the form of a management plan, a permit, a law and so on. In 144 of 153 cases, decision-making produced an output, and in the remaining nine it did not.

To allow for comparison across a variety of cases, the concept of 'regime effectiveness' conceptualised by Underdal (2002) is applied to governance outcomes. In this approach, regime effectiveness is measured against the yardstick of a hypothetical collective optimum, 'one that accomplishes … all that can be accomplished – given the state of knowledge at the time'

(Underdal 2002: 8). Hence, the environmental standard of the governance output is defined as the 'degree to which the environmental output aimed at an improvement (or tolerated a deterioration) of environmental conditions …. This is to be assessed moving from the "business as usual" scenario (projected trend) towards a hypothetical "optimal" (or "worst case") condition.' (Newig *et al.* 2013: 49). To assess the output in this way, coders first determined the business-as-usual scenario, that is, a scenario reflecting what would be likely to happen assuming no change in current trends and practices. If the governance output would imply a continuation of this scenario, this would result in a variable value of 0. Changes induced by the governance output are then measured on a scale from -4 to 4. Extreme values of -4 and 4 imply that the governance output corresponds either to a 'worst-case' scenario or to a hypothetical optimum, respectively. The actual variable value for each case then indicates to what extent the governance decision aims to deviate from the business-as-usual scenario and aspires to reach a collective optimum (or worst-case).

At the same time, the environmental standard is assessed from two perspectives: a rather eco-centric *conservation* perspective, and a more anthropocentric perspective of *natural resource protection*. While the conservation perspective aims 'to preserve, protect or restore the natural environment and ecosystems … largely independently of their instrumental value to humankind' (mean=0.82), the natural resource protection perspective aspires 'to protect, preserve, enhance or restore stocks and flows of natural resources that are of instrumental value to humans, and provide for their sustainable use' (mean=1.00) (Newig *et al.* 2013: 10). As both perspectives are highly correlated (r=0.90, p<.001), an index for the *Environmental Standard of the Output* was constructed from their means (alpha =. 95). Finally, *acceptance* assesses whether those affected by the environmental problem and the final decision accepted the governance output (*see* Table 9.1). This variable represents the average acceptance judged across all stakeholder groups identified within the case.

Descriptions and details of the intermediate outcomes are summarised in Table 9.1.

Table 9.1. Description of intermediate social outcome variables

Variable name	Description	Scale	Mean (SD)
Participation			
Involvement	Extent to which the composition of participants in the process mirrors the interest constellation in the public. Full representation is reached when there are a sufficient number of representatives and when those representatives are fully accepted as such by their constituencies.	0..4	1.49 (0.49)
Deliberation	Degree to which deliberation in the sense of a 'rational' discourse among participants took place. The notion of deliberation refers to a process of interaction, exchange and mutual learning preceding any group decision. During this process, participants disclose their respective (relevant) values and preferences, avoiding hidden agendas and strategic game playing. Agreements are based on rational arguments, and principles such as laws of formal logic and analytical reasoning.	0..4	1.87 (0.96)
Influence	Degree to which the participants […] actually developed and determined the output.	0..4	2.30 (1.00)
Intermediate social outcomes			
Social Learning	Social Learning Degree to which participants, stakeholders, or broader society learned about the issue such that they gained new or improved understanding or knowledge of the issue, enabling them potentially to contribute to future joint problem-solving efforts ('social learning' in the sense of Reed et al. (2010).	0..4	2.03 (0.72)
Individual Capacity-building	Degree to which the skills and capabilities of individual participants or stakeholders were enhanced through involvement in or engagement with the decision-making process. These skills and capabilities may be specific to the issue at hand, or incidental and applicable to a range of social situations.	0..4	1.74 (0.77)
Trust-building	Degree to which trust relationships were created or strengthened among participants (and potentially beyond), which can be expected to "facilitate coordination and cooperation for mutual benefit" (Putnam 1995: 67, see also Ansell and Gash 2007). "Trust is the willingness to accept vulnerability based on positive expectations about another's intentions or behaviors" (McEvily, Perrone, and Zaheer 2003).	-4..4	0.84 (1.29)

Variable name	Description	Scale	Mean (SD)
Network Formation	Degree to which social networks were created or built up (or undermined) among participants and beyond [...]. Networks are defined here in the sense of social capital building, which can be expected to "facilitate coordination and cooperation for mutual benefit" (Putnam 1995: 67) regarding capacity to address the problem or similar issues	-4..4	1.22 (0.94)
Building Shared Norms	Degree to which social capital among participants (and potentially beyond) was created or strengthened in the sense of "informal values or norms shared among members of a group that permit cooperation among them."	-4..4	0.75 (0.78)
Conflict Resolution	Degree to which an existing conflict was resolved or worsened or a new conflict developed, considering also the nature of change in any pre-existing conflict of values and/or distribution.	-4..4	0.91 (1.30)
Mutual Gains	Degree to which win-win solutions were developed during the decision-making process (i.e. degree to which the output provided mutual gains). Win-win (or Pareto optimal) solutions are those that provide gains (or at least: no losses) to all involved parties. These are always positive-sum solutions compared to the non-collaborative alternative. Win-win solutions include solutions where compensation is provided to those who would otherwise suffer losses. Win-win solutions are not necessarily limited to the environmental issue at hand, but may be linked to alternative issues and competing interests on and off the table, as well as to future decisions (Wondolleck and Yaffee 2000: 50).	0..4	1.57 (0.94)
Outcomes			
Environmental standard of the output	Degree to which the environmental output aimed at an improvement (or tolerated a deterioration) of environmental conditions [...]. This is to be assessed moving from the 'business as usual' scenario (projected trend) towards a hypothetical 'optimal' (or 'worst case') condition.	-4..4	0.91 (1.26)
Acceptance	Did stakeholders oppose, accept or support the decision? This variable is an average over all stakeholders identified in the case.	0..2	1.58 (0.40)

Note: Definitions are derived from Newig *et al.* 2013. The right-hand column displays the arithmetic mean over all cases, with standard deviations (SD) in parentheses.

Data analysis

To address the research question of how democratic innovations and public participation contribute to the environmental performance of governance, and how intermediate outcomes mediate this relationship, I rely on exploratory factor analysis and structural equation modelling.

A correlation analysis of the seven intermediate outcomes supports the earlier assumption that those factors form a web of interlinkages (mean correlation = 0.53; max = 0.77). To capture the structure of this web and reduce the dimensionality of the data, I conduct an exploratory factor analysis. The scree plot of eigenvalues and a parallel analysis (Hayton, Allen and Scarpello 2004) suggest two factors to describe the data structure adequately. The resulting two latent variables, specified through oblique rotation, will be used in the further analysis.

The conceptual model underlying this analysis poses specific methodological challenges, as it assumes indirect and mediated relationships between variables. To account for this complexity, I use a structural equation modelling (SEM) approach that explicitly allows for accommodating and testing such relationships. More specifically, I rely on a piecewise SEM approach (Shipley 2009; Lefcheck 2016), which allows incorporation of a wide range of distributions and sampling designs, and smaller data sets, and further includes an exploratory component that helps to uncover misspecifications and overlooked paths. Therefore, this method enhances our theoretically informed path analysis with exploratory momentum to detect unexpected pathways and variable relations.

ANALYSES AND RESULTS

Interlinkages between intermediate outcomes

Through the exploratory factor analyses, I identified two distinct but correlated factors to adequately represent intermediate outcomes (*see* Table 9.2). I label the first factor *Convergence of perspectives* as it mainly includes those intermediate outcomes that express the ways in which actors' perspectives, positions and values converge or diverge during a participatory process (that is, Identification of Mutual Gains; Conflict Resolution; Trust-Building; and Building Shared Norms). The second factor comprises variables that assess the degree to which participants learn and build capacities and networks during the process (that is, Individual Capacity-Building; Social Learning; Network Formation), which is therefore termed *Capacity-building*. These two newly identified latent variables serve as intermediate variables in the model, mediating the effects that participation may have on governance outputs and their acceptance.

Table 9.2. Intermediate social outcomes – results of the exploratory factor analysis, oblique rotation (oblimin), factor loadings >.4 or <-.4 in bold.

Variable	Factor 1 'Convergence of Perspectives'	Factor 2 'Capacity Building'
Mutual Gains	**0.91**	-0.15
Conflict Resolution	**0.89**	-0.02
Trust-building	**0.67**	0.37
Building Shared Norms	**0.64**	0.32
Individual Capacity-building	-0.03	**0.90**
Social Learning	0.03	**0.83**
Network Formation	0.04	**0.77**
Eigenvalues	2.66	2.53
Per cent of variance	0.38	0.36
Reliability (Cronbach's alpha)	0.87	0.81

*Note*: results of the exploratory factor analysis, oblique rotation (oblimin), factor loadings >.4 or <-.4 in bold.

Main analysis: how do democratic innovations impact on environmental governance outputs?

On the basis of our conceptual model and the exploratory factor analysis, I ran a piecewise SEM. Given the exploratory phase of this modelling technique, additional relevant paths could be identified between power delegation and both dependent variables, as well as between involvement and the acceptance of the governance output.

Relevant indicators show that the final model (N=143) demonstrates a reasonable overall fit.[3] As the final results in Figure 9.4 show, the model has high explanatory power with R-square ranging for the various outcomes between. 30 and. 59.

The results show that involvement, deliberation, and influence have quite diverse effects on the intermediate and final outcomes, highlighting the added value of the chosen approach. Deliberation shows strong effects on both capacity-building (β=.45, p<.001) and convergence of perspectives (β=.27, p=.001). The involvement of citizens and civil society actors, however, has only a weak significant effect on capacity-building (β=.14, p=.04), while the influence of participants shows a strong positive effect on the convergence of perspectives (β=.52, p<.001).

Moving to the environmental standard of the output, only the convergence of perspectives displays a significant positive effect (β=.22, p=.04), but not
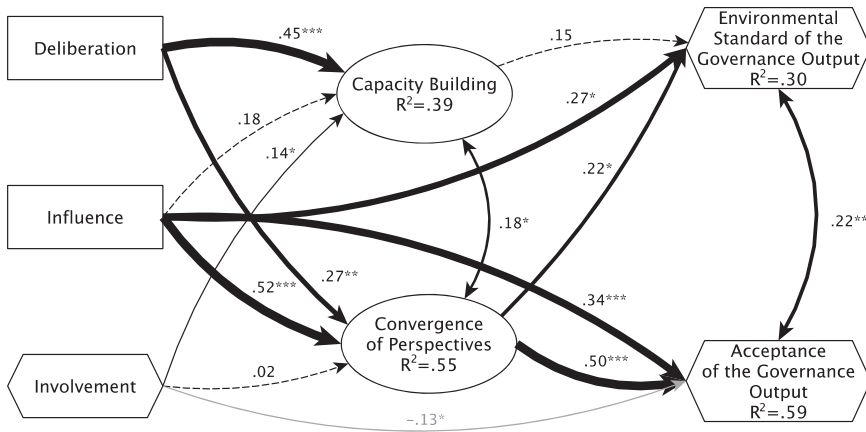
Figure 9.4. Structural equation model results

Note: Rectangles represent measured variables; ellipses are latent variables; and hexagons represent composite variables. Arrows depict (standardised) beta values; arrows are weighted by the size of beta values. Dashed lines represent insignificant effects; grey lines negative effects. Significance thresholds: *p < .05, **p < .01, ***p < .001.

the intermediate variable of capacity-building. However, an even higher effect can be detected for the unmediated effect of influence on the environmental standard of the output (β=.27, p=.01), indicating that there might be further ways, beyond the ones tested here, in which empowering citizens and stakeholders may benefit the environmental output.

Finally, acceptance is also strongly influenced by the convergence of perspectives (β=.50, p<.001), and also by the influence that participants have over the outputs (β=.34, p<.001). However, another unanticipated significant effect appears here: a small, but significantly negative effect of the involvement of citizens and civil society actors and the acceptance of the output (β=-.13, p=.02). This effect indicates that higher representation of these actors within a decision-making process diminishes the acceptance of the output of that process. For a rough follow-up of this unexpected effect, I looked at the analysis of acceptance in closer detail and ran a linear regression with acceptance as dependent and convergence of perspectives and the interaction of influence and involvement as independent variables. Figure 9.5 shows this interaction effect between influence and involvement in particular. The Figure depicts the linear relationship between involvement and acceptance in cases where participants' influence on the decision is very high (dashed line) or very low (bold line), controlling for the convergence of perspectives. If influence is high, that is, participants have full power over the decision, predicted values for acceptance are more or less constant, or decrease only slightly with increasing levels of involvement (dashed line). In cases

Predicted values of Acceptance
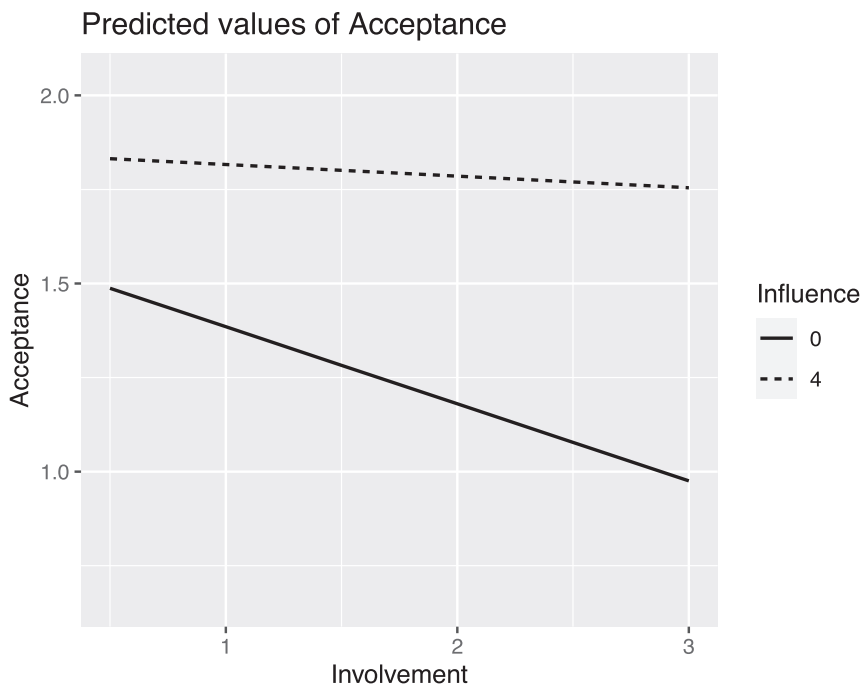
Figure 9.5. Interaction plot with acceptance as dependent, and the interaction of involvement and influence (plus convergence of perspectives) as independent variables

Note: Grey shading depicts 95% confidence intervals.

where influence is low, however, a more pronounced negative effect can be observed, with higher levels of involvement leading to decreasing acceptance levels (bold line).[4] This suggests that the negative effect of involvement is particularly pronounced in those cases in which participants are granted little influence over the output, which is discussed below.

DISCUSSION AND CONCLUSIONS

This study aspired to gain insights into the questions if and how democratic innovations and public participation lead to environmentally favourable and socially acceptable outcomes, paying particular attention to the pathways through which intermediate social outcomes mediate this relationship.

A first analysis of the interlinkages among intermediate outcomes revealed that these outcomes form two distinct, but related, clusters: one capturing the capacities participants and stakeholders built up during the participatory

process (including individual capacity-building; social learning; and network formation) and another expressing how actors realise their common ground and how their perspectives converge (including conflict resolution; trust-building; mutual gains and shared norms). The composition of these clusters highlights that immediate and individual gains interact with more deep-rooted and societal factors to form a bigger picture. The latent variable of capacity-building, for example, also includes, apart from social learning and individual capacity-building, network formation, emphasising the structural component of learning processes (Bodin, García, and Robins 2020). On the other hand, immediate gains, such as win–win solutions and conflict resolution, co-vary with more deep-rooted dynamics such as trust-building and shared norms, highlighting the essential function of trust and social capital as 'lubricant and glue – that is, they facilitate the work of collaboration and they hold the collaboration together' (Bryson, Crosby and Stone 2006: 47).

These two clusters of intermediate social outcomes were then used as latent variables in a structural equation model to trace the pathways through which the dimensions of participation – involvement of citizens and civil society, deliberation, and influence of participants on the output – impact the environmental standard and social acceptance of governance outputs. Overall, the results support the general hypothesis that democratic innovations and public participation positively affect both the environmental standard and the social acceptance of governance outputs. Looking at the specific dimensions of participation in detail, it becomes apparent that these work through diverse pathways. In line with conceptual assumptions, deliberation appeared as a strong predictor for both capacity-building and the convergence of perspectives, emphasising the pivotal role of high-quality communication for realising an array of social outcomes, such as learning, conflict resolution or trust-building. These social outcomes, in turn, serve as mediating factors through which deliberation influences the environmental standard and the acceptance of governance outputs.

In terms of the influence that participants have over the governance output, a different pattern emerges. This participatory dimension shows a strong significant effect only for the convergence of perspectives, indicating that social outcomes, such as conflict resolution, trust-building and identifying win–win solutions, depend on participants having some space to interact, to manoeuvre, and to determine decisions. But beyond its significant influence on these intermediate outcomes, influence has also shown substantial and significant direct effects on the environmental standard and social acceptance of the governance output. This strong role of political power indicates that taking participants seriously as political agents over their environment and their decisions is an important factor for realising governance outcomes that both benefit the environment and are considered acceptable (Kochskämper *et al.* 2018; Emerson, Nabatchi and Balogh 2012). For organisers of democratic

innovations, these findings suggest that strong commitment to the process, and to participants' ideas and solutions, are instrumental for arriving at environmentally and societally successful decisions.

The only other variable with a significant effect on governance outputs, both their environmental standard and social acceptance, was the intermediate outcome of convergence of perspectives. These findings are in line with previous research that claims that convergent perspectives in the form of win–win solutions, gained trust or resolved conflict made a high environmental standard more likely (Innes and Booher 1999), and increased the social legitimacy and acceptance of decisions (Birnbaum 2016). On the other hand, the results did not show any significant positive effect of capacity-building and learning for environmental standards, nor for the acceptance of governance outputs (*see also* Heikkila and Gerlak 2013; Newig *et al.* 2019). While this does not mean that such social outcomes are without individual, collaborative, and societal value (Scott and Thomas 2017), it suggests that there may be other mechanisms at work through which public participation may enhance the environmental standard and acceptance of governance decisions.

Finally, the analysis yielded somewhat unexpected results concerning the involvement of citizens and civil society actors. While a broad representation of these actors had a small, but positive effect on capacity-building during the process, it appears to be detrimental for the acceptance of governance output. One interpretation of this result could be that increased involvement might also imply a larger variety of interests and perspectives. Such a situation of increased heterogeneity of viewpoints might lead to more veto-players and a decreased decision space that appears acceptable to all those involved, in turn making broadly accepted decisions less likely (Newig *et al.* 2018). In this vein, broad representation may run the risk of uncovering or fuelling new conflicts between participants, or of making previously uninformed stakeholders aware of their opposition to a given governance solution (Coglianese 1997).

A rough additional analysis gave further insight into this negative effect of involvement, as it highlighted that this effect is particularly pronounced in cases in which participants have little influence over governance outputs. These findings may give some tentative insights into how acceptance and social legitimacy may be gained (*cf.* Birnbaum, Bodin and Sandström 2015). While substantial influence over a governance decision may encourage a feeling of ownership, or foster the compatibility of the decision with participants' goals and thus contribute to its wider social acceptance (Brody 2003; Newig *et al.* 2018), a similar effect could not be observed for a broad representation of citizens and stakeholders. In fact, representation without influence may lead to situations in which participants feel detached from the process and the resulting decisions; in turn, this may decrease acceptance of that decision. For organisers of democratic innovations, this suggests that merely assuring

representation may not be enough to design a successful process; instead, neglecting the further procedural qualities of the process and accounting for the heterogeneity of perspectives may even aggravate the situation and lead to an outcome with little societal support and acceptance. In any case, more research will be needed to validate and understand these potentially negative effects of participation.

To conclude, this analysis has shown how different participatory dimensions of democratic innovation enhance the environmental standard and social acceptance of governance outputs, highlighting, in particular, the role of social outcomes mediating this relationship. I detected a generally positive effect of participation on most of these societal and environmental outcomes, especially where deliberation quality is high and where participants are granted meaningful decision powers. The analysis provided further insights into why actors more or less accept governance outputs, depending on the participatory qualities of decision-making processes.

NOTES

1 This paper departs from the research approach and argumentative structure of a previous study (Jager *et al.* 2020) that analyses a similar question in the broader context of collaborative governance. Data and methods have been adapted to fit this study's narrower focus on democratic innovations and citizen participation.

2 This was assessed through the variable 'representation of citizens' >1 (on a scale from 0 to 4).

3 Fisher's C=5.565, p=0.696.

4 This trend can also be observed, in a slightly less pronounced way, when not grouping by the extreme values of influence, but when using mean +/- 1 standard deviation as grouping values.

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