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Reflexively engaging with technologies of participation: constructive assessment for public participation methods

Jan-Peter Voß

Abstract

The chapter provides a view of the ongoing innovation of ‘citizen panels’ as a method public participation. It shows how recourse to technoscientific modes of political ordering is met by reflexive engagements. Critical academic discourse, direct protest actions, and dedicated assessment exercises work together as a form of informal technology assessment. They counter the emergence of a transnational technocracy of political procedure. A closer look at an assessment exercise on the future development of ‘citizen panels’, carried out April 2014, reveals the potential and irony of reflexive engagements with technologies of participation. The conclusion extends this to other areas of social innovation.

Introduction

In this chapter, I do two things. First, I briefly reconstruct how political participation becomes technologised and argue that there is a modal shift in how constitutions of democracy are built: from politics to technoscience. I discuss how this modal shift is accompanied by reflexive engagement practices that counter technoscientific closure and seek to open up and repoliticise methods of public participation. Second, I give a more detailed account of a recent interactive assessment exercise on the future development of citizen panels. It was an attempt to apply methodological considerations of constructive technology assessment (CTA) to the ‘social technology’ of participation methods. The chapter discusses how the exercise engages with the innovation of citizen panels, but also how, as an expertly devised method, it may itself be conceived of as further instance of the technoscientisation of governance. In conclusion, I return to the overall innovation dynamics of public participation methods. I show how technoscientisation and reflexive engagement make a precarious balance in coping with ambiguities of innovation, and I briefly discuss what this means for wider areas of ‘social innovation’ and their links with issues of ‘responsible research and innovation’.

Technoscientisation of politics

What do I mean by the awkward term ‘technoscientisation’ and by saying that public participation becomes ‘technoscientised’? Very briefly, I refer to a process that makes the reality and working of public participation an object of scientific analysis and technological control. That implies the application of a technoscientific mode of innovation for the remaking of political order. This particular mode of innovation works through the configuration of phenomena in ‘secluded research’, by a collective of trained experts in protection from uncontrolled interference of the wider world (Callon et al. 2009: 46-70). The results of secluded research, however, are presented to the public, not as a proposal whose reception and expansion may be considered politically, but as insights into the nature of things and objective representations of ‘the’ reality. The technoscientific mode of innovation draws on epistemic authority to legitimise projects of collective ordering. Scientifically demonstrated functions become realised not as a deliberate remaking of reality, but as the application of knowledge about nature and more or less passive adaptation to the conditions that it holds ready.¹

¹ This is a basic understanding of technoscience that has been developed on the basis of Gaston Bachelard’s pioneering of a performative theory of science and further developed in laboratory studies (Bachelard 1984 [1934]; Hacking 1983; Knorr-Cetina 1995; Latour 1999).

For the case of public participation technoscientific innovation means that model realities of participation are expertly constructed and presented as insights into the nature of politics and the conditions for effectively articulating concerns and views of ‘the’ public. The replication of experimentally demonstrated and theoretically explained effects then requires the model reality to be rebuilt in different places and on a broader scale. Locally configured political reality has to be technically fixed and made transportable. This is what methods of public participation do. In order to realise particularly theorized functions they prescribe certain ways of enacting political reality.

Technoscientific innovation can be highly productive. It allows contentious questions of collective ordering to be sorted and negotiated in small and disciplinary aligned groups of experts. Their construction of proto-orders in strategically purified environments, if presented as a discovery of functional patterns in reality *as it is*, does not appear as an intervention to change and re-order the world, but rather as a clever way of coping with naturally given conditions. The replication and up-scaling of laboratory realities can thus rely on epistemic authority; it does not require the construction of political authority in order to orchestrate collective action.

In application to questions of democracy the technoscientific mode offers a way to avoid cumbersome and contingent political processes of reconfiguring political order. Composing political phenomena and functional effects (such as the legitimacy of representative procedures) in the mode of secluded research provides protection from the wider world of politics ‘in the wild’, with diverse and irreconcilable worldviews, values and interests that may become mobilized in non-transparent and uncontrollable ways. By shifting questions of political order into the laboratory, by turning them from matters of concern into matters of fact, the design of representational procedures becomes a technical problem whose solution is to be justified on the basis of objective functionalities, not on grounds of collective autonomy and will. Politics, as a process of performatively representing collective subjects and their common will, can thus be bypassed in defining the fundamental purpose and functions of political representation (Arendt 1979 [1969]; Rosanvallon 2006; Latour 2003; Disch 2012).

The technoscientific mode can be productive for the re-making of political reality, just think of the engagement of political science, law, economics and sociology in matters of state, democracy and governance (cf. Ezrahi 1990; Desrosières 1998; Osborne and Rose 1999). As much as technoscience substitutes for political modes of ordering political reality, however, it does so at a cost. That is linked to a shift from political to epistemic authority. The re-making of political order is no longer justified by collective will, but by reference to factual conditions and functional necessity. It changes the way how people can relate to and engage with the process of collective ordering. Participation in political ordering requires a voice to articulate a subjective opinion or to refuse incorporation into a proposed representation of the collective. Participation in the negotiation of factual conditions of politics requires expert status and the wielding of an experimental apparatus to assert alternative political realities. The problematisation of a technoscientific displacement of politics in science and technology studies (STS) was mostly with a view to natural sciences and engineering, not so much with regard to the social sciences and how they are involved in producing collective order (see Irwin 2008; Camic et al. 2011). Shifting over to the making of political reality, however, we mainly get to do with the work of the social sciences and the establishment of ‘social technology’².

² Social technology here refers to ‘configurations that works’ (Rip and Kemp 1998), which are composed of heterogeneous (material, human, semiotic) elements but where, in public perception, social practices are foregrounded. The STS perspective shows that social elements are constitutive of practically working

We may more specifically speak of public participation methods as a technologies of politics, democracy or community (Barry 2002; Rose 1999: 188; Irwin 2001; Laurent 2011b). They promise to provide a true view of ‘the public’ for reference by those who seek to legitimize actions as ‘collective’ or ‘public’ rather than private, partial or partisan. They prescribe procedures for articulating a collective will of the public. As such they determine the purpose and product of political interactions, the eligible issues, duration and location of meetings, the composition of panels and required qualifications and forms of conduct by participants and moderators, tools of facilitation and the input of information into the process. This makes them ‘machineries for making publics’ (Felt and Fochler 2010). If successfully established they may come to be seen as the natural way for publics and their collective will to exist, just as national elections, parliaments and opinion polls are now.

The problematisation of public participation methods as ‘technologies’ corresponds with a gradual shift in patterns by which they are articulated, advocated, and spread – a shift from practices embedded in local political cultures and issue areas, normatively justified and disciplined in situated negotiations over the purpose and design of particular participation projects, to the design of standard methods in transnational expert networks, their epistemic-technical justification, also by evidence about ‘universal’ functionalities from laboratory experiments, and their global marketing as new tools of democracy (for emphatic accounts see Sulkin and Simon 2001; Carpini et al. 2004; Karpowitz and Mendelberg 2011; for more skeptical accounts see Laurent 2009; Laurent 2011b; Bogner 2012). In the course of this process political participation becomes increasingly objectified as a tool of governance. Even leading political scientists who discuss prospects of democratising global governance defer the design of public participation procedures to experts who are trusted to care that ‘there is technology for that’.³

In order to reliably reproduce an expertly modelled function of participation political subjects have to be disciplined to perform the model, for example, by practicing communicative rationality in order to produce public reason that transcends particular subjective positions and can thus legitimise public action (Habermas 1981, 1993). Democracy is reinvented along particular expertly devised models. This implies a technoscience of political culture. Collective ‘imaginaries of democracy’ (Ezrahi 2012) are constructed with help of the laboratory. In this way new methods of participation establish alternatives to incumbent technologies of liberal-representative democracy like elections and parliaments. The latter were established in extended political struggle and are territorially and culturally anchored (Heurtin 2005). The new technologies are mobile, they can flexibly be deployed as ready-made political representation devices for specific issues and decision problems (cf. "instant democracy", Sloterdijk and Mueller von der Haegen 2005). Their circulation and installation silently punctuates ponderous technological infrastructures of representative democracy.

The interrogation of ‘technologies of participation’ is linked to a concern for the “collateral realities” that they produce (Law 2011). This includes, for example, the negation of creative political agency of participants in defining their roles or of situated judgments on appropriate and effective procedures. It is cautioned that, if experts assume the power to define political subjects and adequate forms of conduct (Rose 1999; Braun and Schultz 2010), this may, paradoxically, undermine democratic empowerment rather than enhance it (e.g. Levidow

configurations such as bicycles, cars, or electricity systems (Pinch and Bijker 1987; Callon 1987; Hughes 1987). Likewise it acknowledges that material elements are part of practically working participation methods and other social technologies.

³ Robert Goodin, in a discussion following his talk ‘How Deliberative Democracy Can Make International Law’, 26 September 2012, at the University of Tübingen, at the German Political Science Association’s conference ‘Promises of Democracy’.

1998; Irwin 2001; Lezaun and Soneryd 2007; Wynne 2007; Felt and Fochler 2010; Bogner 2012; Chilvers 2013). The irony is that the establishment of expertise about public participation is linked with an anti-technocratic project, the attempt to work against substantial technocracy with regard to issues of policy decision, but it gives rise to a new technocracy of political agency and procedure (Voß and Amelung 2013). That very problematisation of public participation is part of their ongoing innovation process.

The innovation of citizen panels

I turn to the interlinked innovation of ‘citizen panels’ as a particular set of public participation methods that, throughout the last decades, expanded globally across jurisdictions and issue areas (for a more extensive account see Voß and Amelung 2013; Amelung 2012).⁴ The umbrella term comprises the methods citizens’ jury, planning cell and consensus conference. They all prescribe the convocation of groups of 10-25 randomly selected citizens to produce a public judgement on a given issue of concern. Participants are provided with factual information and expert statements on the issue, and a moderator facilitates their deliberation. The procedure usually takes a few days and the resulting consensus is reflected in a report with policy recommendations. Originally, citizens’ juries, planning cells and consensus conferences emerged independently in different contexts in the 1970s and 1980s. At the beginning of the 1990s their innovation journeys became entangled and since about 2000 they are discussed and further developed under the umbrella term of citizen panels (Brown 2006; Hörning 1999).

The overall process of their development can be interpreted as a truncated version of an ‘aggregation’ pattern which describes an ideal type of technological innovation in which situated, practical knowledge gradually becomes explicated, objectified, codified and thereby decontextualized, meaning that local technological practices become part of cosmopolitan regimes of knowledge (Disco et al. 1992; Deuten 2003; Geels and Deuten 2006). Design practices that emerged locally in particular historical settings are successively drawn into the laboratory in order to define a global technical standard. From a relating of different local knowledges ‘bottom-up’ follows the building of generic categories and frameworks for comparison, which take on a life of their own and develop into abstract global models that come to define local practices ‘top down’. In the case of citizen panels we find an incomplete version of this pattern (see Figure 1): Incipient technoscientific dynamics did not lead directly into a global regime and a dominant model. Instead they gave rise to reflexive forms of engagement that counter the looming shift from open, situationally embedded innovation to a configuration of universal methods in transnational expert networks.

⁴ I build on research which sought to trace instances in which citizen panels became articulated both as abstract models and as implemented configurations of specific political situations. Such instances were drawn from academic literature, project documents, method manuals, policy reports and websites as well as thirty personal interviews and a group discussion with twenty-five actors who were practically engaged in the process. The overall pattern of the process was reconstructed in an iterative process of pattern matching and abduction for which we referred to a repertoire of concepts from science, technology and innovation studies (cf. Van de Ven 2007; Van de Ven et al. 1999; Yin 2003). I acknowledge funding by the German Federal Ministry of Education and Research (BMBF) through Grant No. 01UU0906 and thank Nina Amelung and Louisa Grabner who did large parts of the empirical research and Carsten Mann and Till Runge who organized the constructive assessment workshop on which I report later on.

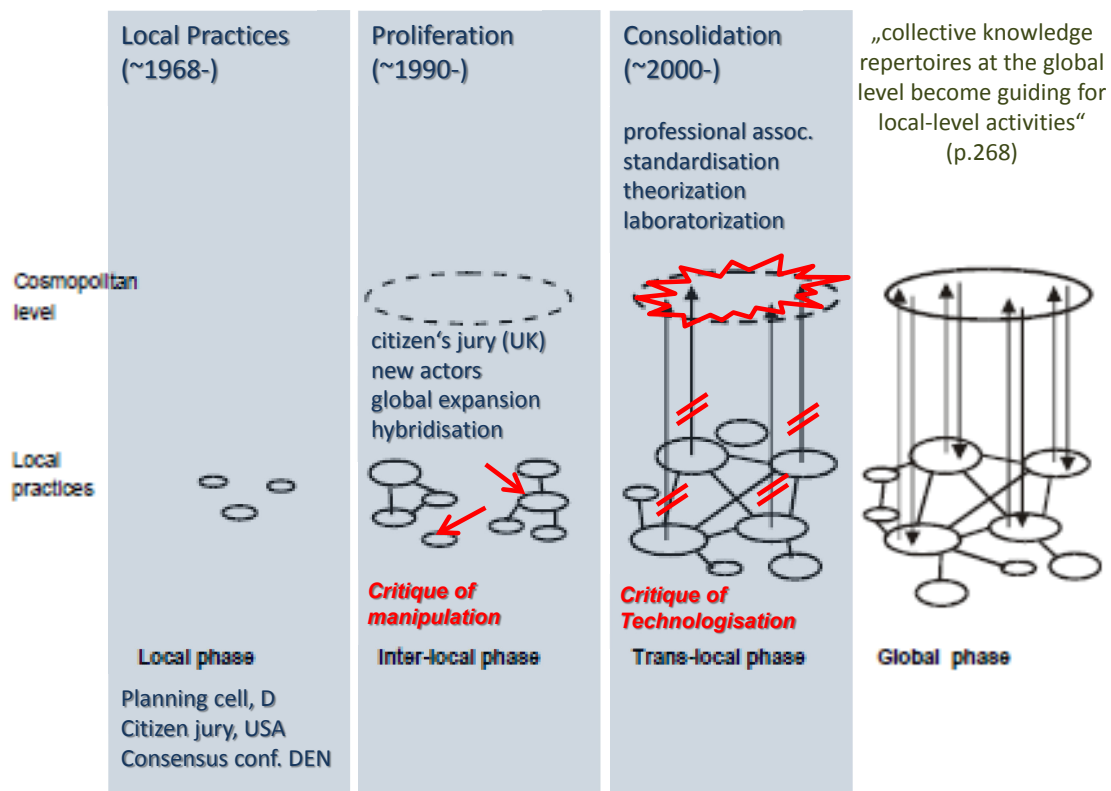


Figure 1. The innovation journey of citizen panels as a truncated process of ‘aggregating’ technical knowledge and practices of participation (adapted from Geels and Deuten, 2006: 269).

Local practices

The doing of citizen panels began as dispersed und unconnected local practices of organising procedures to involve citizens in the deliberation of public policy issues (see Figure 1). Planning cells developed in the context of municipal planning in the German state of North-Rhine Westphalia (Dienel 1971; Dienel 1978), the citizen jury emerged in a civic education context in the state of Minnesota in the USA (Crosby 1974, 1975), and the consensus conference developed in a context of technology assessment in Denmark (Joss and Durant 1995; Andersen and Jæger 1999). The different approaches agreed that citizens should provide constructive input to authoritative decision-making on contested issues. They sought to make public engagement productive by offering organizational support for citizens to articulate a coherent view of the public. Methods were developed through practical tinkering, guided by general philosophical considerations. They took shape in the course of pragmatically coping with circumstances and opportunities, such as alliances with local politicians and activist groups. There was no explicit functional theory on how participatory procedures work but the general idea of facilitating the articulation of a consensus among ordinary citizens. The know-how of doing citizen panels was embedded in local communities of practice which were led by entrepreneurial figures. Learning was a matter of socialization and practical experience on the job (Vergne 2010; Gastil and Keith 2005; Hendriks 2005).

Proliferation

Towards the end of the 1980s, all three methods were dislodged from their niches and they proliferated into new areas. Procedures were documented in books and articles and started to circulate across cultural and political contexts and issue areas (Renn et al. 1995; Stewart et al. 1994; Coote and Lenaghan 1997). Around the year 2000, several reports and overviews listed citizen panels as elements of a universal toolkit for public participation (e.g. OECD 2001;

Elliott et al. 2005). With surging political demand for public engagement services in the second half of the 1990s, new actors from commercial consultancy and marketing entered the field. A hot spot was the UK (Chilvers 2008). Citizen panels were hybridized with polling, focus groups and public relations methods. The cultural embedding and coherence of citizen panel practices eroded and they lost trust in the media discourse of the wider public (Wakeford et al. 2007). Citizen panels were criticized for ‘whitewashing’ governmental strategies by manipulating citizens to produce views that were aligned with predefined policy decisions (Levidow 1998; Parkinson 2004, 2006; Hendriks and Carson 2008).

Technoscientific consolidation

In the first half of the 2000s, partly in response to problems with wider public acceptance, efforts increased to systematise design knowledge and regulate the wild spread and modification of public participation methods. Translocal frameworks were developed to relate with each other and order a variety of practices that had emerged from interlocal exchanges and hybrid developments. Their working was to be made more transparent and reliable, more objective, ultimately with a view to professionalise and discipline the practices of doing participation as a move to regain trust (cf. Porter 1996). In this context, the term citizen panels became established as an umbrella term to align the methodological development of planning cells, citizen juries and consensus conferences (Hörning 1999; Brown 2006).⁵ Academics provided systematic comparisons and evaluations of public participation exercises (Rowe and Frewer 2000, 2005; Fung 2006). Internet platforms, academic journals and professional associations were established to develop a shared discourse and establish global knowledge of quality criteria and standards of good practice.⁶ Governmental institutions supported the development of a shared body of knowledge and design standards which could provide devices that could be reliably used to compensate alleged deficits of liberal-representative democratic legitimation.⁷ Transnational entrepreneurs of participation methods set up experiments to demonstrate the applicability of citizen panels also for issues of global governance.⁸

The establishment of standard definitions, quality criteria and design specifications required more explicit theoretical explanations of how citizen panels worked (Brown 2009; Lövbrand et al. 2011; Renn and Schweizer 2009). This made a productive link with research on theories of deliberative democracy which were perceived to lack empirical grounding (Smith and Wales 2002). Citizen panels so became incorporated as practical exemplars of deliberative democracy and, in exchange, could draw on the theoretical apparatus for explicating their functionality. The tinkering with designs in practice was complemented by

⁵ Occasionally other terms are used such as deliberative fora (Hendriks and Carson 2008), mini-publics (Goodin and Dryzek 2006), and hybrid fora (Callon et al. 2009).

⁶ Platforms like www.participedia.net, www.peopleandparticipation.net, www.partizipation.at, the Journal of Public Deliberation (<http://www.publicdeliberation.net/jpd/>), the Deliberative Democracy Consortium (<http://www.deliberative-democracy.net>), or the International Association for Public Participation (<http://www.iap2.org/>).

⁷ Most prominent is the engagement of the EU Commission in commissioning expertise and collaborative projects for negotiating design standards, as well as implementing and evaluating experiments on European policy issues. Such projects include ‘Participatory approaches in Science and Technology (PATH, 2004-6)’, ‘Citizen participation in science and technology (CIPAST, 2005-8)’, ‘Meeting of Minds – European Citizens Deliberation on Brain Science (2006) (IFOK 2003; Goldschmidt and Renn 2006; Abels 2009)’. Also national governments sought to develop a robust methodological basis for public participation, for example ‘Sciencewise’ in the UK (<http://www.sciencewise-erc.org.uk/>, cf. Chilvers, 2010) or activities by the German Office of Technology Assessment (Hennen et al. 2004).

⁸ The Danish Board of Technology developed ‘World Wide Views. A methodology for global citizen deliberation’ (<http://www.wwviews.org/>) with a first demonstration project related to negotiations under the UN Convention on Climate Change (World Wide Views on Global Warming, 2009) and a second one on negotiations under the UN Convention on Biodiversity (World Wide Views of Biodiversity, 2013).

the testing of design features in laboratory experiments (Carpini et al. 2004; Sulkin and Simon 2001). The move to the laboratory made it possible to establish unified and coherent definitions of the function of citizen panels as well as quality criteria and design specifications. Authoritative expertise on procedural matters of political participation slowly emerged. Citizen panels came to be organised with a view to experimentally demonstrate a general theory of participation (Laurent 2009; Laurent 2011b; Bogner 2012; Sebastian forthcoming). Procedures were increasingly designed in controlled experimental settings, far off from particular sites of application.

Reflexive engagement

The gradual technoscientisation of citizen panels became problematised early on. One form of reflexively engaging with the development was in an emerging critical discourse. Academic work exposed the social dynamics, contextuality, contingency, and politics of participatory methods. It deconstructed objective functionality by empirically studying participation methods in the making and at work (Irwin 2001; Gomart and Hajer 2003; Lezaun and Soneryd 2007; Lezaun 2007; Chilvers and Burgess 2008; Horst and Irwin 2010; Felt and Fochler 2010). This showed the situational embedding and inherent bias in any particular procedure for constructing a public view and it included the warning that the instrumentalisation of citizen participation can undermine rather than promote the legitimacy of collective decisions (Wynne 2006). The natural link of participation with theories of deliberative democracy was challenged by reference to alternative political ontologies which emphasised situated sense-making, different identities, irreconcilably diverse rationalities, and hegemonic discourses (e.g. Dewey 2012 [1954]; Freire 2000 [1970]; Laclau and Mouffe 2001). The critical discourse worked to deconstruct the notion of participation methods as politically neutral, functional tools. By highlighting underlying ontological assumptions, non-existent design decisions, situated agency, and latent impacts, it disrupted the expertocratic immunization of their design and created openings for political engagement.

Another form of reflexively engaging with the establishment of a dominant professional discourse and design for citizen panels was the development of alternative designs which were explicitly geared to grant citizens agency in defining the issues and designing procedures of their engagement. A prominent example was the proposal of a 'Do-It-Yourself' citizen jury by PEALS at the University of Newcastle which was to support citizens in organising themselves and articulating marginalised viewpoints to counteract dominant discourse (Wakeford 2003; Wakeford and Singh 2008). Yet another form were protest actions, in similar ways as known from other areas of contested technology development. A silent form of protesting was to stay away and refuse being instrumentalised in organised exercises of public participation (Maier 2009). More active contestation could be found in legal challenges of public consultation exercises, like an accusation of the UK government by Greenpeace and judicial judgment of participation on nuclear energy being 'seriously flawed' and 'procedurally unfair' (Chilvers and Burgess 2008: 1895; Greenpeace 2007). More overt resistance and sabotage against technologies of participation can be observed in the strategic disruption of an organised 'public debate' on nanotechnology in France. The protest movement Pièces et Main d'Ouvre (PMO) pursued a radical critique of technologisation by seeking to break down preconfigured dialogue and participation exercises which were positioned as 'social technology' to co-opt publics for the technological discourse (Laurent 2011a). Taken together, these different forms of reflexive engagement contributed to their innovation process by bringing dimensions beyond narrowly conceived functions into view and by stimulating controversial public debates. They worked as informal technology assessment for emerging technologies of participation. They (cf. Rip 1987 on public controversy as informal technology assessment).

In addition to that, also more explicit forms of assessment for increasingly technoscientised participation methods started to be discussed: “Now that forms of public dialogue are a site of innovation and professionalisation as part of a global public engagement industry perhaps (...) there is a need for anticipatory assessment of these social (science) ‘technologies of participation’ themselves.” (Chilvers 2013: 306). Accordingly, ‘reflexive learning about public dialogue’ would require “actors...to actively acknowledge, reflect on, and openly express to others their underlying assumptions, motives and commitments relating to the forms of public dialogue they orchestrate or are exposed to, rather than treating dialogue and engagement (and learning for that matter) as a homogeneous, reified, and acontextual technical procedure” (Chilvers 2013: 301). The workshop series from which this book has grown is an example of this kind of engagement (as introduced in the Preface and noted in Chapter 14 of this volume). In the following section we turn to another example: an experiment with adopting methods of constructive technology assessment (CTA) to stimulate reflexive interactions among practitioners of citizen panels on their future development.

For a brief summary of the innovation journey of citizen panels we may hold that, over the last four decades, it went on as a gradual process of technoscientification. It resembles an ‘aggregation’ patterns observed in other areas of technology development where local practices become connected, then overarched and finally controlled by abstract functional representations that are composed in global centres of expertise. So far, however, the innovation journey of citizen panels depicts a truncated version of this process. Design work in the mode of ‘secluded research’ (Callon et al. 2009) and increasing technoscientification of public participation is met by a critical academic discourses, alternative designs, direct protest actions, and dedicated assessment exercises. Together these different forms of reflexive engagement work to counteract the reification of public participation by a global theory and a dominant design.

‘Challenging futures of citizen panels’

Let’s now have a closer look at the mentioned constructive assessment exercise for citizen panels. It is here presented as another instance of reflexive engagement with technologies of participation that I myself have been practically involved with as an organiser. I can here reflect on this engagement with regard to how it is related with the ongoing innovation process. The exercise went under the title ‘challenging futures of citizen panels’. The approach was inspired by concepts like constructive technology assessment (Rip et al. 1995; Schot and Rip 1997; Rip and Schot 2002), hybrid fora (Callon et al. 2009), real-time technology assessment (Guston and Sarewitz 2002) or anticipatory governance (Barben et al. 2008; Guston 2013) (Mann and Voß forthcoming). An overall orientation was to stimulate interactions across ongoing strands of activities which shape the design and development of citizen panels. Various concerns and requirements were to be articulated, and confronted with each other in order identify critical issues for a robust approach of innovation. The exercise sought to open the debate on particular modes and designs for developing citizen panels in the future. To this end it brought actors beyond the usual in-groups of experts together and demonstrated challenges of negotiating diverging and irreconcilable constructions of reality, attributions of purpose and functionalities, as well as various situated practices of doing participation. It contributed to the reflexive pluralisation of conceptions and appraisals of citizen panels and raised awareness of fundamentally political issues connected to apparently technical design problems (Stirling 2008).

At the centre was a workshop with 25 actors who were in different ways practically involved in the development of citizen panels, both in more affirmative and critical perspectives. Participating actors were identified on the basis of research into the historical development of

citizen panels. Some of them were engaged in the academic design and theorisation of methods, others as professional operators and commissioners, or as activists and critical commentators. The selection did not aim to be comprehensive or representative, but it was oriented by the attempt to create a marginal opening in the debate by providing for interesting encounters, contrasting realities, and the articulation of controversial issues. Table 1 lists the workshop attendees.

No.	Name	Organization
1	Abels, Gabriele	Eberhard Karls Universität Tübingen, Department of Political Science
2	Banthen, Hennig	IFOK Institut für Organisationskommunikation (Bensheim)
3	Brown, Mark	California State University, Department of Government
4	Chilvers, Jason	University of East Anglia, School of Environmental Sciences
5	Crosby, Ned	The Jefferson Center for New Democratic Processes (St. Paul, MN)
6	Dienel, Liudger	NEXUS, Institute for cooperation management and interdisciplinary research (Berlin)
8	Font, Joan	Instituto de Estudios Sociale Avanzados, Córdoba
9	Galiay, Philippe	European Commission, Directorate-General for Research and Innovation
10	Gastil, John	Pennsylvania State University, Department of Communication
11	Hennen, Leonhard	Office for Technology Assessment at the German Bundestag
12	Huitema, Dave	VU University Amsterdam, Institute for Environmental Studies
13	Joss, Simon	University of Westminster, Department of Politics and International Relations
14	Lietzmann, Hans J.	Bergische Universität Wuppertal, Research Center in Public Participation
15	Lopata, Rachel	Community Research and Consultancy Ltd (Leicester)
16	Masser, Kai	German Research Institute for Public Administration (Speyer)
17	Prikken, Ingrid	Involve (London)
18	Rauws, Gerrit	King Baudouin Foundation (Brussels)
19	Schweizer, Pia-Johanna	Universität Stuttgart, Department of Social Science
20	Shinoto, Akinori	Junior Chamber International Japan
21	Soneryd, Linda	University of Gothenborg, Department of Sociology
22	Sturm, Hilmar	Society for Citizens' Reports (München)
23	Wakeford, Tom	University of Edinburgh, School of Health in Social Science
24	Walker, Ian	New Democracy Foundation (Sydney)
25	Worthington, Richard	The Loka Institute (Claremont, CA)

Table 1. Attendees of ‘Challenging futures of citizen panels’ workshop, 26 April 2013 in Berlin.

In the run-up to the workshop participants were presented with a set of three scenarios which exemplified dynamics and possible tensions that may shape the future innovation process (Mann et al. 2013). They were constructed on the basis of research into the historical innovation dynamics of citizen panels. Each scenario presented the rampant expansion of a particular rationality that was at play in shaping the innovation in the past. Table 2 gives an overview of the scenarios.

Scenario A: Market for deliberation services	Scenario B: Toolkit of democracy	Scenario C: Public reason machine
Business interests drive the development of citizen panels. Methods are shaped in a logic of supply and demand. Stimulation of demand and strategic creation of new markets for participation services is a core activity of a specialized consultancy and services sector. Scientific support is mobilized to establish the urgency of a crisis of representation, the requirement to directly engage citizens for democratic legitimation, and to push particular standards of citizen panel design and conduct – also with a view to saving shares in a highly competitive market. Demand can be generated with governments, particularly, if they don't rely on liberal-representative procedures for legitimation. But also firms, international organizations and large research projects contract those services.	Competing visions of political order drive the development of citizen panels. Development of methods is shaped in view of their performative effects, how they enact a particular reality of citizenship, democracy, and political order. Activists and stakeholder groups explicate alternative political visions and struggle over their realisation, they engage with the negotiation of participatory procedures within and for particular political situations. Design knowledge for citizen panels takes shape as a diverse, controversially discussed repertoire of principles, storylines, methodical components, and practices which is selectively drawn on in local situations.	Scientific efforts at theorising and optimising deliberation drive the development of citizen panels. Development of methods is shaped in laboratory experiments to theorise and set up arrangements that produce public reason, and to technologically replicate their function. Institutional approaches are combined with neuro-biology and artificial intelligence to fix configurations of enhanced human interaction that reliably determine rational public will. Proven superior performance helps an emerging high-tech industry to install them globally and replace elections, voting, wild debate, protest, and other more primitive democratic techniques.

Table 2. Overview of scenarios on the future development of citizen panels.

At the workshop participants were prompted to articulate challenges that may come up in the future development of citizen panels, both against the background of their own experience and the presented scenarios, and to discuss them with a view to identify ‘critical issues’ for the innovation process. The moderation aimed to have issues articulated from different angles and to have propositions made on how they should be dealt with.⁹ The discussion reflected ambiguities and controversial in the design and strategic development of citizen panels (e.g. purpose and function, selection of participants, quality control). An overview of the agenda of the workshop is provided in Table 3.

⁹ The workshop was introduced by members of the research team and moderated by a person with experience in constructive technology assessment exercises, with occasional support by members of the research team.

Friday, April 26, 2013	Venue: Berlin-Brandenburg Academy of Sciences and Humanities (BBAW)	
Introduction		
9:00-9:10	Welcome and overview	<ul style="list-style-type: none"> • Introduction to workshop objectives & expected outcomes • Overview of the agenda
9:10-9:30	Why this workshop?	<ul style="list-style-type: none"> • “Challenging futures” in relation with dynamics of the innovation journey of citizen panels
Session 1: Challenging futures of citizen panels		
9:30-11:00	Opening plenary discussion with general statements	<ul style="list-style-type: none"> • Table round: What characterizes the present situation of citizen panels development? • Open plenary discussion
11:00-11:30	Coffee break	
Session 2: Identifying and articulating future issues for citizen panels		
11:30-13:00	Group work: Discussion of future developments and identification of issues	<ul style="list-style-type: none"> • Identify specific issues that require further attention and/or debate in the future development of citizen panels, produce issue briefs
13:00-14:00	Lunch break	
Session 3: Compiling issues, discussing challenges		
14:00-14:30	Strolling the “wall of issues”	<ul style="list-style-type: none"> • Participants read and discuss issue briefs produced by working groups
14:30-16:15	Discussion of selected issues and challenges in plenary	<ul style="list-style-type: none"> • Moderators present two clusters of issues for discussion • Two discussion rounds in plenary, one for each cluster
16:15- 17:00	Concluding discussion in plenary	<ul style="list-style-type: none"> • Wrap-up of discussion of issues • Identify open questions and missed points • Outlook on further procedure

Table 3. Agenda of ‘Challenging futures of citizen panels’ workshop, 26 April 2013 in Berlin.

In the aftermath of the workshop tape recorded discussions were transcribed and analysed with regard to different views on key issues. This was further translated into a list of eight ‘critical issues’ for an ‘extended innovation agenda’ which highlights contentious questions and shows up the political implications of implicitly or explicitly deciding them (Mann et al. 2014a). For a list of the section headings that elaborate issues in more detail, see Box 1.

1. Functions of citizen panels: A matter of worldviews and philosophies?
2. Standardization: Toward unified citizen panel practices?
3. Quality: How to control the quality of citizen panels?
4. Impact: Do citizen panels need closer links with political decision-making?
5. Representation: Which is the public that citizen panels produce a view of?
6. Neutrality: Can power asymmetries and biases be evaded?
7. Context: Is the working of citizen panels depended on situational contexts?
8. Social life: What drives and shapes the innovation of citizen panels in practice?

Box 1. Headings of issue descriptions for an extended innovation agenda for citizen panels.

The agenda suggests wider public attention for those questions and a concern for the legitimacy of respective decisions, in order to make the innovation of citizen panels more robust for social and political complexities of the world in which they are to work. ‘Critical issues’ draw attention to impacts beyond narrowly modelled functions, they emphasise the constructedness and immanent bias of participation methods, and highlight their political salience.

Wider circulation of the ‘extended innovation agenda’ offers entry points for non-experts to engage with the ongoing process by making the design and deployment of citizen panels a public issue (cf. Marres 2005). The aim is to contribute to the politicisation of the ongoing innovation process, not by demonising hidden interests and mobilising for or against a particular design, but by showing up different partial realities that are connected with the process. The orientation is to cultivate a reflexive discourse and allow for open political debate of the collective ordering that is at stake.

The actual effect of this intervention remains to be seen. The interactions that took place at the workshop will have further effects in the practical engagement of participants with the innovation process. What specifically this effect will be, and how strong it will be, is likely to be different for participants. For the moment it is interesting to consider the workshop as another example of reflexively engaging with technologies of participation. No matter what its further impact will be, the workshop, the scenarios and the report have become part of the innovation journey of citizen panels. The process created new linkages between people, topics, concerns and arguments.

In a certain respect this engagement was special. It did not aim to add or strengthen a particular perspective in the innovation process, but it sought to orchestrate the collective movement from which it emerges. It was an engagement with the governance of the innovation process. This by itself may seem preposterous or overly assertive. But there is an aspect to it that may even be more crucial against with a view to the technoscientification of politics in the course of innovating participation methods. Did we, with the design of our ‘challenging futures’ method, also pursue a technoscientific approach to participation? The intervention was designed in a confined research collective, on the basis of a specifically reduced model of the innovation process. Important design decisions were taken ‘in seclusion’ such as the decision to invite diverse practitioners and stakeholders of citizen panels rather than citizen participants, or the particular setup for the scenarios, the agenda, the style of moderation etc. These decisions were not put up for wider discussion, neither with participants nor with a broader public. The workshop, finally, was set up as an experiment to probe adopted CTA methods in application to social technologies like citizen panels and other instruments of governance.¹⁰ It may thus be seen as just a further turn of the screw: Now we are moving towards technocracy of a third order which does not anymore regard substantial policy issues, nor public participation procedures, but innovation assessment procedures for participation methods. Even if we do not claim objectivity, neutrality or epistemic authority for our approach, we articulated it as an abstract, general procedure to be tested on different cases.

In this respect it is important to note that also here we find technoscientific modes of ordering countered by a contestation of procedures and the authority of experts. There is reflexive engagement also with this third order of technocracy. A workshop participant, for example, resisted and problematised the proposed procedure for the ‘challenging futures workshop’. And we received challenging questions and comments when we presented the project at academic conferences. Even our own questions and discussions during the preparation of the whole process may count as a kind of self-reflexive engagement with the trajectory of our own project. To date, no protest groups have run into our meetings. But this may come. If the ‘challenging futures’ method comes to be established as a universal standard for constructively assessing social technologies and governance instruments it will be challenged and seemingly technical design features will be politicized – hopefully.

¹⁰ An second experiment with an environmental market instrument (biodiversity offsetting and banking) was carried out a week later (Mann et al. 2014b).

Reflexive governance of social innovation

For concluding the chapter I come back to the broader topic of technoscientific innovation in political order. By having a closer look at the innovation of citizen panels, we encounter a precarious balance between technoscientificisation and politicisation. The dynamic of the innovation process emerges from the interplay of those different modes of engaging with methods of participation. Technoscientificisation and reflexive engagement are intertwined in a spiralling, dialectical movement. Initially, the technicisation of substantial policy issues is met by contestations which draw out political dimensions of their appraisal and stimulate broader participation. This prompted attempts to strengthen public participation, ultimately also by technicising the design of participatory procedures. Again this was met by reflexive engagements emphasising their political dimensions. The case of our constructive assessment exercise for citizen panels can be seen as part of broader set of activities to open the design of participation methods for the negotiation of diverse purposes and situational contexts. Yet, I have discussed how also the design of the assessment exercise itself may be contested again as a move of technoscientific closure, now with regard to the methods of method assessment. In the case of citizen panels, scientific objectification and control are obviously part of the innovation process. Questions of political constitution building are here, at least partly, decided by professional and epistemic authority. With regard to increasingly centralised practices of secluded research we may speak of an emerging technoscience of democracy. A special irony is that a new technocracy of political procedure emerges from the struggle against a technocracy of substantial policy decision.

But the case also shows that the technoscientificisation of public participation is immediately accompanied by reflexive engagement and debate. Critical academic discourse, alternative procedural designs, direct protest actions, and dedicated assessment exercises have a formative impact on the realisation of these new forms of political order. They thematise “collateral realities” of apparently technical devices (Law 2011; Law and Ruppert 2013) and so raise critical issues which show their political dimensions. They effectively contribute to explore robust pathways of innovation, even if they appear to work against innovation and slow it down.¹¹

A more general point follows from understanding critical questioning, opening and politicisation of designs as constitutive elements of innovation, just as much as the advocating, closing and objectifying of specific solutions. The dynamic balancing of technoscientific closure with political opening can be understood appears as a practical way of coping with the inherent ambiguities of any innovation. Any process of ordering is a non-exigent, partial reduction of complexity that excludes alternative realities. It implies a disengagement with the flow of situational interactions. It increases selectively directed, internal productivity at the expense of potential agencies. As such it is inherently dilemmatic (see March 1991 for a similar, but more strategic articulation of the exploration/exploitation dilemma in organizational learning). If there is no way to resolve the dilemma in a rationally coherent way, it may well be that the dynamic antagonism of technoscientific and political rationalities is a practical way of coping. What appears as struggle indeed works as interplay and balancing – similar perhaps to what party competition and institutional checks and balances do for the shaping of nation state politics. The point is that the contribution of reflexive engagements needs to be appreciated as a constitutive component of innovation and as a way of practically coping with inherent ambiguities of ordering.

¹¹ This interplay actually implies a dilemma for radical technological critique which becomes part of a reality that it seeks to disrupt. Perhaps disregard and refusal to engage with a rejected discourse would be more effective in this case, but this is another question which shall not be discussed here.

This may also be of wider relevance for the emerging ‘social innovation’ discourse. In contrast to technological innovations, social innovations are widely described as inherently empowering, just, beneficial, socially embedded and legitimate (e.g. BEPA 2011 and www.socialinnovationeurope.eu). There is no recognition, so far, of the need for accompanying assessment activities that would be comparable to what is known as ‘technology assessment’ (but see Maasen and Merz 2006). I tried to show that the innovation of public participation methods, as a particular kind of social innovation, exhibits patterns and problems of technoscience. The transformation of issues of collective ordering into technical design problems, together with their withdrawal from public debate, is accompanied by various forms of reflexive engagement which *de facto* take on the role of an emerging assessment regime. What makes an innovation prone to critical inquiry and debate is not the stuff that it is most visibly made of, but the mode by which it is assembled. As much as social innovation is technoscientificised it also throws up questions of ‘responsible research and innovation’ (Owen et al. 2012) and the need for “a transparent, interactive process by which societal actors and innovators become mutually responsive to each other with a view to the (ethical) acceptability, sustainability and societal desirability of the innovation process and its marketable products (in order to allow a proper embedding of scientific and technological advances in our society)” (Von Schomberg 2012: 48).

References

- Abels, Gabriele. 2009. *Citizens' deliberations and the EU democratic deficit. Is there a model for participatory democracy? Tübinger Arbeitspapiere zur Integrationsforschung 1/2009*. Tübingen: Universität Tübingen.
- Amelung, Nina. 2012. "The emergence of citizen panels as a de facto standard." *Quaderni* 79:13-28.
- Andersen, Ida-Elisabeth, and Birgit Jæger. 1999. "Scenario workshops and consensus conferences: towards more democratic decision-making." *Science and public policy* 26 (5):331-40.
- Arendt, Hannah. 1979 [1969]. *On violence*. Vol. Orlando: Harvest Book Harcourt.
- Bachelard, Gaston. 1984 [1934]. *The new scientific spirit*. Boston: Beacon Press.
- Barben, Daniel, Erik Fisher, Cynthia Selin, and David H. Guston. 2008. "Anticipatory Governance of Nanotechnology: Foresight, Engagement, and Integration." In *The handbook of science and technology studies*, ed. E. J. Hackett, O. Amsterdamska, M. Lynch and J. Wajcman. Cambridge: MIT Press.
- Barry, Andrew. 2002. "The anti-political economy." *Economy and society* 31 (2):268-84.
- BEPA. 2011. *Empowering people, driving change. Social innovation in the European Union*. Brussels: Bureau of Policy Advisors for the European Commission.
- Bogner, Alexander. 2012. "The paradox of participation experiments." *Science, technology & human values* 37 (5):506-27.
- Braun, Kathrin, and Susanne Schultz. 2010. "'... a certain amount of engineering involved': Constructing the public in participatory governance arrangements." *Public Understanding of Science* 19 (4):403.
- Brown, Mark B. 2006. "Survey Article: Citizen Panels and the Concept of Representation*." *The Journal of Political Philosophy* 14 (2):203-25.
- . 2009. *Science in Democracy. Expertise, Institutions, and Representation*. Cambridge, MA: MIT Press.
- Callon, Michel. 1987. "Society in the Making: The Study of Technology as a Tool for Sociological Analysis." In *The Social Construction of Technological Systems*, ed. W. E. Bijker, T. P. Hughes and T. J. Pinch. Cambridge, Massachusetts: MIT Press.
- Callon, Michel, Pierre Lascoumes, and Yannick Barthe. 2009. *Acting in an uncertain world: an essay on technical democracy*. Cambridge, MA: MIT Press.
- Camic, Charles, Neil Gross, and Michèle Lamont. 2011. "The Study of Social Knowledge Making." In *Social Knowledge in the Making*, ed. C. Camic, N. Gross and M. Lamont. Chicago: Chicago University Press.
- Carpini, Michael X Delli, Fay Lomax Cook, and Lawrence R Jacobs. 2004. "Public deliberation, discursive participation, and citizen engagement: A review of the empirical literature." *Annu. Rev. Polit. Sci.* 7:315-44.
- Chilvers, Jason. 2008. "Environmental risk, uncertainty, and participation: mapping an emergent epistemic community." *Environment and Planning A* 40 (12):2990 – 3008.
- . 2013. "Reflexive engagement? Actors, learning, and reflexivity in public dialogue on science and technology." *Science Communication* 35 (3):283-310.
- Chilvers, Jason, and Jacquelin Burgess. 2008. "Power relations: the politics of risk and procedure in nuclear waste governance." *Environment and planning. A* 40 (8):1881.
- Coote, Anne, and Jo Lenaghan. 1997. *Citizens' Jury. Theory into Practice*. London: Institute for Public Policy Research.
- Crosby, Ned. 1974. *The educated random sample. A pilot study on a new way to get citizen input into the policy-making process*. Minnesota: The Center for New Democratic Processes.
- . *In Search of the Competent Citizen. A Research Proposal* 1975 [cited. Available from <http://www.jefferson-center.org/vertical/Sites/%7BC73573A1-16DF-4030-99A5-8FCCA2F0BFED%7D/uploads/%7B7E47A111-8AB4-4E75-B298-FF289C442F8B%7D.PDF>].
- Desrosières, Alain. 1998. *The politics of large numbers: a history of statistical reasoning*. Cambridge, MA: Harvard University Press.
- Deuten, J.J. 2003. *Cosmopolitanising technologies. A study of four emerging technological regimes*. Enschede: Twente University Press.
- Dewey, John. 2012 [1954]. *The public and its problems: An essay in political inquiry*. University Park, PA: Penn State Press.

- Dienel, Peter. 1978. *Die Planungszelle. Eine Alternative zur Establishment-Demokratie*. Opladen: Westdeutscher Verlag.
- Dienel, Peter C. 1971. "Wie können die Bürger an Planungsprozessen beteiligt werden? Planwahl und Planungszelle als Beteiligungsverfahren." *Der Bürger im Staat* 21 (3):151-6.
- Disch, Lisa. 2012. "Democratic Representation and the Constituency Paradox." *Perspectives on Politics* 10 (03):599-616.
- Disco, Cornelius, Arie Rip, and Barend van der Meulen. 1992. "Technical innovation and the universities: divisions of labour in cosmopolitan technical regimes." *Social science information* 31 (3):465-507.
- Elliott, Janice, Sara Heesterbeek, Carolyn J. Lukensmeyer, and Nikki Slocum. 2005. *Participatory methods toolkit. A practitioner's manual*. Brussels: King Baudoin Foundation Flemish Institute for Science and Technology Assessment.
- Ezrahi, Yaron. 1990. *The Descent of Icarus: Science and the Transformation of Contemporary Democracy*: Harvard University Press Cambridge, MA.
- . 2012. *Imagined Democracies. Necessary Political Fictions*. Cambridge: Cambridge University Press.
- Felt, Ulrike, and Maximilian Fochler. 2010. "Machineries for Making Publics: Inscribing and Describing Publics in Public Engagement." *Minerva* 48 (3):319-38.
- Freire, Paulo. 2000 [1970]. *Pedagogy of the oppressed*. New York: Continuum International Publishing Group.
- Fung, Archon. 2006. "Varieties of participation in complex governance." *Public Administration Review* 66 (s1):66-75.
- Gastil, John, and William M. Keith. 2005. "A nation that (sometimes) likes to talk: A brief history of public deliberation in the United States." In *The deliberative democracy handbook. Strategies for effective civic engagement in the 21st century*, ed. J. Gastil and P. Levine. San Francisco: Jossey-Bass.
- Geels, Frank, and Jasper J. Deuten. 2006. "Local and global dynamics in technological development: a socio-cognitive perspective on knowledge flows and lessons from reinforced concrete." *Science and public policy* 33 (4):265-75.
- Goldschmidt, Rüdiger, and Ortwin Renn. 2006. *Meeting of Minds – European Citizens' Deliberation on Brain Sciences. Final Report of the External Evaluation*. Stuttgart: DialogikGmbH.
- Gomart, Emilie, and Maarten A. Hajer. 2003. "Is that politics? For an inquiry into forms in contemporary politics." In *Social Studies of Science and Technology: Looking Back, Ahead*, ed. B. Joerges and H. Nowotny. Dordrecht: Kluwer.
- Goodin, Robert E., and John S. Dryzek. 2006. "Deliberative impacts: the macro-political uptake of mini-publics." *Politics & society* 34 (2):219.
- Greenpeace. 2007. *Talking Nonsense – The 2007 Nuclear Consultation*. available online: <http://www.greenpeace.org.uk/files/pdfs/nuclear/2007-consultation-nuclear-dossier.pdf>.
- Guston, David. 2013. "Understanding'Anticipatory Governance'." *Social Studies of Science*:0306312713508669.
- Guston, David H., and Dan Sarewitz. 2002. "Real-time technology assessment." *Technology in Society* 24 (1-2):93-109.
- Habermas, Jürgen. 1981. *Theorie des kommunikativen Handelns. Handlungsrationalität und gesellschaftliche Rationalisierung*. Vol. 1. Frankfurt: Suhrkamp.
- . 1993. *Justification and Application: Remarks on Discourse Ethics*. Cambridge, MA: MIT Press.
- Hacking, Ian. 1983. *Representing and intervening: Introductory topics in the philosophy of natural science*. Cambridge: Cambridge Univ Pr.
- Hendriks, Carolyn M. 2005. "Consensus conferences and planning cells: Lay citizen deliberations." In *The deliberative democracy handbook. Strategies for effective civic engagement in the 21st century*, ed. J. Gastil and P. Levine. San Francisco: Jossey-Bass.
- Hendriks, Carolyn M., and Lyn Carson. 2008. "Can the market help the forum? Negotiating the commercialization of deliberative democracy." *Policy Sciences* 41 (4):293-313.
- Hennen, Leonhard, Thomas Petermann, and Constanze Scherz. 2004. *Partizipative Verfahren der Technikfolgenabschätzung und parlamentarische Politikberatung. Neue Formen der*

- Kommunikation zwischen Wissenschaft, Politik und Öffentlichkeit*. Berlin: Büro für Technikfolgenabschätzung beim deutschen Bundestag (TAB).
- Heurтин, Jean-Philippe. 2005. "The circle of discussion and the semicircle of criticism." In *Making things public: atmospheres of democracy*, ed. B. Latour and P. Weibel. Cambridge: MIT Press.
- Hörning, Georg. 1999. "Citizens' panels as a form of deliberative technology assessment." *Science and public policy* 26 (5):351-9.
- Horst, Maja, and Alan Irwin. 2010. "Nations at Ease with Radical Knowledge: on consensus, consensusing and false consensusness." *Social Studies of Science* 40 (1):105-26.
- Hughes, Thomas P. 1987. "The Evolution of Large Technical Systems." In *The Social Construction of Technological Systems. New Directions in the Sociology and History of Technology*, ed. W. E. Bijker, T. P. Hughes and T. J. Pinch. Cambridge, Massachusetts: MIT Press.
- IFOK. 2003. *Governance of the European Research Area: The Role of Civil Society*. Bensheim: Institut für Organisationskommunikation.
- Irwin, A. 2001. "Constructing the scientific citizen: science and democracy in the biosciences." *Public Understanding of Science* 10 (1):1-18.
- Irwin, Alan. 2008. "STS perspectives on scientific governance." In *The Handbook of Science and Technology Studies. Third Edition*, ed. E. J. Hackett, O. Amsterdamska, M. Lynch and J. Wajcman. Cambridge, MA: MIT Press.
- Joss, S., and J. Durant. 1995. *Public participation in science: the role of consensus conferences in Europe*: Science Museum.
- Karpowitz, Christopher F, and Tali Mendelberg. 2011. "An experimental approach to citizen deliberation." *Cambridge Handbook of Experimental Political Science*:258-72.
- Knorr-Cetina, Karin. 1995. "Laboratory studies: The cultural approach to the study of science." In *Handbook of science and technology studies*, ed. S. Jasanoff and E. al.: Sage Publications, Inc Thousand Oaks, CA.
- Laclau, Ernesto, and Chantal Mouffe. 2001. *Hegemony and socialist strategy: Towards a radical democratic politics*: Verso.
- Latour, Bruno. 1999. *Pandora's hope. Essays on the Reality of Science Studies*. Cambridge, MA: Harvard University Press.
- . 2003. "What if we talked politics a little?" *Contemporary Political Theory* 2 (2):143-64.
- Laurent, B. 2009. "Replicating participatory devices: the consensus conference confronts nanotechnology." *CSI Working Paper Series* 2009 (018).
- Laurent, Brice. 2011a. *Democracies on trial. Assembling nanotechnology and its problems*. PhD Thesis. Paris: Mines Paris Tech, Centre de Sociologie de l'Innovation.
- . 2011b. "Technologies of democracy: Experiments and demonstrations." *Science and Engineering Ethics* 17 (4):649-66.
- Law, John. 2011. "Collateral realities." In *The Politics of Knowledge*, ed. F. D. Rubio and P. Baert. London: Routledge.
- Law, John, and Evelyn Ruppert. 2013. "The social life of methods: Devices." *Journal of Cultural Economy* 6 (3):229-40.
- Levidow, Les. 1998. "Democratizing technology--or technologizing democracy? Regulating agricultural biotechnology in Europe." *Technology in Society* 20 (2):211-26.
- Lezaun, J. 2007. "A market of opinions: the political epistemology of focus groups." *The Sociological Review* 55:130-51.
- Lezaun, J., and L. Soneryd. 2007. "Consulting citizens: technologies of elicitation and the mobility of publics." *Public Understanding of Science* 16 (3):279-97.
- Lövbrand, Eva, Roger Pielke, and Silke Beck. 2011. "A democracy paradox in studies of science and technology." *Science, technology & human values* 36 (4):474-96.
- Maasen, Sabine, and Martina Merz. 2006. *TA Swiss broadens its perspective. Technology assessment with asocial and cultural sciences orientation. Working document of the Centre for Technology Assessment DT-37/2006*. Bern: TA-Swiss.
- Maier, Josephine. 2009. "Nanotechnologie: Warten auf den Störfall." *Die Zeit* 2009 (27).
- Mann, Carsten, and Jan-Peter Voß. forthcoming. "Articulating future scenarios of policy instrument development: enhancing sustainable innovation in governance by opening design processes

- for debate." In *Transdisciplinarity for Sustainability*, ed. M. Padnamabhan. London: Routledge.
- Mann, Carsten, Jan-Peter Voß, Nina Amelung, Arno Simons, Till Runge, and Louisa Grabner. 2013. *Preparatory document for the workshop 'Challenging futures of citizen panels' on 26 April 2013*. Berlin: Technische Universität Berlin.
- . 2014a. *Challenging futures of citizen panels. Critical issues for robust forms of public participation. A report based on interactive, anticipatory assessment of the dynamics of governance instruments, 26 April 2013*. Berlin: Technische Universität Berlin.
- Mann, Carsten, Jan-Peter Voß, Arno Simons, Nina Amelung, Till Runge, and Fabian Schroth. 2014b. *Challenging futures of biodiversity offsetting and trading. Critical issues for robust forms of biodiversity conservation. A report based on interactive, anticipatory assessment of the dynamics of governance instruments, 19 April 2013*. Berlin: Technische Universität Berlin.
- March, James G. 1991. "Exploration and Exploitation in Organizational Learning." *Organization Science*, 71-87.
- Marres, Nortje. 2005. *No Issue, No Public: Democratic Deficits after the Displacement of Politics*. Doctoral dissertation: University of Amsterdam.
- OECD. 2001. *Citizens as partners. OECD handbook on information, consultation and public participation in policy-making*. Paris: OECD.
- Osborne, Thomas, and Nikolas Rose. 1999. "Do the social sciences create phenomena?: The example of public opinion research." *The British Journal of Sociology* 50 (3):367-96.
- Owen, Richard, Phil Macnaghten, and Jack Stilgoe. 2012. "Responsible research and innovation: From science in society to science for society, with society." *Science and public policy* 39 (6):751-60.
- Parkinson, John. 2004. "Why Deliberate? The Encounter Between Deliberation and New Public Managers." *Public Administration* 82 (2):377-95.
- . 2006. *Deliberating in the real world: problems of legitimacy in deliberative democracy*. Oxford University Press.
- Pinch, Trevor J., and Wiebe E. Bijker. 1987. "The social construction of facts and artifacts: or how the sociology of science and the sociology of technology might benefit each other." In *The social construction of technological systems*, ed. W. E. Bijker, T. P. Hughes and T. J. Pinch. Cambridge: MIT Press.
- Porter, T. Michael. 1996. *Trust in numbers: The pursuit of objectivity in science and public life*. Princeton Univ Pr.
- Renn, Ortwin, and Pia-Johanna Schweizer. 2009. "Inclusive risk governance: concepts and application to environmental policy making." *Environmental Policy and Governance* 19 (3):174-85.
- Renn, Ortwin, T. Webler, and P. Wiedemann. 1995. *Fairness and competence in citizen participation: Evaluating models for environmental discourse*. Dordrecht: Kluwer.
- Rip, Arie. 1987. "Controversies as Informal Technology Assessment." *Knowledge: Creation, Diffusion, Utilization*, 349-71.
- Rip, Arie, and René Kemp. 1998. "Technological Change." In *Human Choice and Climate Change*, ed. S. Rayner and E. L. Malone. Columbus, Ohio: Batelle Press.
- Rip, Arie, Thomas J. Misa, and Johan P. Schot. 1995. "Managing Technology in Society. The Approach of Constructive Technology Assessment."
- Rip, Arie, and Johan W. Schot. 2002. "Identifying Loci for Influencing the Dynamics of Technological Development." In *Shaping Technology, Guiding Policy. Concepts, Spaces and Tools*, ed. K. H. Sorensen and R. Williams. Cheltenham: Edward Elgar.
- Rosanvallon, Pierre. 2006. *Democracy past and future*. New York: Columbia Univ Pr.
- Rose, Nikolas S. 1999. *Powers of freedom: reframing political thought*. Cambridge University Press.
- Rowe, Gene, and Lynn J. Frewer. 2000. "Public participation methods: A framework for evaluation." *Science, technology & human values* 25 (1):3-29.
- . 2005. "A typology of public engagement mechanisms." *Science, technology & human values* 30 (2):251-90.
- Schot, Johan, and Arie Rip. 1997. "The past and future of constructive technology assessment." *Technological Forecasting and Social Change* 54 (23):251-68.
- Sebastian, Ureta. forthcoming. "A failed platform: The Consensus Conference travels to Chile." *Public Understanding of Science*.

- Sloterdijk, Peter, and Gesa Mueller von der Haegen. 2005. "Instant Democracy: The Pneumatic Parliament®." In *Making Things Public. Atmospheres of Democracy*, ed. B. Latour and P. Weibel. Cambridge, MA: MIT.
- Smith, Graham, and Corinne Wales. 2002. "Citizens' Juries and Deliberative Democracy." *Political Studies*, 51-65.
- Stewart, John, Elizabeth Kendall, and Anne Coote. 1994. *Citizens' Juries*. London: Institute for Public Policy Research.
- Stirling, Andy. 2008. "'Opening up' and 'closing down' power, participation, and pluralism in the social appraisal of technology." *Science, technology & human values* 33 (2):262-94.
- Sulkin, Tracy, and Adam F Simon. 2001. "Habermas in the lab: A study of deliberation in an experimental setting." *Political Psychology* 22 (4):809-26.
- Van de Ven, Andrew H. 2007. *Engaged Scholarship: A Guide for Organizational and Social Research: A Guide for Organizational and Social Research*. Oxford University Press.
- Van de Ven, Andrew H., Douglas Polley, Raghu Garud, and Sankaran Venkatamaran. 1999. *The Innovation Journey*. Oxford: Oxford University Press.
- Vergne, Antoine. 2010. *Das Modell Planungszelle – Citizens Juries: Diffusion einer politischen Innovation*. unpublished Manuscript.
- Von Schomberg, René. 2012. "Prospects for technology assessment in a framework of responsible research and innovation." In *Technikfolgen abschätzen lehren. Bildungspotenziale transdisziplinärer Methoden*, ed. M. Dusseldorp and R. Beecroft. Wiesbaden: VS Verlag.
- Voß, Jan-Peter, and Nina Amelung. 2013. *The innovation of "citizen panels" as a method of public participation: irony of anti-technocratic expertise and emerging forms of social technology assessment*. Paper presented at the 12th annual meeting of the Science and Democracy Network, June 30th - July 2nd, Harvard University, Cambridge, MA.
- Wakeford, Tom. 2003. *Teach yourself citizen juries. A handbook*.
- Wakeford, Tom, J Singh, B Murtuja, P Bryant, and M Pimbert. 2007. "The jury is out: How far can participatory projects go towards reclaiming democracy?" In *The SAGE Handbook of Action Research: Participative Inquiry and Practice*, ed. P. Reason and H. Bradbury. London.
- Wakeford, Tom, and Jasber Singh. 2008. "Towards empowered participation: stories and reflections." *Participatory Learning and Action* 58 (June):6-10.
- Wynne, Brian. 2006. "Public engagement as a means of restoring public trust in science—hitting the notes, but missing the music?" *Public Health Genomics* 9 (3):211-20.
- . 2007. "Public participation in science and technology: Performing and obscuring a political—conceptual category mistake." *East Asian Science, Technology and Society* 1 (1):99-110.
- Yin, Robert K. 2003. *Case Study Research. Design and Methods*. Thousand Oaks: Sage Publications.