

A Democracy Paradox in Studies of Science and Technology

Eva Lövbrand¹, Roger Pielke, Jr.², and Silke Beck³,

Abstract

Today many scholars seem to agree that citizens should be involved in expert deliberations on science and technology issues. This interest in public deliberation has gained attraction in many practical settings, especially in the European Union, and holds the promise of more legitimate governance of science and technology. In this article, the authors draw on the European Commission's (EC) report "Taking the European Knowledge Society Seriously" to ask how legitimate these efforts to "democratize" scientific expertise really are. While the report borrows from deliberative democrats' normative accounts of legitimacy, the authors identify a tension between the principles for legitimate rule prescribed by deliberative democratic theory and the report's celebration of diversity and dissent. While this inconsistency suggests that the legitimacy of deliberative governance

¹ Centre for Climate Science and Policy Research, Department of Thematic Studies, Linköping University, Norrköping, Sweden

² Center for Science and Technology Policy Research, University of Colorado, Boulder, CO, USA

³ Helmholtz Centre for Environmental Research, UFZ, Leipzig, Germany

Corresponding Author:

Eva Lövbrand, Centre for Climate Science and Policy Research, Department of Thematic Studies, Linköping University, 60174 Norrköping, Sweden

Email: eva.lovbrand@liu.se

arrangements is justified on empirical rather than normative grounds, it remains an open question whether studies of science and technology offer enough empirical support for such a justification. In this article, the authors address this pressing question and propose three possible responses.

Keywords

expertise, democratization, legitimacy, deliberation, studies of science and technology

Introduction

In 2007, the Directorate-General (DG) of Research in the European Commission (EC) published an influential report titled “Taking European Knowledge Society Seriously” (Felt and Wynne 2007). The report was the product of an expert group commissioned by DG Research to assess how to increase the legitimacy of science and technology governance in an age of public mistrust. While the expert group was comprised of a limited number of scholars, their findings resonate with a much broader debate in studies of science and technology. Ever since the Three Mile Island and Chernobyl accidents in the late 1970s and mid-1980s, and more recent food scares such as the bovine spongiform encephalopathy (BSE) crisis and genetically modified organism (GMO) debate in Europe (Irwin 2001; Wilsdon and Willis 2004; Stilgoe, Irwin, and Jones 2006), a growing literature has suggested that scientific expertise is facing a problem of legitimacy. Although science continues to be a critical resource for decision making, many scholars of science and technology today seem to agree that scientific experts need to justify their knowledge claims to much wider communities to regain public trust and legitimacy (Funtowicz and Ravetz 1993; Irwin 1995; Nowotny, Scott, and Gibbons 2002; Fischer 2005; Leach, Scoones, and Wynne. 2007).

In this article, we analyze how these efforts to “democratize” scientific expertise (cf. Kleinman 2001; Liberatore and Funtowicz 2003; Leach, Scoones, and Wynne 2007) are linked to deliberative democratic theory. After political theorists reengaged with deliberative ideals of democracy in the 1990s, democratic legitimacy has increasingly come to be seen as the result of “free and unconstrained deliberation of all about matters of common concern” (Benhabib 1996a, 67). In contrast to aggregative models of democracy that have established voting and representation as the procedures for reaching collective decisions, deliberative democrats emphasize the need to justify collective decisions through an open and reasoned

dialogue among free and equal citizens (cf. Cohen 1996; Bohman 2000; Gutmann and Thompson 2004). Consistent with this deliberative ideal, the authors of the 2007 EC report imagine the reflective citizen as the agent of democratic renewal and authenticity. By engaging in meaningful deliberations with scientific experts, the reflective citizen is thought to bring about a more democratically committed knowledge society (Felt and Wynne 2007, 78). Following this deliberative turn, the first section of this article examines how scholarly justifications for more democratic forms of expertise relate to deliberative democratic theory. Although our analysis is based on a broad review of the literature on studies of science and technology, we use the 2007 EC report as an important reference point to help us navigate this diverse, and far from homogenous, theoretical landscape.

In the second section of this article, we address some of the normative principles for legitimate rule advanced by deliberative democratic theorists. Whereas these principles are central for evaluating the legitimacy of real-life public deliberations, we note that they resonate poorly with the visions articulated in the 2007 EC report. Following social constructivist critique of Enlightenment-type rationalism and universalism, the authors seem to be more concerned with the contextual codes, norms, and values of the deliberating subjects than with standard repertoires of good practice (Felt and Wynne 2007, 60). Although this attention to the dynamic, complex, and contingent nature of deliberative exercises seeks to make explicit the plurality of reasons and the diversity of normative commitments that can guide decisions involving science and technology (Felt and Wynne 2007), we argue that it not only complicates the design and evaluation of face-to-face citizen-science deliberations (cf. Kleinman et al. 2007). It also opens up a more fundamental question of central interest to this article, namely, how legitimate calls for deliberative forms of expertise are in the first place. If scholars of science and technology draw on deliberative democrats' normative account of legitimacy, but reject the principles for legitimate rule prescribed by the same theory, how do we know that deliberative expert practices are more legitimate than those they seek to counter?

In the final section of this article, we address this pressing question. For scholars of science and society to avoid facing what we call a "democracy paradox," we suggest that they need to clarify on what grounds the legitimacy of deliberative expert practices is based. If the normative ideals advanced in deliberative democratic theory are rejected, we argue that scholars in this field may seek to establish the legitimacy of deliberative governance arrangements on empirical grounds. While such a descriptive approach to legitimacy would help to specify the social contexts in which publics

prefer deliberative governance arrangements over more traditional forms of expert practices, it requires that theorists are ready to open up their normative commitments to empirical contestation. Descriptive legitimacy studies offer no normative vantage point for prescribing legitimate rule. Deliberative governance of science and technology will only be legitimate to the extent that its subjects believe it to be so. As long as the empirical support for this claim remains scant, we conclude that scholars of science and society continue to face a democracy paradox. Hence, we end by welcoming a self-reflective debate that clarifies on what grounds the legitimacy of deliberative expertise is based. Without such clarifications, scholars in this field will have trouble make a convincing case for deliberative governance of science and technology.

A Deliberative Turn in Studies of Science and Technology

Citizen involvement in political processes has become a central theme in a diverse set of scholarly fields. Today ample work in the political and policy sciences talks about a shift away from well-established accounts of politics and traditional hierarchical notions of governing to more open-ended and decentralized governance arrangements involving new actors (nongovernmental organizations [NGOs], business, science, and citizens) in new political sites (markets, public-private partnerships, and networks; Rosenau and Czempiel 1992; Hajer and Wagenaar 2003; Bäckstrand et al. 2010). As more participatory modes of governance have gained ground in a vast range of issue areas, so have deliberative ideals of public arguing and reason giving. Gastil and Keith (2005) point to the emergence of a new deliberative democracy movement in liberal democratic societies manifested by participatory experiments such as citizen juries and deliberative polling in the United States, as well as European consensus conferences and stakeholder dialogues.

This mounting interest in deliberative practices can be interpreted as a reaction against the growing distance between the motives and intentions of citizens and the political decisions made in their name (Smith 2003, 54). Since democratic theory took a strong deliberative turn in the 1990s (Dryzek 2000, 1), periodic elections and the principal-agent form of representation in liberal democratic societies are no longer perceived as sufficient to secure democratic control and authenticity. Resting on an aggregative conception of individual preferences, contemporary liberal institutions are thought to render citizenship into a passive and self-interested affair (Dryzek 2000). Against this background, the deliberative model of

democracy has been described as an attempt to reinvigorate public debate and to foster an active notion of citizenship. At the center is the assumption that mere aggregation of individual preferences is not enough to secure the legitimacy of collective decisions. Rather, deliberative democrats insist that the exercise of political authority must be justified to all those who will be bound by it (Gutmann and Thompson 2004). Legitimacy—that is, the acceptability of claims to authority (King 2003, 25)—therefore emerges from a process of collective reasoning by political equals rather than from parliamentary elections or strategic bargaining between opposing perspectives (Benhabib 1996a).

Much of the emerging literature on expert democratization draws on this deliberative conception of legitimacy. Instead of approaching knowledge development as a process distinctly separate from the logic of democracy (Liberatore and Funtowicz 2003, 146), a growing cadre of science and technology scholars is today asking scientific experts justify their knowledge claims to much broader groups than their scientific peers (e.g., Weingart 2008, 139; Jasanoff 2005; Nowotny 2003). In the 2007 EC report, this call for public reason-giving rests on a presumed public uneasiness with science in Western democracies (Felt and Wynne 2007, 31). In a time when the perception, rate, geographical scale, and impacts of modern risk generation have increased significantly, the authors suggest that publics have lost faith in science's ability to offer control and predictability. While the technical risk concept implies calculable probabilities of known consequences, modern mega-risks such as nuclear hazards or anthropogenic climate change have introduced fundamentally new forms of uncertainty that highlight the limits of scientific prediction and the boundaries of existing forms of analytical knowledge (Wynne 1992; Funtowicz and Ravetz 1993). This qualitative change in the ways in which risk is perceived has not only challenged the authority and adequacy of science-based judgments. The widespread uncertainty or even ignorance about the possible consequences of a given form of technological development has also raised questions about the unstated normative assumptions, aspirations, and meanings that drive science and innovation in the first place (Leach, Scoones, and Wynne 2007, 10).

Hence, rather than reducing risk governance to “downstream” uncertainty management by scientific experts, the authors of the 2007 EC report seek to open up risk governance to the diverse “knowledge-abilities” of citizen groups (Felt and Wynne 2007). If citizens are invited to question how experts frame an issue by identifying unexplained assumptions and tacit value choices, they may, it is argued, challenge science-based claims made by social elites and thus repoliticize a technocratic policy discourse

(Fischer 2005; Wynne 2007). In contrast to traditional risk governance that has tended to render citizenship into a passive affair, citizen-science deliberations are thought to foster a vibrant public sphere and reflective citizens willing to engage in a critical dialogue on the future direction of scientific and technological progress (Wynne 2002; Jasanoff 2005). By asking on whose behalf science and technology choices are made, with what rights of representation, and according to whose definition of the common good (Jasanoff 2007, 190), the deliberating citizen is expected to hold scientific experts accountable not only to political practitioners but also to their constituencies—that is, the public (Weingart 2008). While many scholars of science and technology agree with deliberative theorists that such democratic accounting for expertise will foster more legitimate forms of political authority, they have different expectations of the substantive outcomes.

At the heart of the deliberative model of democracy is a commitment to reason as the arbiter of disagreement. When articulating reasons in public, the reflective citizen is forced to move beyond individual preferences and think what counts as good arguments for all others involved (Benhabib 1996a; Cohen 1996). Although far from all deliberative theorists agree that consensus is a necessary or even desirable condition for successful deliberations (cf. Bohman 2000; Young 2003), deliberative democracy offers a general belief that public reason-giving is the best way to uncover what is good and true (Baber and Bartlett 2005, 87). Many scholars of science and technology, by contrast, tend to emphasize the virtue of disagreement and dissensus. Drawing on social constructivist critique of modern universalism, writings on expert democratization often question the very possibility of agreement across different cultures, worldviews, and discourses (Pellizzoni 2001). The ultimate aim of citizen-science deliberations is therefore not to reach the truth, or even agreement, on the common good. More important is to make explicit the plurality of reasons, culturally embedded assumptions and socially contingent knowledge ways that can inform collective action (Jasanoff 2005, 249; Felt and Wynne 2007, 61).

In the following section, we explore what this tension between deliberative democratic theory and studies of science and technology may imply for the evaluation of real-life citizen-science deliberations.

Evaluating the Legitimacy of Citizen-Science Deliberations

While calls for changed expert practices maintain, for the most part, a theoretical rather than practical focus, a growing scholarship has in recent

years set out to make practical sense of the promise of citizen-science deliberations. Table 1 offers a snapshot of some of the many public engagement mechanisms that have become subject to empirical analysis by science and technology scholars. While far from all of these exercises are informed by deliberative democratic ideals, they epitomize the call for public dialogue captured in the 2007 EC report. Despite the recent proliferation of public engagement mechanisms in academic and practical settings, different scholars have noted (Kleinman et al. 2007; Powell and Colin 2009) that the science and technology studies literature still offers little guidance on institutional design. Important procedural matters such as how to select and prepare participants and how to evaluate the quality of public engagement exercises are to date not systematically assessed in the literature on expert democratization. Neither are substantive matters such as how to evaluate legitimate outcomes (Rowe and Frewer 2004).

The following sections provide a brief overview of three procedural principles of importance to the deliberative conception of legitimacy; (1) reciprocity and publicity, (2) accountability, and (3) reason. While each principle is central for the evaluation of deliberative governance arrangements, we note that they resonate poorly with the literature on expert democratization represented by the 2007 EC report.

Reciprocity and Publicity

The deliberative principle of reciprocity refers to fair terms of political reasoning and holds that citizens owe one another justifications for the decisions they collectively make (Gutmann and Thompson 1996). As explained by Hicks (2002, 226), the deliberative conception of legitimacy requires that all those subject to a decision have equal chance to express their wishes, desires, and feelings, and to introduce questions and counter arguments. In contrast to strategic bargaining and manipulation, such dialogue should be unconstrained; that is, free from coercion and deception and oriented toward broadening the understanding and perspectives of the participants (Smith 2003, 58; Dryzek 2000). The principle of publicity in turn suggests that the reasons citizens give to justify political actions, and the information necessary to access those reasons, should be comprehensible and accessible (Gutmann and Thompson 1996, 95). Through critical argument that is open to the point of view of others, the deliberating citizen should aim for reasons that are freely acceptable by all those involved (Young 2003, 104).

The literature on expert democratization often invokes these procedural ideals. In the spirit of reciprocity and publicity, many scholars of science

Table I. Snapshot of Some Reoccurring Public Engagement Mechanisms

Mechanism	Objective	Function	Reference
Citizen jury	Produce publicly grounded and deliberated policy recommendations	Single jury of 12-20 random citizens meets over four to five days to hear expert witnesses on the policy issue at stake. After final deliberations, the jury presents recommendations to decision-makers and public	Crosby and Nethercut (2005)
Consensus conference	Bring citizens and experts together to discuss science and technology issues. Provide policy recommendations	Panel of 12-24 random citizens meet over eight days. First stage: citizens receive information on the issue at stake and formulate questions. Second stage: citizen's question experts, deliberate, and present final report to the media and public	Guston (1999); Nishizawa (2005); Kleinman et al. (2007)
Deliberative mapping	Combine scientific risk assessment with public deliberation	Citizen panel of 8-10 members differentiated by gender and socioeconomic class deliberates in six evening meetings to appraise technology options. The panels meet with experts in a joint workshop	Davies and Burgess (2004); Burgess et al. (2007)
Science shop	Produce research that is useful to civic groups	A deliberative arrangement for local community groups and university researchers. Channels civic knowledge demands to researchers who incorporate them into their research agendas	Irwin (1995)

and technology hope that the deliberating citizen will open up science and technology governance to public debate, expose different arguments, and interrogate underlying assumptions and meanings (Wilsdon and Willis 2004, 40; Stirling 2008). Ideal deliberative arrangements are therefore those that promote mutual respect for different ways of reasoning and give civic participants opportunity and time to reflect on the prior questions that drive the “upstream” processes of research and innovation (Wynne 2007, 80). Despite the democratic promise of such deliberative arrangements, scholars of science and technology are often weary of institutional realities. Just as public engagement exercises can open up science and technology governance to meaningful public debate, deliberative practices are vulnerable to nondeliberative behavior, strategic action, and elite opinions (Button and Ryfe 2005, 22). The choices made by facilitators and sponsors in the design and implementation of the exercise are often highlighted in this context (Powell and Colin 2009).

Since deliberative mechanisms rely on structured interactions between citizens and experts, Block (2007) notes that they by design constrain the communication. In some cases, the organizers’ institutional affiliation restricts the deliberative space of the exercise. Drawing on the experiences of a Japanese consensus conference on GMO crops, Nishizawa (2005) has, for instance, shown how seemingly reciprocal deliberations can be distorted by the unspoken expectations of government organizers and industry sponsors. In other cases, the time and resources allotted to the exercise are too limited for a thorough preparation of the lay participants and a meaningful interaction with the expert panel (Kleinman et al. 2007). Instead of giving voice to different perspectives and alternative ways of reasoning, such deliberations typically downplay divergent interpretations in favor of unitary and prescriptive policy advice (Stirling 2008, 279). Although the literature also contains more positive examples (see, for instance, Marris, Pierre-Benoit, and Rip 2008), critics have suggested that these distortions are endemic to public deliberations and stem from deliberative democrats’ simplistic understanding of politics and power (Mouffe 1999; Young 2003). Nonetheless, most deliberative theorists hold on to reciprocity and publicity as normative ideals against which the performance of institutional practice can be evaluated.

In some parts of the science and technology studies community, however, the practical challenges of “doing” expert democratization have resulted in a weariness of institutional arrangements that downplay ambiguities, difference, and dissent (Wynne 2007; Stirling 2008). To avoid imposing framings that fail to challenge entrenched assumptions and

imaginings, there are to date few guidelines for deliberative practices in this field. Despite calls for clarified methods, technical toolkits and standardized evaluation criteria (Kleinman et al. 2007, 167; Rowe, Marsh, and Frewer 2004), many theorists ask practitioners to adopt a flexible and situationally appropriate approach to their activities (Irwin 2001, 16; Felt and Wynne 2007).

Accountability

Accountability is another procedural principle that has gained resonance in the literature on expert democratization. In the ideal deliberative forum, all participants are accountable to each other. In the spirit of reciprocity, participants advance reasons that are acceptable to those bound by the resulting decision (Gutmann and Thompson 1996, 129). Scholars of science and technology have sought to extend this deliberative principle of accountability beyond expert institutions where decisions on science and technology are made and thus hold experts accountable to the discursively determined ends of the people at large (Parkinson 2003, 183). Many have noted that this expansive ideal of inclusion is vulnerable to demolition of its own legitimacy claims (Dryzek 2001, 651; Hicks 2002). Since deliberated outcomes are legitimate only to the extent that they receive reflective assent by *all* those subject to the decisions in question (Benhabib 1996a), the deliberative principle of accountability raises a fundamental problem of scale.

As noted by Abelson et al. (2003, 245), deliberative exercises that provide opportunities for meaningful involvement by civic participants are, by design, exclusive. To realize the procedural criteria for reciprocal and public dialogue, they can only involve a small group of citizens. While such processes indeed may foster free and equal reason-giving among the participants, the legitimacy of the outcomes can still be questioned by the broader community asked to live under them. Parkinson (2003) points to the paradoxical nature of this problem of scale in deliberative democracy. “(D)eliberative decisions appear to be illegitimate for those left outside the forum, while bringing more than a few in would quickly turn the event into speech-making, not deliberation” (Parkinson 2003, 181). Deliberative theorists have responded to this critique by asking those who participate in public deliberations to act as political trustees and search for meaningful ways of representing the perspectives of those who cannot (Eckersley 2004, 114; Dryzek 2001), ironically, representing a step toward the aggregative model of politics that deliberative democrats have critiqued. Scholars

attuned to the politics of difference have, however, questioned the notion that anyone can stand in for anyone else and represent the diversity of sociocultural identities and rationalities in complex societies. As argued by Phillips (1996, 149), representation runs the risk of downplaying difference and imposing a misleading sense of uniformity. This risk is of central concern to many scholars of science and technology.

Evaluating a deliberative conference on radiological safety, Rowe, Marsh, and Frewer (2004) point at the difficulty and yet importance of involving all those with a stake in the resulting decisions. Without a wide representation of public concerns, meanings, and worldviews, the exercise runs the risk of reifying dominant assumptions and thus eroding its claims to legitimacy among those who were not invited. Expert representation is another factor that affects the accountability of citizen-science deliberations. Drawing on the first U.S. consensus conference on telecommunications, Sclove (2001, 43) notes that a restricted sample of expert opinions reduces the likelihood of a nuanced and reflective discussion among lay participants. Instead of highlighting ambiguities between different disciplinary perspectives and making explicit ignored uncertainties, poor representation of expert opinions restricts the scope of the debate. While the scholars of science and technology represented by the 2007 EC report hold on to an expansive ideal of inclusion in the name of diversity, it is important to note that the endless search for sufficiently pluralized categories offers little guidance to practitioners. Even if we give the demand for free and equal access a more moderate formulation, Knight and Johnson (1994) note that the appearance of new and hitherto unheard constituencies will subvert any practical attempt to institutionalize the deliberative principle of accountability.

Reason

For deliberative democrats, public reason constitutes a critical standard for political justification. Public reason is anchored in a principle of impartiality and the ability of the deliberating subjects to transcend their personal preferences and points of view in favor of reasons that appeal to “the common good” (Cohen 1996). Cohen (1989, 25) has defined the common good as those interests, aims, and ideals that survive free and reasoned assessment of alternatives by equals. Hence, by confronting their own ethical insights and preferences in the light of conflicting perspectives and other ways of reasoning, deliberating citizens are expected to sort out good reasons from bad, valid arguments from invalid. Some deliberative democrats

would go as far as to suggest that the aim of the exercise is to single out one impartial argument that can be proved valid in the same way as a statement of fact. The core idea is that only one true response to a problem exists. While there may be many private reasons, there is only one public reason (Hicks 2002). The better argument is consequently the one that analyses a problem most thoroughly and indicates the optimal solution in terms of technical excellence and moral rightness (Pellizzoni 2001, 62).

Whereas this appeal to universal validity serves as a cognitive standard for evaluating the quality of deliberated outcomes, it marks a fundamental dividing line between deliberative democratic theory and studies of science and technology. At the core of the constructivist theory of democratic expertise is a general mistrust in universal solutions. By studying how claims to epistemic validity come into being and are sustained across cultural and political contexts, many scholars of science and technology have questioned the notion that all publics reason in the same fashion or from the same epistemological foundations (cf. Jasanoff 2005). From this vantage point, consensus on the common good is neither attainable, nor desirable. Lacking a shared understanding of the meanings of principles and concepts, diverse publics cannot be expected to reach agreement on what is good and true. However, instead of approaching disagreement as sign of failure or a division that reason should transcend, the authors of the 2007 EC report describe it as a resource that will keep public engagement with science alive (Felt and Wynne 2007, 61). Rather than aiming for a final consensus, the very purpose of opening up expert judgments to public scrutiny is to make explicit the divergences of perspectives (Stirling 2008, 282).

While this celebration of plurality and dissent allows studies of science and technology to circumvent some of the critique directed against deliberative models of democracy (see, for instance, Mouffe 1999; Young 1996), it offers little practical guidance on how to reach closure in real-life deliberations. If we do not accept reasoned consensus as the final decision rule for citizen-driven engagement with specialists, there is no obvious end point to the discursive process. Although scholars may aim for a continuous reexamination of the culturally embedded assumptions guiding science and technology governance, real-life experiences of public engagement exercises remind us that there are temporal and practical limitations to debate (see Abelson et al. 2003; Burgess et al. 2007). If citizen-science deliberations are to have a real impact on policy decisions, the discursive process must at some point be closed down and brought to an end in the form of commitments to action.

How Legitimate are Calls for Deliberative Forms of Expertise?

As described above, deliberative democratic theory expresses a set of procedural principles that prescribe legitimate forms of collective action. This prescriptive approach to legitimacy does not ask whether or why people accept deliberative governance in reality. Rather, legitimacy is a normative quality attributed by political theorists to a particular form of rule (Steffek 2003, 253). Following the 2007 EC report, we have found that a growing cadre of science and technology scholars draws on the deliberative conception of legitimacy. To restore public trust in science and technology governance, expert institutions are today asked to justify their knowledge claims in public and to listen to the views and concerns of all those affected by science and technology decisions. Only when the ivory tower is opened up and citizens are given meaningful opportunities to scrutinize how matters of risk are framed and validated, is it possible to develop a socially robust knowledge society (Liberatore and Funtowicz 2003; Felt and Wynne 2007).

Despite these close ties to the deliberative democratic theory, our study suggests that many scholars of science and technology are uneasy with deliberative democrats' efforts to prescribe objective principles by which deliberative encounters should be structured and evaluated. This uneasiness is manifested in the 2007 EC report. Resting on a long-standing scholarly ambition to challenge conventional understandings and promote diversified imaginations for science and technology governance, the report rejects singular models, best practices, and institutional fixes. In the name of diversity and dissent, practitioners are instead asked to be attentive to different logics of participation and the "software" (informal codes, values, and norms) that governs scientific and policy practices (Felt and Wynne 2007, 60; Stirling 2008, 282). Whereas this institutional flexibility is thought to embrace the messy, dynamic, and contextual nature of deliberative encounters, we argue that it runs the risk of eroding its own claims to legitimacy. Without a clear standard against which legitimate expert practices can be evaluated, scholars of science and society fail to justify why deliberative governance of science and technology deserves primacy over other approaches to decision making. Since this inconsistency is deeply paradoxical and runs the risk of undermining continued efforts to link science to democratic politics, we hereby suggest three possible ways forward for scholars in this field.

Strengthening Links to Deliberative Democratic Theory

The first, and most immediate, response to our concern would be to clarify how calls for expert democratization are linked to deliberative democrats' prescriptive accounts of legitimacy. Although the concept and ideal of public deliberation has gained widespread resonance in the science and society literature, few scholars in this field have to date specified how their normative visions of public engagement with science relate to the deliberative ideals advanced in democratic theory. If scholars of science and technology want to draw on such ideals, we suggest that they also need to engage more seriously with the moral principles for legitimate rule central to deliberative models of democracy. Although reciprocity, publicity, accountability, and reason only represent a sample of the many procedures and standards of conduct debated among deliberative democrats, these principles exemplify the prior conditions that must be met before governance by citizen deliberation can be determined legitimate. Engagement with these principles would not only ground debates on expert democratization in a distinct theory of the citizen and specify ideal forms of political relationships. It would also force scholars in this field to make explicit the normative standard against which citizen-science deliberations can be designed and evaluated and thus help to move the debate on expert democratization into a more operational mode.

As noted by Dryzek (2007, 237), normative political theory is sometimes characterized as being an evidence-free zone. Concerned with a democratic ideal, from which real-world practices and possibilities can diverge to a lesser or greater degree, deliberative theorists have traditionally paid less attention to empirical evidence. The ongoing experimentation with public engagement exercises in science and technology studies could help counter this problem. Just as deliberative democrats have been asked to take a dynamic view of their theory and revise its principles in the light of new moral insights and empirical discoveries (Gutmann and Thompson 2004, 57), the current engagement with practice allows scholars of science and technology to test how their normative principles play out in real-life settings. Taking deliberative ideals seriously means that theory can and should not be insulated in relatively closed academic circles. A documented mismatch between theory and practice may not simply mean that practice has not lived up to the theoretical ideals but perhaps that the theory demands too much of the real world.

Hence, rather than interpreting institutional failures as distortions from the theoretical ideal, engagement with practice draws attention to possible tensions in the ideal itself. To open up the theory of democratic expertise to

the concerns and perspectives of those who design and participate in real-life citizen-science deliberations is, from this vantage point, not only a matter of principle and consistency. It would also help scholars of science and technology to address matters of institutional design and hereby establish closer links between ideal theory and policy practice.

Putting Deliberative Expertise through the Test of Deliberation

An alternative response to our concern would be to detach the literature on expert democratization from the philosophical legacy of deliberative democracy altogether. Rather than offering normative justifications for deliberative encounters between specialists and citizens, scholars of science and technology could instead continue to offer detailed accounts of the messy and socially embedded encounters in which social actors negotiate the credibility and legitimacy of expertise in practice (Davies and Burgess 2004, 352). Such an approach would allow scholars in this field to enrich the understanding of how discourses and practices of legitimacy are socially constituted and contested across time and contexts and thus avoid prescribing standard repertoires of good practice (Felt and Wynne 2007). Descriptive or sociological legitimacy studies of this kind would, however, ask scholars of science and technology to be ready to open up their normative commitments to empirical contestation. Lacking an objective morality or truth, descriptive studies cannot prescribe legitimacy (Bernstein 2005, 156). Deliberative governance of science and technology is only legitimate to the extent that its subjects believe it to be so. Hence, scholars advocating deliberative governance arrangements would, from this vantage point, need to put their own normative commitments through the test of public deliberation.

The results of such an empirically open exercise are difficult to foresee and may, as implied by Hagendijk and Irwin (2006), develop in unexpected ways. Our brief literature review does, however, tell us that publics may not automatically embrace the virtues of deliberative arrangements. Drawing on experiences from the health sector Abelson et al. (2003, 248), for instance, note that citizens often are unwilling to participate in time-consuming public engagement exercises, if they cannot be assured that their involvement will make a difference. A similar finding is offered by Guston (1999) in his study of the first U.S. consensus conference on telecommunications. Public opinion polls point in the same direction. Whereas European publics in some instances call for increased citizen involvement in decisions about science and technology (Eurobarometer 2005a, 98),

polling data indicate that only a small minority of the European citizenry is willing to participate in facilitated citizen-science deliberations (Eurobarometer 2007, 38). In Europe and United States alike the public appears to think, generally, that scientific experts offer credible inputs to public policy issues and that they are the actors best suited to make decisions about science and technology (Eurobarometer 2005a, 89; Eurobarometer 2005b, 39; National Science Board [NSB] 2008).

Although the authors of the 2007 EC report tell us to challenge the images of public indifference and passivity produced by these large-scale surveys (Felt and Wynne 2007, 58), a descriptive approach to legitimacy offers no normative grounding for an alternative imagery. Hence, scholars who choose this response to our democracy paradox either need to offer empirical results that challenge the validity of this polling data or accept that deliberative governance of science and technology may not be as legitimate in practice as assumed in theory. As unsatisfactory as the latter result may seem, it is a logical consequence of a descriptive approach that calls for self-reflection. If empirical studies do not offer convincing evidence that public prefer deliberative governance arrangements over other forms of decision making, contemporary calls for expert democratization rest on instable grounds. Evans and Collins (2008, 615) have argued that all experts run the risk of becoming blinkered by one's own outlook. As experts on expertise, scholars committed to the democratization of science and technology governance should be particularly sensitive to such a risk and be eager to put their own normative commitments through the test of deliberation. Only when adhering to internally consistent criteria of legitimacy, can scholars of science and society make a convincing case for deliberative governance of science and technology.

Exploring Alternative Models of Democracy

The third, and still most unexplored, response to our concern would be to examine how the legitimacy of expertise plays out under different conceptions of democracy. To date a range of democratic theorists have, for instance, explored how various forms of difference—ethnic, religious, linguistic, and cultural—can be reconciled with liberal ideals of democracy (see, for instance, Benhabib 1996b). Embedded in a philosophical critique of Enlightenment-type rationalism, essentialism, and universalism, and a call for acknowledging experiences of otherness, dissonance and resistance, such “democratic politics of difference” seems to resonate better with the social constructivist research tradition in science and technology studies

than do deliberative ideals of democracy. The extent to which these theoretical explorations into identify and difference challenge or offer alternatives to the institutions and culture of liberal democracies vary. However, in either case, they point at the diversity of perspectives that future efforts to link science to democratic politics could draw inspiration from. Hence, we argue that more thorough studies of what the democratization of expertise could imply under alternative conceptions of legitimacy offer fertile ground for future studies of science and technology.

Conclusion

In this article, we have argued that studies of science and technology have taken a deliberative turn in recent decades. Following the ground paved by the report “Taking European Knowledge Society Seriously,” published by the EC in 2007, we have found a growing commitment to deliberative forms of expertise that open up the governance of science and technology to a plurality of voices and framing conditions (Stirling 2008, 279; Felt and Wynne 2007). We have demonstrated that this rethinking of expertise advances a conception of legitimacy closely related to deliberative democratic theory. Rather than building the legitimacy of science and technology governance solely on the authority of advice from a closed cadre of experts, scholars of science and technology today ask scientific experts to justify their knowledge claims in view of alternative ways of reasoning and knowing. The legitimacy of technoscientific decisions thus derives from a process of public deliberation that grants citizens an active role in the sense making and governance of science and technology (Maasen and Weingart 2005).

While many scholars of science and society share deliberative democrats’ optimistic view of the citizen as the agent of democratic renewal and authenticity, this article has drawn attention to an inconsistency between the deliberative principles for legitimate rule and the calls for diversity and dissent articulated in the 2007 EC report. Following a social constructivist research tradition, an important strand of thought in science and technology studies seems uneasy with deliberative democrats’ efforts to prescribe objective principles by which deliberative encounters should be structured and evaluated. Since this inconsistency questions deliberative democracy as the normative ground for the contemporary rethinking of expertise, we have urged scholars of science and society to reflect on and specify what grounds the legitimacy of deliberative governance arrangements are based. Without

such specifications, how can we know that deliberative expert practices are more legitimate than those they seek to counter?

We do not exclude the possibility that our call results in stronger links between deliberative democratic theory and studies of science and technology. If future empirical studies give support to current polling data and maintain that citizens are unwilling to participate in time-consuming public engagement exercises, scholars committed to deliberative forms of expertise may have no other choice than to accept the prescriptive legacy of deliberative democracy. Indeed, since deliberation is supposed to transform citizen preferences (including preferences about politics), calls for deliberation are not automatically contradicted by public opposition to deliberation. In this respect, the paradox we identify represents a basic dilemma in democratic politics: democratic institutions have to generate the same public attitudes on which they rely. This is why democratic theorists go beyond simply advocating deliberation and call for policies that establish the economic, cultural, and institutional preconditions of deliberation (Brown 2009).

Whether scholars of science and technology find this response to our democracy paradox compelling, or if they decide to explore alternative conceptions of legitimate rule, remains to be seen. In either case, our argument remains the same. Only when specifying and adhering to internally consistent criteria of legitimacy, will students of science and technology be able to make a convincing case for more deliberative governance of science and technology.

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Bios

Eva Lövbrand works as Assistant Professor at the Centre for Climate Science and Policy Research at Linköping University in Sweden. Eva's research interests revolve around the role of science and expertise in global environmental governance in general, and climate governance in particular.

Roger Pielke, Jr. is a professor of environmental studies at the University of Colorado where he is also a Fellow of the University's Cooperative Institute for Research in the Environmental Sciences. Roger, trained in mathematics and political science, studies various aspects of science in society.

Silke Beck is a senior research scientist at the Helmholtz Centre for Environmental Research-UFZ in Germany. Silke's areas of research are global environmental assessment, science and public policy, science and technology studies, comparative policy analysis, and environmental governance.