The Importance of Participatory Virtues in the Future of Environmental Education

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Abstract Participatory approaches to environmental decision making and assessment continue to grow in academic and policy circles. Improving how we understand the structure of deliberative activities is especially important for addressing problems in natural resources, climate change, and food systems that have wicked dimensions, such as deep value disagreements, high degrees of uncertainty, catastrophic risks, and high costs associated with errors. Yet getting the structure right is not the only important task at hand. Indeed, participatory activities can break down and fail to achieve their specific goals when some of the deliberators lack what we will call *participatory virtues*. We will argue for the importance of future research on how environmental education can incorporate participatory virtues to equip future citizens with the virtues they will need to deliberate about wicked, environmental problems. What is the role of education for deliberative skills and virtues relative to other aspects of environmental education, such as facts and values education? How important is it relative to careful design of the deliberative process? What virtues really matter?

Keywords Environmental virtue · Deliberative virtues · Intellectual virtues · Wicked problems · Environmental education · Environmental values · Deliberative democracy · Environmental ethics education · Environmental politics · What virtues really matter

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Introduction

Public participation approaches to environmental problems—from community-based environmental monitoring of dioxin levels to science cafes on the environmental health risks of nanotechnology—continue to grow in many academic and policy circles (Kleinman 2000; Stern and Fineberg 1996; Brown 1997; Fischer 2000; Shrader-Frechette 2002, 2007; Dietz and Stern 2008; Karinen and Guston 2010; Baber and Bartlett 2005). One principle behind them is that a "purely technocratic orientation is incompatible with democratic ideals" (Fiorino 1990, p. 239). Technocratic orientations to environmental policy-making are also associated with public distrust of science (Whyte and Crease 2010; Wynne 1996), narrow conceptions of risk (Shrader-Frechette 1991; Cranor 2009), and harmful "unforeseen" accidents (Jasanoff 2006). Much of the literature just cited explores ways of structuring deliberative activities that inform and empower ordinary people and facilitate collective learning by participants with different viewpoints, knowledges, and circumstances.

Improving how we understand the structure of deliberative activities is especially important for addressing problems in natural resources, climate change, and food systems that have wicked dimensions, such as deep value disagreements, high degrees of uncertainty, catastrophic risks, and high costs associated with errors (Brown et al. 2010; Batie 2008; Lach et al. 2005; Kreuter et al. 2004; van Bueren et al. 2003; Korhonen and Seager 2008; Norton 2005; Ulrich 2003). Yet getting the structure right is not the only important task at hand. Indeed, participatory activities can break down and fail to achieve their specific goals when some of the deliberators lack what we will call *participatory virtues*. We will argue for the importance of future research on how environmental education can incorporate participatory virtues to equip future citizens with the virtues they will need to deliberate about wicked, environmental problems.

Public Participation and Wicked Problems

We begin by outlining why public participation is increasingly important for wicked problems. Public participation generally refers to processes sponsored and organized by a government agency, NGO, institute of higher education, or other organization for the purpose of engaging the public in one or more aspects of a public decision (Dietz and Stern 2008, p. 11). These processes include deliberative activities like citizen juries, public hearings, expert fora, and public meetings, among many others (Abelson et al. 2001). We also use the term broadly to include engagement with members of the public at large (e.g., a national consensus conference on climate change) as well as more local engagements with the stakeholders of environmental decisions and problems (e.g., public meetings for permitting processes).

The degree to which deliberative activities are meaningful to the participants varies. Public hearings, for example, are usually considered to be deliberative in a weak sense because there are few opportunities for dialogue and information sharing among the participants. Citizen juries may be more deliberative since

citizens are able to examine experts with their own questions. In this article, public participation also refers to participatory action research, participatory rural appraisal, participatory extension approaches, and the like (Whyte 1991; McTaggart 1997; Hagmann et al. 1999; Castellanet and Jordan 2002; McIntyre 2008). These forms of participation often include many deliberative activities used for setting goals, organizing the research and collaboration, and interpreting and disseminating the results and outcomes.

Environmental problems like climate change, natural resources management, and food systems development are often considered to be wicked. The term wicked is used to characterize problems in complex social systems that are "are ill-formulated," involve uncertainty and confusing information, have many decision-makers and affected parties with different and "conflicting values," and promise "ramifications for the whole system" that "are thoroughly confusing" (Churchman 1967, p. B-141). The ten, well-rehearsed wicked aspects outlined by Rittel and Webber (1973) are that there are no (1) definitive problem formulations shared by all parties, (2) stopping rules, (3) true or false solutions (only good or bad; better or worse), (4) immediate or ultimate tests of proposed solutions, (5) insignificant opportunities to learn by trial-and-error, (6) sets of potential solutions or well-described sets of permissible operations that may be incorporated into the plan. In addition, (7) every wicked problem is essentially unique, (8) can be considered to be a symptom of another problem (i.e., wicked problems cannot be isolated from other problems), and (9) admits of discrepancies that can be explained in numerous ways. Finally, (10) the planner has no right to be wrong (i.e., publics and stakeholders are unforgiving of errors).

There are some good reasons why participatory approaches are needed to address environmental problems with the wicked dimensions just outlined. First, experts are not separable from their own peculiar interests nor occupy some elevated, apolitical ground from which they can give value- and interest-free advice (Rittel and Webber 1973, p. 169). Second, because problem formulation in wicked problems is subjective, no one stakeholder's (experts included) formulation of the problem is prima facie privileged (Rittel 1972). Finally, because there is no accepted or relevant expertise for approaching the entire problem, most stakeholders have epistemic authority over certain aspects, from science credentials to knowledge of local conditions and practices to understanding of value judgments, frames, and community preferences (Douglas 2005).

Recently theoretical research has blossomed on how to structure public participation activities in ways that address wickedness (Brown et al. 2010; Batie 2008; Lach et al. 2005; Kreuter et al. 2004; van Bueren et al. 2003; Korhonen and Seager 2008; Ulrich 2003). By *structure*, we mean the organizational and facilitation methods of actual events. Brown (2010), for example, uses an approach influenced by Kolb (1984) in which the structure of activities involves cyclical deliberations around a diverse group of learners, opportunities for their reflections on concrete experiences related to the problem and for the creation of ideas from the reflections, and testing of the concepts among participants before using them to guide actions. This approach aims for cooperative learning that harnesses the importance of each participant's perspective.

There is also the large literature over the last 20 years of how to structure public participation activities in environmental decision-making, some of which is relevant to addressing environmental problems with wicked dimensions (See Webler and Tuler 2006, 2002; Fung 2006; Chess and Purcell 1999; Davies 2001; Kasemir et al. 2003; Rowe and Frewer 2005). This point has been made with some of the participatory approaches in this literature. For example, the Vroom-Yetton structure (Vroom and Jago 1978) has been adapted from management theory to natural resource decision making (Daniels et al. 1996; Thomas 1990). Vroom-Yetton is a decision tree that helps decision-makers determine what engagement structures are appropriate depending on the features of the problems they face. Another example is the procedural justice approach in which correct information, representativeness, and bias suppression mechanisms are structured into the activities (Webler and Tuler 2002).

This research is rather promising for getting closer to a world where we can cope better with wicked, environmental problems. Yet is getting the structure right the only avenue worth pursuing with respect to public participation and wicked problems? In the next section, we claim that a significant reason why deliberative activities break down or fail to achieve their specific goals is that participants lack certain virtues that are particularly relevant to working and collaborating with others under wicked conditions.

Deliberative Activities and Virtues

Deliberations can sour even in the best well structured forums if participants themselves are not prepared to participate in them meaningfully. Structural adaptations and mechanisms can perhaps mitigate to an extent the damaging effects of combativeness, inattentiveness, dishonesty, etc., in participants. Still, presumably things go better if participants are reasonable, engaged, and sincere. We discuss briefly two cases with wicked dimensions that illustrate this point.

The State of the Lake Ecosystem Conference (SOLEC) is held every two years and is sponsored by the United State EPA and Environment Canada. As described by the U.S. Environmental Protection Agency (EPA), the State of the Lake Ecosystem Conferences,

> are intended to provide a forum for exchange of information on the ecological condition of the Great Lakes and surrounding lands. A major purpose of this is to reach a large audience of people in the government (at all levels), corporate and not-for-profit sectors who make decisions that affect the lakes. Other conferences and fora are expected to meet the need for exchange of research results and for large gatherings of the general public. (EPA, http://www.epa.gov/solec/)

Here, information exchange is the goal of the conference activities. Prior to the 2000 meeting of the conference, one of the structural problems was that few members of First Nations and Tribes in the U.S. and Canada "had any prior dealings or involvement with the SOLEC process" (McGregor 2008, p. 143). This is

surprising given the stake local Aboriginals have in the condition of the Great Lakes, but also given the distinctive knowledge, commonly called Traditional Ecological Knowledge (TEK), they have collectively accumulated over thousands of years inhabiting the Great Lakes region.

The 2000 meeting of SOLEC specifically aimed to correct this structural oversight. Six Aboriginal environmental professionals, together with a Native elder, participated throughout the conference. The conference also featured workshops and plenary sessions devoted to integrating TEK into SOLEC initiatives. But the process has not apparently succeeded nor been an easy one. Based on observations from Native environmental professionals, McGregor reports a number of problems: ongoing underrepresentation of the diversity of First Nations, the absence of many actual TEK holders among Natives participants, and a lack of trust between Tribal elders and government actors. McGregor also reports that

> Responses to the, albeit limited, Native presence at SOLEC 2000 was felt by participants to be less than welcoming. During workshops presented by non-Native researchers, environmental agency staff seemed unaware of the potential value of Aboriginal contributions to the process. Non-native researchers appeared too ready to dismiss Native concerns raised, and seemed to have little experience working with Aboriginal people. Non-native presenters seemed to assume sole ownership of specific aspects of the SOLEC process such as indicator selection, and sometimes became defensive when challenging questions were raised by Native participants. The Native participants agreed that little can be accomplished until a greater respect is afforded TEK and Aboriginal input (McGregor 2008, p. 148).

The conduct of non-native researchers could be attributed to simple ignorance of TEK and their limited experience working with Aboriginal people. Indeed McGregor recommends cultural sensitivity training for non-native participants as a partial solution to the problem (153). But defensiveness and a territorial possessiveness of a process are common deliberative vices even among those from the same social group. In deliberative processes involving multiple social groups, participants must in any case be prepared to work amicably with those who are unfamiliar. To that extent non-native participants of the 2000 SOLEC conference seem to have lacked what Aikin and Clanton have called "group-deliberative virtues," including deliberative friendliness and humility (Aikin and Clanton 2010). Without these virtues, deliberative processes can fail to be sufficiently inclusive even when some of the relevant stakeholders are present and involved.

While disappointing, SOLEC's inclusiveness problems are perhaps not surprising. A long history of mistrust accompanies non-native and Aboriginal participants into the process. But inclusiveness seems to be a participatory character problem even among citizens of the same social group. This is illustrated in Maria Powell and Mathilde Colin's research initiative building a coalition of Madison, Wisconsin area citizens to engage in critical deliberation about future impacts and risks of nanotechnology (the Citizens Coalition on Nanotechnology or CCoN). Powell and Colin report, for instance, that citizen leaders of CCoN

sometimes neglected to include everyone in e-mail communications that were pertinent to the whole group and did not seem to understand that inclusive communication is the key in effective democratic processes and in building a strong group. Issues related to clear and inclusive communications became frequent and often thorny and confusing topics at weekly meetings (2009, p. 334).

In fact the momentum of the coalition fizzled when, at "a sparsely attended meeting and without prior notification," one citizen leader proposed to dissolve the coalition and form a new one independent of Powell and Colin's participation (2009, p. 338). While other citizen leaders of CCoN rejected this plan and CCoN continues to meet, Powell and Colin report that group participation has since been low and the organization has no major public outreach activities planned.

Apart from these problems of inclusiveness, Powell and Colin (2009, p. 334) also report high rates of turnover in group membership. They also report that group members were highly dependent upon them to provide logistical support in organizing public engagement events, Powell and Colin doing "the bulk of the work". Overall group members showed little motivation to do the hard work of learning about nanotechnology and organizing outreach events. Powell and Colin speculate that this was owing in part to time constraints imposed by group members' busy schedules. But in some important aspects of the process, such as the motivation to learn about nanotechnology through written and online readings, Powell and Colin (2009, p. 333) found that group members strongly preferred "in-person, interactive modes of learning (e.g., talking to other citizens, experts, and/or hearing lectures) over reading materials about nanotechnologies". But it seems unlikely a priori that deliberative processes can be very successful if citizens are not motivated to learn about relevant issues on their own or through written media.

The general success of group deliberations can depend greatly on how well prepared participants are to work inclusively with others and on the zeal they bring, on an ongoing basis, to the more laborious, time-consuming, or challenging aspects of the process. Inclusiveness and motivation are probably only important and necessary, but not sufficient conditions of successful group deliberation. But which character traits manifest them seems worth exploring.

Values, Virtues, and Environmental Education

The importance of character traits, or virtues, in deliberations on environmental problems is generally not addressed in the philosophical literature on environmental virtue nor on environmental education. This is not because scholars agree that current educational institutions adequately educate citizens to deliberate well. Most are critical (Hargrove 2008; Scott and Oulton 1998; Stables 2001). Rather, in criticizing current institutions and in proposing how they should be changed, scholars have not chosen to explore whether the wicked dimensions of many environmental problems should figure into their diagnoses. Consequently, those among them who have written on environmental education have focused almost exclusively on the values to which students should be exposed. This is true even of

those who have conceptualized environmental education as aiming primarily for character development rather than the acquisition of knowledge. At the same time, those who have written on environmental virtue have written largely on what might be called virtues of personal environmental concern, such as care and respect for nature, to the exclusion of virtues having more obvious significance for collective deliberation about environmental problems.

Eugene Hargrove, for example, begins with the combined observation that scholarly work in environmental ethics tends to be theoretical while different cultures relate differently to nature. Because of this, environmental educators should focus on "character development, in terms of values and virtues, rather than on the teaching of specific ethical principles" (2008, p. 264). In the Western context, Hargrove recommends that educators combat narrowly economic and utilitarian approaches to environmental problems by teaching students that "good is not the same thing as pleasure," that "we commonly value things for their own sake, not simply for their use," and that "values are not individually created in isolation, but rather are social ideals that have evolved over the centuries and are picked up by the members of society without much formal training" (2008, pp. 265–266). While knowledge of these facts might affect the character and conduct of students, Hargrove's conception of instruction in them is strikingly more like instruction in "specific ethical principles" than in the practice of good character.

Other studies, such as William Scott and Chris Oulton's study of environmental education policy in England, exclude the virtues entirely. Whereas a UK policy set out in 1990 explicitly defines environmental education as providing opportunities "to acquire…values…needed to protect and improve the environment," any reference to values instruction is omitted in a revision of the policy in 1996 (1998, p. 211). Scott and Oulton argue in favor of reinserting values instruction, subject to local experimentation and development, provided that "the world's [environmental] predicament is serious, and *if* environmentally sustainable development is the way forward" (219). They suggest in particular instruction that would promote the value of things like biodiversity, use of renewables and alternatives, conservation, stewardship, rights of indigenous peoples, and an equitable sharing of resources. However, they concede the difficulties of values education in the face of "more abstract, large-scale and remote issues such as acidification and global warming" (219), i.e., what we have been referring to as wicked problems.

Alongside this focus on values in the literature on environmental education, theorists who have written on environmental virtue have focused on virtues of personal environmental concern. By virtues of personal environmental concern, we mean those characterizing persons who could be expected to self-identify as environmentalists, endorse precaution in environmental decision making as a general rule, or advocate on behalf of the environment or victims of environmental injustice. Ronald Sandler's typology of environmental virtue, for instance, includes six kinds of environmental virtues, all of which characterize persons of this sort well. It includes land virtues, such as love, attunement, and gratitude for land; virtues of sustainability, such as frugality, farsightedness, and humility; virtues of communion with and respect for nature, such as wonder, ecological sensitivity, and care; virtues of environmental activism, such as cooperativeness and perseverance;

and virtues of environmental stewardship, such as benevolence and loyalty (Sandler 2007, p. 82). Much of the discussion on environmental virtues focuses on peoples' attitudes towards the environment or on what character traits will help someone maintain these attitudes and help others adopt them too. Virtues of personal environmental concern are not framed in terms of the sorts of deliberative activities needed to address wicked, environmental problems.[1]

Virtues of personal environmental concern probably overlap to some extent with what we would like to call *participatory virtues*, i.e., those important to a person's readiness to participate well in collective decision making. Participatory virtues are the sort that would have helped in the two cases described in the previous section. We will argue below that cooperativeness, perseverance, and a special epistemic kind of humility, for instance, are important participatory virtues. But traits like cooperativeness and perseverance are not unique to people who are especially concerned about the natural environment. Many qualities belonging to such persons, such as attunement, frugality, or wonder, are also not obviously essential to participatory environmental virtue. City loving, spendthrift urbanites could possibly be very good co-deliberators about environmental problems. To that extent the educational requirements of instruction in each kind of virtue will likely be different. Educators thus face questions about how to prioritize or balance education for values, virtues of personal environmental concern, and participatory virtue. Is some single virtue or subset of the virtues more important than the others? Or should educators seek to balance them more evenly?

Some might argue that getting people to take personal responsibility for the natural environment should be the top priority, so that educators should prioritize values and virtues of personal environmental concern over the participatory virtues.[2] We believe that values instruction and education for virtues of personal environmental concern should be important, but perhaps not overriding priorities. Values instruction is important if only because a person's values represent what she cares about, but it is possible that persons of traditionally good moral character do not much care about environmental issues. They should. But people who truly care about the natural environment do not simply say that they do when prompted. They are also disposed to act on their beliefs or do things like endorse precaution or advocate on behalf of the natural environment. Generally they are disposed to exercise virtues of personal environmental concern. So, since mere exposure to the values such people endorse is not likely to result in similar habits, education for virtues of personal environmental concern is important, too.

We are unsure, however, whether values and virtues of personal environmental concern should be of greater or roughly equal concern to participatory virtue. One reason for this is simply that we are only beginning in this paper to spell out

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[1] Though this may be changing to some extent as more scholars attend to the significance of intellectual virtues for environmental virtue ethics (Kawall 2009; Stafford 2010).

[2] One anonymous reviewer of this essay seems to endorse this view. See also Saylan and Blumstein (2011).

participatory virtue and to establish that it has any role at all in environmental education. But two substantive arguments can also be made for thinking that it ought to be given roughly equal weight.

First, most environmental problems are collective problems requiring collective solutions. However devoted individuals are to taking personal responsibility for the environment, problems such as ocean plastics pollution, respiratory disease, and climate change will persist until social systems, such as the energy, food, and transportation systems, are restructured. But such problems, as we have argued, have wicked dimensions. Consequently deliberating well about them will not, by definition, be a simple matter of weighing some commensurable set of pre-given values. Instead it will require exercises of judgment, practical wisdom, negotiation, or compromise.

For educators, this means that there is no clearly favored set of environmental values, nor virtues of personal environmental concern, they can present to their students as authoritative. At best shared values such as frugality, farsightedness, and ecological sensitivity have to be presented as common starting points from which we work out through collective deliberation what we ought to do relative to specific problems. This is the level of knowledge and inquiry that really matters and, we think, it is the level at which the exercise of participatory virtue is especially important.

Another related argument has to do with how educators, especially those in public institutions, should approach moral and civic education in circumstances of widespread disagreement about public policy, morality, and the good life. It is not possible to avoid moral (or civic) education by ignoring moral issues altogether in the classroom. Such silence itself communicates a relativistic moral outlook that only reinforces what students are liable to learn outside of the classroom (Sprod 2001). So it is necessary to address moral issues directly in some way or another. We believe the best way combines experiential learning strategies aiming to impart widely shared social values and virtues (such as frugality, farsightedness, ecological sensitivity) to a deliberative approach in which those same values and virtues are held up to critical reflection through classroom discourse and persuasive writing about moral problems.

How such an approach should be worked out in the school and classroom is something we cannot pursue here. The practical success of any particular version should also be tested empirically. However the general idea of the approach jibes with time-tested, Deweyan learning models in which knowledge is not merely received passively, but reconstructed in the learner through experience, active engagement with the subject matter, and critical dialogic inquiry with others (Dewey 1916, 1997; Kolb 1984; Paul and Elder 1999; Sprod 2001). It also addresses worries about the legitimacy of using educational institutions, public primary and secondary ones especially, for moral and civic education under conditions of pluralism. By adding a dialogic, deliberative component (in which students critically debate the merits of different approaches to moral problems) to experiential learning in widely accepted values and virtues, parents who dissent must object on different grounds than the indoctrination of their children.

Participatory Virtues

If addressing environmental problems well requires judgment, practical wisdom, negotiation, and compromise, it will require considerable participatory virtue. This is true even though participatory processes are often intended to enhance the epistemic adequacy of decision making by ensuring that the unique knowledge of all relevant stakeholders is brought to bear. As the SOLEC and CCoN cases suggest, the success of participatory processes can be undermined when participants do not communicate or conduct themselves inclusively and cannot be counted on to engage the more challenging parts of the process.

The SOLEC and CCoN cases do, however, point toward some of the virtues that would belong to participants of successful participatory processes, namely virtues enabling inclusiveness and engagement with the harder aspects of deliberation. In the service of inclusiveness, this suggests that virtues of reasonableness and fairness, empathy, temperance, and humility are important. On the other hand, the importance of engagement suggests a need for virtues like basic self-confidence, dependability, generosity, and patience and resilience. But the precise importance of such virtues, how exactly they should be characterized, and whether other virtues also matter, depends really on the goals that participatory activities seek to achieve. Provided they are plausibly regarded as virtues of persons generally, the most important participatory virtues are those best enabling achievement of those goals.

According to Dietz and Stern (2008, p. 71), participatory events of all kinds generally tend to serve three aims: (1) enhancing the quality of assessments or decisions, (2) securing the legitimacy of processes or decisions, and (3) enhancing the deliberative capacities of participants. This list of aims is widely accepted, though others may formulate the aims differently or argue that some one of them, e.g., the first is more fundamental than the others (Baber and Bartlett 2005). Some of these differences may make a difference to the account of participatory virtue one develops.

In their discussion of group-deliberative virtue, Aikin and Clanton (2010, p. 415), for instance, maintain that because group-deliberative processes characteristically achieve goals such as problem solving and the resolution of disagreement through the exchange and production of knowledge, "good epistemic outcomes" is their "ultimate objective." Consequently they argue that the central virtues of members of deliberative groups are those that, in one or the other of two ways, enable synergy between members of the group in the production of knowledge. In the first way, virtuous traits enable group synergy by improving the epistemic evaluation of whatever issue is at hand. In the second way, "they contribute to the deliberations, either by arguments *or by other non-argumentative means*, to the continued synergistic functioning of the group" (2010, p. 415; emphasis in original). They end up with a list of virtues including deliberative wit, friendliness, temperance, courage, sincerity, and humility.

This list of virtues to some extent aligns with those facilitating inclusiveness and engagement in participatory groups. However the central importance Aikin and Clanton place on the production of knowledge leads them both to include different virtues, such as wit and sincerity, and to characterize them largely in terms of cognitive habits. They characterize deliberative humility, for instance, as "the

willingness to hold one's own view fallibly and in such a way as to admit that one might be shown to be wrong in light of better reasons, evidence, and argument" (11).

The suggestion that knowledge is a very important goal of participation certainly goes along with other observations and theories about what makes participatory approaches succeed. When participants disagree at a particularly deep level, for instance, deliberative deadlock is liable to occur when participants' preconceived views of what is right go unchallenged. This is illustrated in numerous environmental conflicts where peoples' views about a particular action, like whether water should be diverted from a river, undermine their ability to compromise with each other and explore solutions that work in some way for all parties (Wilson and Morren 1990). On the other hand, the production of new knowledge through deliberation can reveal a previously invisible resolution that is acceptable to both (Gray 2003, p. 651). Group deliberations that proceed in a spirit of collaborative critical dialogue are more likely to succeed than those that do not.

Nevertheless, to say that something is the ultimate aim of a process is to make a particularly strong claim on its behalf. Everything else is of secondary importance and subserves this aim. We do not believe that the production of new knowledge relates in quite this way to participatory approaches to environmental assessment or decision making. In this context at least, the ultimate aim of participatory processes, if there must be one, is consensus around the best environmental policy. But the *best environmental policy* is just that one having to a high degree all of the desirable outcomes of participatory processes generally, such as quality decision making, legitimacy, and so on. The suggestion that such approaches ultimately aim to produce knowledge is also perhaps in tension with the frequently wicked nature of environmental problems. While new knowledge certainly can be produced in the course of confronting wicked problems, knowledge of a uniquely right or wrong answer about them is by definition not forthcoming.

So while we are suspicious of the view that knowledge is the ultimate aim of participatory processes generally, because of the distinctive role knowledge production plays in their success, we believe that participatory virtue will require virtues of epistemic productivity in addition to virtues of inclusiveness and engagement. These include the more cognitive virtues enumerated by Aikin and Clanton, such as sincerity and wit, but could probably be extended to include others, such as attentiveness and reasonableness, which either accompany or even underlie these others. In light of case studies like SOLEC and CCoN, however, we suggest that the non-epistemic virtues critical to group synergy include specifically virtues of inclusiveness and engagement. Many of the virtues Aikin and Clanton enumerate, such as friendliness and humility, well serve these ends, inclusiveness especially. But again, their list could be refined to include other more fundamental traits, such as basic self-confidence, and virtues that are apparently important to engaging the more challenging aspects of participation, such as dependability, resilience, and generosity, are altogether missing from their treatment. Because such virtues are so critical to getting and keeping people merely involved in participation, they are critical to enabling deliberative groups to harness the epistemic advantages inherent in participatory approaches. In that sense they are perhaps more important generally to successful participation than the more cognitive virtues Aikin and Clanton emphasize.

Consider for instance *basic self-confidence*. This is an abiding general security in the experience and expression of one's needs, feelings, or beliefs, as well as in one's ability to complete difficult or new tasks through one's own efforts or by finding appropriate help (Honneth 1995; Brown 1986). Persons having it should be contrasted, on the one hand, to arrogant persons, who never see any reasons for self-doubt, and on the other to overly self-critical persons. In participatory contexts, the basically self-confident person is less likely to shrink in fear or self-doubt from the process when confronted by new and complicated information, such as that found in a scholarly journal article. But they are also more likely to exhibit courage in deliberatively important circumstances, such as when dealing with perceived authorities (scientists or government actors, for instance). Yet this courage is also less likely to spill over into deliberative *hubris*, a trait incompatible with deliberative humility, insofar as the basically self-confident person's sense of self-worth does not hang on winning or losing an argument. Basic self-confidence is thus important both because of the role it plays in the motivation to engage difficult tasks and as a psychological prerequisite of deliberative courage and humility.

For a second example, consider also *reasonableness*. Reasonableness is a willingness to cooperate on fair terms and advance fair proposals (Rawls 1996). The reasonable person acknowledges the stake others have in practical decisions and seeks solutions that are desirable both from her and their point of view. To that end she does not take advantage of imbalances of power to advance her position and is thus inclined to exhibit virtues of deliberative friendliness, sincerity, empathy, and charity. But for the reasonable person doing so cannot be a tactic to win allies or even to achieve optimal epistemic outcomes. This is not true of merely rational persons, that is, those who know what their interests are and who pursue them through the best available means. The reasonable person's motivations are broader and the interests of others carry significant weight in her deliberations.

We conclude that a number of qualities not on Aikin and Clanton's list seem to be important participatory virtues, including basic self-confidence, attentiveness, dependability, reasonableness and fairness, generosity, and patience and resilience. Some of these virtues, such as attentiveness and dependability, simply supplement or elaborate the deliberative virtues Aikin and Clanton enumerate. But others, such as basic self-confidence and reasonableness, are more fundamental psychological antecedents of good deliberative character. Altogether participatory virtue seems to be comprised of at least the qualities on Table 1. Space forbids including a full description of these virtues here. But the first seven virtues on the list are those enumerated by Aikin and Clanton. The remainder consists of those we suggest should be added. Probably more could be added and more work needs to be done to clarify the relationship between those on the list. But if our account of the aims of participatory approaches to decision making is accurate, this list should be reasonably accurate. Those aims are diverse and include not just the production of knowledge, but also things like consensus building and enhancing the deliberative capacities of citizens. Virtues of inclusiveness and engagement are especially important to achieving those aims. Our list reflects that by including virtues that have them as their primary aim or target (this is what the check marks indicate). But the idea that virtues have a target is a loose one. A virtue can be good for many

Table 1

Virtue	Inclusiveness	Engagement	Epistemic productivity
1. Wit			✔
2. Friendliness	✔		
3. Empathy, charity	✔		✔
4. Courage		✔	
5. Temperance	✔		
6. Sincerity			✔
7. Humility	✔		✔
8. Basic self-confidence		✔	
9. Resilience, persistence		✔	
10. Attentiveness		✔	✔
11. Dependability		✔	
12. Reasonableness, fairness	✔		
13. Generosity	✔	✔	
14. Patience	✔	✔	

different things and some virtues seem to have more than one primary aim. Indeed in ideal deliberative contexts, the participatory virtues work together to generate an atmosphere of collaborative critical dialogue through which the deliberative capacities of citizens are recruited to produce legitimate, high quality environmental decisions. Along the way, the deliberative capacities of citizens will hopefully be sharpened, too.

Conclusion

Because environmental problems have wicked dimensions, public participation processes are appropriate approaches to dealing with them. But especially in wicked scenarios, participation processes that are well structured can fail if participants possess traits that impede deliberation. Previous lists of virtues for deliberations should be refined to include others that are critical to getting and keeping people merely involved in participation and enabling deliberative groups to harness the epistemic advantages inherent in participatory approaches. Consequently environmental educators should endeavor to cultivate these virtues when preparing students to participate as good citizens in public processes for environmental decision making and assessment.

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