# The Epistemology of Democracy

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**ABSTRACT**

This paper investigates the epistemic powers of democratic institutions through an assessment of three epistemic models of democracy: the Condorcet Jury Theorem, the Diversity Trumps Ability Theorem, and Dewey's experimentalist model. Dewey's model is superior to the others in its ability to model the epistemic functions of three constitutive features of democracy: the epistemic diversity of participants, the interaction of voting with discussion, and feedback mechanisms such as periodic elections and protests. It views democracy as an institution for pooling widely distributed information about problems and policies of public interest by engaging the participation of epistemically diverse knowers. Democratic norms of free discourse, dissent, feedback, and accountability function to ensure collective, experimentally-based learning from the diverse experiences of different knowers. I illustrate these points with a case study of community forestry groups in South Asia, whose epistemic powers have been hobbled by their suppression of women's participation.

One important branch of social epistemology investigates the epistemic powers of institutions. Call this branch "institutional epistemology." It asks questions such as this: do institutions of a particular type have the ability to gather and make effective use of the information they need to solve a particular problem? Given the epistemic powers of such institutions, what problems ought to be assigned to them? How can they be designed so as to improve their epistemic powers?

These questions are of particular importance when the problems we need to solve demand the utilization of information that is highly dispersed across society. Somehow, information in the heads of many disparate actors must be brought to bear on the solution to the problem. Different institutions can be evaluated according to their ability to mobilize and respond to the required information. Friedrich Hayek, a pioneer theorist of institutional epistemology, established one of its central findings (Hayek 1945): that the problem of efficiently allocating resources cannot be solved by centralized state planning, because no central body is able to gather into itself all of the widely dispersed information needed to solve this problem. The only adequate vehicle for transmitting the required information is market prices. Markets uniquely generate and transmit the required information; central planners have no market-independent access to it. Hence, the problem of resource allocation should be assigned to markets, not to states.

Socially dispersed information can be transmitted in three forms: talk, votes, and

market prices. Markets respond primarily to price information; democratic states primarily to talk and votes. So Hayek's work raises the question of what problems we need votes and talk—democratic institutions—to solve. Beyond this question, institutional epistemology calls for an assessment of the epistemic powers of alternative designs for democratic institutions. In this paper, I shall propose an epistemic analysis of democratic institutions designed to advance this aim. My first task shall be to construct a model of democracy that adequately represents its epistemic powers and reveals the epistemic functions of its constitutive institutions (such as periodic elections and a free press). I shall argue that John Dewey's experimentalist account of democracy offers a better model of the epistemology of democracy than alternatives. One of the advantages of Dewey's model is that it allows us to represent dissent, even after a decision has been made, as epistemically productive, not merely a matter of error. Following Dewey's model, I shall offer an account of the multiple epistemic roles of dissent at different points in democratic decision-making. Finally, I will address questions of democratic design through a case study of community forestry groups in South Asia. These groups aim to manage the forest commons, so as to provide sustainable levels of forestry products for community use. I shall show how the exclusion of women from participation in community forestry groups hobbles the epistemic powers of these groups, by excluding the situated knowledge women have of the capacities of local forests. A Deweyan epistemic analysis of democracy thus provides a powerful tool for advancing the reform of democratic institutions.

The epistemic needs and powers of any institution should be assessed relative to the problems it needs to solve. Let us therefore begin with a sketch of the characteristics of problems democratic states need to solve. These are problems (a) of public interest, the efficient solution to which requires (b) joint action by citizens, (c) through the law. The last two conditions indicate why the solution cannot be left up to the unregulated voluntary choices of individuals or private associations. The first sets a constraint on what problems may be legitimately assigned to state action. Suppose we asked what it would take to solve the "problem" of religious pluralism. Empowering the majority to establish their preferred religion and forbid all rivals by law would solve this "problem," and is probably the only effective way to solve it. Hence, the last two conditions for expecting the state to solve the problem are satisfied. However, for whom is this a problem? Christian evangelists consider the fact that millions of people are not Christian to be a problem for them. But it is not a problem of *public* interest. Citizens of modern democracies have declined to authorize the state to dictate to individuals what their religion should be, and thereby declared religious problems to be of private interest. Since democratic states should not be in the business of solving such problems, their epistemic needs are therefore reduced: they have no need for theological expertise.

The requirement that the problems to be solved by democratic institutions be of public interest helps explain why votes and talk rather than prices are the appropriate form of information to which states should be responsive. Prices transmit information about private preferences. But as we have seen from the religious case above, the mere fact that a private preference is widely held does not make it a public interest. Talk is needed to articulate proposals to make certain concerns a matter of public interest; votes are

needed to ratify such proposals.

This account of the problems democratic states need to solve helps us devise criteria of success for democratic institutions. There is a longstanding tension in democratic theory between accounts of success that are internal and external to the democratic decision-making process (Estlund 1997). Internalists, or proceduralists, hold that, to vindicate a decision-making process, one need only show that it is procedurally fair. This position neglects the instrumental functions of democracy. If we decide that a problem, such as air pollution, is of public interest and that dealing with it requires joint action under the law, we don't just flip a coin to decide what pollution laws to enact, even though this would be procedurally fair. Rather, we will judge the success of democratic institutions according to criteria that are (partially) external to the decision-making process: do the pollution laws enacted actually reduce pollution to acceptable levels, at an acceptable cost? The *ex ante* popularity of a law—its approval by a majority—may make its enactment legitimate. But that does not ensure that the law will be successful. Whether the law succeeds in solving the problem for which it was drafted depends on its external consequences—not, or not simply, on the fairness of the procedure by which it was enacted.

Thus, at least part of the criterion of success for laws is external to the decision-making process. Laws can get things right or wrong. Epistemic democrats focus on the question of whether democratic institutions can be relied upon to make the right decisions, according to external criteria. Yet we cannot judge the success of the law by external, instrumental criteria alone. Whether a problem counts as of genuinely public interest is determined in part by whether it is an actual object of public concern—that is, by whether citizens or their representatives affirm its place on the public agenda through procedurally fair decision-making processes. Furthermore, whether the solution works depends on what (possibly unintended) consequences are deemed acceptable by the public, which in turn is partially determined by democratic decision-making processes. Hence, the criteria of success for democratic institutions are partly internal and partly external to the decision-making process (Richardson 1997).

## THREE EPISTEMIC MODELS OF DEMOCRACY

With this sketch of the type of problem democracy needs to solve, and of the internal and external criteria of success for its solutions, we may now turn to the question of how to model the powers of democracy to gather and deploy the information necessary to craft sound solutions to its problems. Three models offer epistemic analyses of democracy: the Condorcet Jury Theorem, the Diversity Trumps Ability Theorem, and Dewey's experimentalist account of democracy. I shall assess these models by the following criteria: (a) do they exhibit the epistemic functions of the constitutive institutions of democracy? (b) do they reveal the epistemic merits and demerits of these institutions? and (c) do they provide guidelines for improving their epistemic powers? Of the three models, I shall argue that Dewey's offers the best model of the epistemic powers of democratic institutions and ways to improve their epistemic success.

The most popular epistemic account of democracy rests on the Condorcet Jury Theorem (Condorcet 1995 [1785]). This theorem states that if voters (a) face two options,

(b) vote independently of one another, (c) vote their judgment of what the right solution to the problem should be (i.e., they do not vote strategically), and (d) have, on average, a greater than 50% probability of being right, then, as the number of voters approaches infinity, the probability that the majority vote will yield the right answer approaches 1 (and rapidly approaches 1 even with modest numbers of voters). Given the strength of this result, it is no wonder that many epistemic democrats have championed the Condorcet Jury Theorem as the key to vindicating the epistemic powers of democracy (Cohen 1986; Gaus 1997; Grofman and Feld 1988). The favorable results of the Condorcet Jury Theorem have been generalized to cover plurality voting over multiple options (List 2001), supermajority voting rules (Fey 2003), and even some cases in which individual voters have less than 50% chance of being right (Estlund 1997, 188).

Despite these heartening results, the Condorcet Jury Theorem does not offer a particularly illuminating account of the epistemic powers of democracy. In the first place, it works even if voters are epistemically homogeneous. (Indeed, Condorcet's original proof assumed homogeneity). Yet an important part of the epistemic case for democracy rests on the epistemic diversity of voters. Most of the problems democracies are asked to solve are complex, and have asymmetrically distributed effects on individuals according to their geographic location, social class, occupation, education, gender, age, race, and so forth. Since individuals are most familiar with the effects of problems and policies on themselves and those close to them, information about these effects is also asymmetrically distributed. Surely an important part of the case for the epistemic merits of democracy rests on its ability to pool this asymmetrically distributed information about the effects of problems and policies so as to devise solutions that are responsive to everyone's concerns. We therefore need a model of democracy in which its epistemic success is a product of its ability to take advantage of the epistemic diversity of individuals.

Second, the Condorcet Jury Theorem supposes that voters vote independently of one another. While this does not rule out all influence of voters on one another (Estlund 1994), it is unclear whether the Theorem is robust under the actual patterns of influence characteristic of modern democracies (Estlund 1997, 189). More importantly, a free press, public discussion and hence mutual influence prior to voting are constitutive, not accidental features of democracy. Without access to public fora for sharing information and opinions beyond their immediate knowledge, voters are uninformed and often helpless. (Consider the vacuity of shareholder voting, given that few shareholders have any information about the records and positions of the nominees for corporate boards of directors.) The Condorcet Jury Theorem puts the two forms of information pooling characteristic of democracy—votes and talk—potentially at odds with one another. An adequate model should show how they work together. Discussion is needed prior to voting in part to help voters determine what problems are genuinely of public concern. Without such discussion, they have little to go on but their private preferences. But unlaundered private preferences are not the best input into democratic decision-making (Anderson 2002; Herzog 2000), precisely because, as we have seen in the religion case, they do not constitute a public interest, even in aggregate. Hence, besides failing to model the epistemic functions of core democratic practices, the Condorcet Jury Theorem

also potentially pits the internal and external criteria of success for democracy against one another.

Third, the Condorcet Jury Theorem fails to capture the *dynamic* features of democracy's epistemic functions. Whether the laws succeed in solving the public problems they were designed to solve is a function of their consequences, not of their *ex ante* popularity. Often, majorities converge on an inefficient solution because they fail to anticipate certain consequences of the policies they adopt. When Medicare Part D, providing prescription coverage for US senior citizens, was enacted, most thought that lack of money was the chief obstacle to seniors' effective access to needed drugs. Few anticipated that the proliferation of subsidized private insurance plans, each with different rules and formularies, would cause confusion among seniors, especially in conjunction with rising rates of dementia, or that this would also dramatically escalate administrative costs to health care providers, such as nursing homes. Democratic decision-making needs to recognize its own fallibility, and hence needs to institute feedback mechanisms by which it can learn how to devise better solutions and correct its course in light of new information about the consequences of policies. Periodic elections are one critical feedback mechanism of this sort. The Condorcet Jury Theorem does not represent the necessity of such mechanisms. Since it suggests that majorities are nearly infallible from the start, why would they ever need to correct their initial decision? The simplicity of the Condorcet Jury Theorem's representation of democracy, in representing only the moment of voting, also disables investigation into how to improve the epistemic functioning of democratic institutions beyond the voting booth.

The Diversity Trumps Ability Theorem helps solve some of the deficiencies of the Condorcet Jury Theorem. This theorem states that if (a) the problem is hard (no individual always gets it right), (b) the problem solvers converge on a finite set of solutions, (c) the problem solvers are epistemically diverse (they don't all converge on the same local optimum), and (d) there are many problem solvers who work together in moderate sized groups, then a randomly selected collection of problem solvers outperforms a collection of the best problem solvers (Hong and Page 2004; Page forthcoming 2006). Surowiecki (2004) offers additional support for the general intuition behind the DTA, that diverse collections of nonexperts do a better job than experts in solving many problems. The DTA Theorem supports the claim that democracy, which allows everyone to have a hand in collective problem solving, is epistemically superior to technocracy, or rule by experts.

The DTA Theorem, although initially constructed to model problem solving within firms, represents many of the epistemically relevant features of democratic decision-making that are neglected by the Condorcet Jury Theorem. First, the DTA theorem explicitly represents the epistemic diversity of citizen inputs into democratic decision-making as an epistemic asset. Second, the DTA theorem models some of the epistemic functions of citizens' associations and political parties. Parties organize citizens' multifarious concerns into issues, agendas, and platforms, and thereby hone down the list of available solutions to a manageable number. They also help diverse citizens work together in smaller groups to hammer out proposed solutions to problems. Third, the DTA theorem models discussion as epistemically productive, not merely as

something that potentially interferes with the epistemic virtues of vote aggregation. Finally, it focuses on the types of problems we would expect democracies to be superior in solving—namely, complex problems. It is plausible to suppose that autocratic governments can solve relatively simple problems, such as catching murderers, as well as democratic governments. We would expect autocratic governments to perform worse than democratic governments when problems and solutions are complex, with asymmetrically distributed effects and hence asymmetrically distributed information about those effects. State decision makers cannot respond to diverse effects of which they are unaware. It takes input from diverse citizens, along with an accountability mechanism to ensure that these inputs are taken seriously, to make states responsive to such effects. Democracies are designed to be responsive to such inputs; autocracies generally are not.

Despite these virtues of the DTA Theorem, it fails to model two other features of democracy: the noninstrumental importance of universal inclusion (i.e., a universal franchise and free speech for all), and the dynamic aspects of democracy. The DTA Theorem represents epistemic diversity as instrumentally valuable, and universal inclusion as potentially so, insofar as it ensures the inclusion of whatever epistemic feature (information, heuristics, perspicuous representation) may hold a vital key to the solution of some particular problem. But universal inclusion is also essential to ensuring satisfaction of the internal criterion of success for democratic decision-making: that the decisions fairly represent everyone's concerns, and thereby represent an object of public concern. Even more importantly from an epistemic point of view, the DTA Theorem does not model the epistemic functions of periodic elections and other feedback mechanisms designed to change the course of collective decisions in light of information about their consequences.

John Dewey offered an experimentalist account of the epistemic powers of democracy. He characterized democracy as the use of social intelligence to solve problems of practical interest (Dewey 1981a; Putnam 1990). Practical intelligence embodies an experimental method (Dewey 1976). Deliberation is a kind of thought experiment, in which we rehearse proposed solutions to problems in imagination, trying to foresee the consequences of implementing them, including our favorable or unfavorable reactions to them. We then put the policies we decide upon to an actual test by acting in accordance with them and evaluating the results. Unfavorable results—failures to solve the problem for which the policy was adopted, or solving the problem but at the cost of generating worse problems—should be treated in a scientific spirit as disconfirmations of our policies. They give us reasons to revise our policies to make them do a better job solving our problems. Practical intelligence, then, is the application of scientific method to practical problems. This requires abandoning dogmatism, affirming fallibilism, and accepting the observed consequences of our practices as the key evidence prompting us to revise them. Dewey took democratic decision-making to be the joint exercise of practical intelligence by citizens at large, in interaction with their representatives and other state officials. It is cooperative social experimentation.

Dewey's model is the only one of the three that represents the epistemic powers of all three constitutive features of democracy: diversity, discussion, and dynamism

(feedback). Dewey stressed the central importance to democracy of bringing citizens from different walks of life together to define, through discussion, what they take to be problems of public interest, and to consider proposed solutions (Dewey 1981c). He saw that universal inclusion of diverse citizens was essential to satisfying both the internal and external criteria of success for democratic decision-making. Exclusion casts doubt on the claim that problems and solutions as defined by those allowed to participate are truly in the public interest—responsive in a fair way to everyone's concerns, insofar as they legitimately lay a claim on public action. It also undermines the ability of collective decision-making to take advantage of citizens' situated knowledge—the fact that citizens from different walks of life have different experiences of problems and policies of public interest, experiences that have evidential import for devising and evaluating solutions. Universal inclusion makes maximal use of such situated knowledge, which we have seen is critical for solving the kinds of complex problems modern democracies face. Collective, democratic discussion and deliberation is a means of pooling this asymmetrically distributed information for decision-making.

Most importantly, Dewey's experimentalist model of democracy helps us see the epistemic import of several democratic institutions that sustain its dynamism, its capacity for change: periodic elections, a free press skeptical of state power, petitions to government, public opinion polling, protests, public comment on proposed regulations of administrative agencies. In Dewey's model, these are mechanisms of feedback and accountability that function to institutionalize fallibilism and an experimental attitude with respect to state policies. They push governments to revise their policies in light of evidence—public complaints, as expressed in both votes and discussion—that they are not working, or expected not to work. On Dewey's model, votes and talk reinforce one another, the votes helping to insure that government officials take citizens' verbal feedback seriously, the talk helping to define and articulate the message conveyed by votes.

Dewey stressed that for democracy to work, it was not enough simply to institute legal arrangements such as representation and periodic elections. Culture had to change too, so that citizens at large, interacting with one another in civil society, welcome diversity and discussion, and take an experimental attitude toward social arrangements. "The future of democracy is allied with the spread of the scientific attitude" toward practical affairs (Dewey 1981b, 167). If the people themselves are hidebound and dogmatic, thinking, for example, that social arrangements *must* follow tradition, or revert to principles laid down in an ancient religious text, they will not be prepared to take the untoward consequences of current habits, or policies following ancient principles, as evidence disconfirming their claim to practical success.

Dewey's experimentalist model enables a fairly fine-grained assessment of the epistemic powers of social arrangements, both legal and cultural. Diversity and discussion need to be embodied and facilitated in the institutions and customs of civil society. If a social arrangement has a systematic and significant impact on some social group, information about that impact needs to be conveyed to decision makers. This typically requires that the group organize into an association or party, so that its members can share their experiences and, through discussion, articulate shared complaints and advance proposals to address them. The lack of such associations in civil society makes the state blind to

the impacts of its policies, and decision makers immune from accountability for these impacts, even if the formal apparatus of democracy is in place. This helps explain why democrats in post-Communist Europe have focused so much energy on the construction of civil society, rather than constitutional arrangements: they had to overcome the legacy of totalitarianism, which systematically destroyed independent associations of citizens by forbidding independent political parties and assemblies of citizens.

Once citizens are organized into multiple, cross-cutting organizations, they need access to channels of communication with one another and with government decision makers. This requires that media be open and accessible to all. Media concentration, especially if it enables public officeholders, or a handful of private media owners, to effectively censor dissent, undermines the epistemic powers of democracy. (A case in point is Italy under Silvio Berlusconi, who owns most of the private media in Italy, and as Prime Minister controlled the public media as well, using his power to minimize the access of his critics to wide audiences.) Moreover, effective communication of complaints and proposals requires not just that people be free to speak their minds, but that they be open to listening to others. If people smear, shout down, or abuse those who disagree, or regard diversity as a threat, the words of the excluded, if they dare to talk, will fall on deaf ears.

> Intolerance, abuse, calling of names because of differences of opinion about religion or politics or business, as well as because of differences of race, color, wealth or degree of culture are treason to the democratic way of life. For everything which bars freedom and fullness of communication sets up barriers that divide human beings into sets and cliques, into antagonistic sects and factions, and thereby undermines the democratic way of life. Merely legal guarantees of the civil liberties of free belief, free expression, and free assembly are of little avail if in daily life freedom of communication, the give and take of ideas, facts, experiences, is choked by mutual suspicion, by abuse, by fear and hatred (Dewey 1981a, 227–8).

To realize the epistemic powers of democracy, citizens must follow norms that welcome or at least tolerate diversity and dissent, that recognize the equality of participants in discussion by giving all a respectful hearing, regardless of their social status, and that institute deliberation and reason-giving, rather than threats and insults, as the basis of their communication with one another. An epistemic analysis of democracy helps us see that it is not just a matter of legal arrangements. It is a way of life governed by cultural norms of equality, discussion, and tolerance of diversity.

## THE EPISTEMIC IMPORT OF DISSENT

Diversity and disagreement are central features of democracy. An adequate epistemic model of democracy needs to represent its functions at all stages of decision-making: during deliberation, at the point of decision (voting), and after a decision has been made. Dewey's experimentalist account of democracy, uniquely among the three models reviewed here, provides roles for dissent at each of these stages.

Consider first disagreement during group deliberation, prior to decision-making. We have already seen that the expression of disagreement during group deliberation draws decision makers' attention to asymmetrically distributed information and diverse

problem-solving strategies that may be relevant to the solution of public problems. Both Dewey's experimentalist model of democracy and the DTA theorem capture this epistemic function of disagreement, while the Condorcet Jury theorem neglects it. In addition, the comprehensive expression of diverse points of view is needed to define through compromise (Richardson 1997, 360-3) what counts as a problem of genuinely public interest, rather than merely private or sectarian interest.

Dissent prior to decision-making is a necessary condition for the formation of a genuinely collective will consistent with the autonomy of each member. This point may seem surprising. We are tempted to think that for a collective to genuinely will something, each of its members must already will it individually and wholeheartedly. Gilbert (1989) has shown that collective willing does not require such unanimity at the individual level, but simply a willingness to accept the collective decision as authoritative for the group (even if one privately dissents), and to do one's part in upholding the decision. Westlund (2003) has shown even more: that the formation of a collective will consistent with the autonomy of each of the group's members requires some resistance at the individual level to anyone else's proposal, so that the eventual object of joint willing is the product of mutual accommodation and compromise rather than blind subordination. Pure deference to a leader who claims to embody the collective will, however wholehearted it may be, is incompatible with the autonomy of individual members. Translated into political terms, the contrast drawn here is that between democracy and the politics of mass enthusiasm familiar to us from the French Revolution through 20th century fascism and communism.

However important epistemic diversity might be to discovering the solution to problems of public interest, and even to constructing the very definition of these problems, we still might wonder whether it has any function at the stage of decision-making itself. Why allow the decision of a majority to stand as the decision of all? Why settle for this, rather than unanimity? The conventional answer is that groups could hardly ever decide anything, if unanimity were required. But this answer is not fully satisfactory, given that some groups—Quaker meetings, for instance—do make decisions by consensus.

A more satisfactory answer considers the costs of achieving consensus. Precisely because collective decisions are so often necessary and urgent, conditioning decisions on the achievement of consensus often leads to undue pressure on and even coercion of dissenting minorities. Such coercive pressure is objectionable in itself. It also carries severe epistemic costs. Consensus implies that everyone agrees that all objections to a proposal have been met or at least overridden by more important considerations. The parties to a consensus are therefore expected to hold their peace once a decision is made, on the pretense that all their reservations were met. This norm suppresses public airing and responsiveness to the continuing reservations individuals may have about the decision. Majority rule, while it permits majorities to override minority objections, does not pretend to have fully answered those objections. Minority dissent remains open rather than suppressed, reminding us that any given decision remains beset by unresolved objections (Manin 1987, 359).

For this reason, individuals must be free to dissent not just at the voting stage, but after a decision is made. This requires institutionalization of a "loyal opposition." Without an

opposition to remind the public of continuing objections to collective decisions, and to pose alternatives, accountability of decision makers is impossible. Nothing would force decision makers to reconsider their decisions. Only with such continuing opposition can fallibilism and the institutional capacity for experimentation—revising one's decisions on the basis of experience with their consequences—be realized. Epistemic accounts of democracy, such as the Condorcet Jury Theorem, that represent the majority as virtually infallible, fail to explain the epistemic importance of post-decision dissent. Such dissent is needed not simply to keep the majority in check, but to ensure that decision-making is deliberative—undertaken in an experimental spirit—rather than simply imposed.

> A power that faces no obstacle will have both less cause to deliberate on its decisions and less need to justify them. The true goal of the pluralism of counterforces is not equilibrium; it is deliberation itself (Manin 1987, 361).

Hence, any assessment of the epistemic powers of particular democracies must pay close attention to its institutions and norms of dissent: are there diverse, open, accessible channels for people from all walks of life, in all social positions, to publicly express dissent? Do social norms welcome the expression of dissent by all discontented parties? Do they require decision makers to take dissent seriously, and hold them accountable if they don't? Negative answers to these questions indicate epistemic weaknesses in political decision-making.

## Assessing the Epistemic Powers of Democratic Institutions: A Case Study of Community Forestry Groups in South Asia

Dewey's experimentalist account of democracy as the collective exercise of practical intelligence offers rich resources for evaluating the epistemic powers of particular democratic institutions, and for suggesting reforms to improve these powers. Suppose we can identify a problem of public interest. We can then investigate what information is relevant to solving that problem and who has that information. With this understanding in hand, we can trace the paths by which this information is conveyed to political decision makers—or, if the democratic system is not working well, the institutional and informal obstacles to conveying that information and ensuring its effective uptake by decision makers. Once these epistemic obstacles are identified, we can experiment with reforms to overcome them, testing reforms by their ultimate impact on the epistemic powers of decision-making bodies.

Bina Agarwal's research on community forestry groups (CFGs) in India and Nepal provides an excellent case study of how a Deweyan experimentalist model of democracy can inform efforts to improve the epistemic powers of particular democratic institutions. CFGs are democratic institutions, organized at the village level, charged with the task of sustainably managing forestry commons. They were set up in response to the gross degradation of local forests that attended unregulated harvesting from the commons. In many villages, before CFGs were established, degraded forests provided little more than twigs and monsoon grass. Five to seven years after CFGs started to manage the

commons, villages enjoyed flourishing forests, greater biodiversity, and higher incomes (Agarwal 2000, 285).

This sounds like an unmitigated success story. However, many of these benefits of CFGs were obtained at a severe cost to women, who are primary users of the forest (Agarwal 2001, 1630–4). The gendered division of labor in South Asia assigns to women the task of gathering firewood for cooking and heating bath water, and fodder for farm animals. About half of the CFGs surveyed by Agarwal have banned the collection of fuel and fodder from village forests. This has forced women in affected villages to travel much further to obtain these products. In many villages, women who once needed only 1-2 hours per day to gather firewood now need 4-5 hours to do so, and must take their daughters out of school to help them, thereby limiting their daughters' educations (Agarwal 2000, 286). As strangers entering distant villages with unregulated forestry commons, they have suffered abuse from locals who resent their intrusion. Women have had to resort to alternative fuels, such as dung and dry leaves, which require constant tending to keep alight. This has increased cooking time and prevented women from engaging in other tasks while food is cooking. Inferior fuels also increase indoor air pollution, to the detriment of women's health, since women must spend more time inside the home than men. Cropland has had to be diverted to the production of fuel and fodder, while more money has had to be spent on expensive kerosene. Some women have had to give up burning fuel for heat in the winter (Agarwal 2001, 1634). Women also complain that the male guards assigned the task of enforcing bans on gathering wood in the forest are ineffective, because, never having had to gather firewood themselves, they don't know where the best foraging grounds are. Faced with inept guards, who fail to prevent rule-breakers from gathering wood, some women have decided to defy the guards themselves.

South Asian women thus have several complaints with the ways their village CFGs are managing the common forests. They also suggest remedies. They argue that the forests could sustain much higher levels of foraging than currently allowed, especially if more trees of the species optimal for household uses were planted. They also argue that female or mixed-group guards would be more effective at stopping rule-breakers than all-male guards, because women know better where the rule-breakers are likely to look for wood, are not deterred by the threat of sexual harassment charges by women who are apprehended, and because, being more effective, women would respect their orders more than they respect the orders of inept all-male guards (Agarwal 2000, 288–9).

There is reason to believe that the women are right. Because the gendered division of labor assigns women the responsibility of gathering wood, women also know better than men how much firewood can be sustainably gathered from the forest, which species are best for fuel and fodder, and where foragers are likely to go to gather wood. This is a classic case of situated knowledge that is distributed asymmetrically by gender. This is not to say that men *can't* discover this knowledge. Indeed, outside natural resources experts—some of whom, presumably, are men—have confirmed the local women's view that community forests can sustain wood gathering at far higher levels than many CFGs have allowed (Agarwal 2001, 1635). However, poor South Asian villages rarely have access to knowledge gathered by formally trained natural resources experts. Their dependence

on locally generated knowledge makes it all the more important that they take advantage of women's situated knowledge to solve locally identified problems.

Why aren't many CFGs making effective use of local women's situated knowledge? Agarwal identifies numerous formal and informal obstacles to the uptake of women's ideas by CFGs. Women's membership in CFGs is usually low: on average, less than 10% of CFG members are women (Agarwal 2001, 1626). Rules that restrict membership to one person per household, in conjunction with the sexist norm that the male "head" of the household represents its interests to the outside world, severely limit women's participation. The gendered division of labor, in conjunction with CFG meeting times that coincide with women's household tasks, such as cooking and feeding animals, prevent women from attending meetings even if they are members. Women often don't hear about meetings or decisions of the CFG, and are even less frequently consulted about those decisions. Male members' habits of drinking, carousing, and getting into fights during CFG meetings function as additional deterrents to female presence. Other sexist norms, prescribing that women sit separately from men (in practice, in the back or side of the room, where they will rarely be recognized), keep quiet, and don't challenge men's authority, prevent female members from speaking out. When some get the courage to speak out, men, presuming that women have nothing serious to contribute, refuse to listen or even leave the room (Agarwal 2001, 1626–8, 1638–40).

Before women's knowledge can be used to solve the problems that women have identified, CFGs need to be reformed so that women can join, speak up, and be heard. Ideally, we would want the political order to be so structured as to include methods of self-correction, so that it can steadily increase its epistemic powers. This is the point of the Deweyan model of democracy as an embodiment of scientific method. Just as the solution to scientific problems is to do more science, "the cure for the ailments of democracy is more democracy" (Dewey 1981c, 327). For democracy, like science, embodies the two practices crucial to self-correction: dissent and experimentation.

In some villages with unresponsive CFGs, women have forced the issue of female exclusion onto the agenda of CFGs by defying all-male guards, and refusing to obey foraging rules adopted by male-dominated CFGs that disadvantage women. Women's vigorous dissent has forced some CFGs to add women to their patrols—an experiment that has proven its worth by the fact that female guards have improved the effectiveness of patrols and the legitimacy of the rules they enforce (Agarwal 2000, 289). Women have also brought their complaints about exclusion to other institutions, such as the national government and NGOs, which then pressure CFGs to include more women (Agarwal 2000, 304).

Dissent works in conjunction with experimentation, aimed at discovering how to make dissent itself more effective as an input to deliberation. In South Asian CFGs, many women have found disagreement difficult to voice, because they have internalized gendered norms of silence and deference to men. They lacked the courage to speak out, fearing not just that their opinions would be ignored by men but that their reputations would be damaged by participation in mixed-gender public settings. Experimentation has shown that the presence of a critical mass of women in CFG meetings reduces the stigmatization of the women who participate. With a critical mass, women's participation

is seen as normal, rather than an aberration. Women have also discovered that they are emboldened to speak out in CFG meetings if they caucus as women beforehand. Practice speaking in all-women's groups helps them find the courage to speak in mixed-gender groups. Discussion in the women's caucus also helps women articulate a common agenda. This increases their effectiveness in CFG meetings, both because they are more willing to speak out, knowing that their points will at least be taken up by other women, and because the fact that their points are taken up by others reinforces their salience to the whole group, making them harder for men to ignore (Agarwal 2001, 1643–4).

Agarwal's study of CFGs illustrates the relative merits and defects of the three epistemic models of democracy considered in this paper. The diversity of participants by gender, including women's knowledge, plays a key role in enhancing the ability of CFG policies to solve the problem of firewood and fodder shortages. So does discussion: women need to talk among themselves to hammer out a common agenda that they are able to bring to the floor, and need to address the whole group to get their ideas incorporated into CFG policies. Since the Condorcet Jury theorem does not represent diversity and discussion as critical to the epistemic powers of democracy, it is unable to see a problem when these elements are missing from actual democratic institutions. The DTA Theorem is superior to the Condorcet Jury Theorem in representing these features of democracy (notably, the value of small-group discussion in generating proposed solutions to problems). However, its model of democracy is incomplete. Agarwal's study shows how universal inclusion plays a non-instrumental role in legitimizing outcomes: when women were excluded from any voice in formulating and ratifying rules restricting foraging, they perceived these rules as unfair and were more likely to break them. Their post-decision dissent, in the form of civil disobedience, prompted institutional change. It inspired some CFGs to incorporate dissenting input into the decision-making process, enabling them to make more legitimate and enforceable decisions. Dewey's experimentalist model of democracy is superior to the DTA theorem in representing the values of universal inclusion and dynamic feedback as essential to the epistemic powers of democracy. Agarwal's case study shows how dissent works dynamically, not only to alter the content of democratic decisions, but decision-making procedures themselves. Women objected to both the content and process of exclusionary CFG decisions, and their dissent changed both. Dewey's experimental model captures precisely this dynamic interaction of outcome and process. Expressed dissatisfaction with outcomes prompts alteration in the procedures that lead to such unsatisfactory decisions.

Dewey's model of democracy helps us see how the CFGs' experiments in democratic reform can be profitably viewed as experiments in applied naturalized social, feminist epistemology. The question the CFGs' experiments are designed to answer is: how can democratic institutions be reformed so as to elicit and take advantage of women's situated knowledge, which is needed both to define and to solve problems of public interest? Public policies regulating community forests that are formed without taking advantage of women's situated knowledge are inefficient—they underutilize community resources, and develop resources (tree species) that are less useful to the community as a whole than alternatives. They are also inequitable, distributing benefits and burdens to the severe disadvantage of women. These facts generate a compelling case for democratic

reform to include women as equal participants in discussion. Such reform enhances the epistemic powers of CFGs, making them more responsive to women's situated knowledge. Epistemic improvement and democratic reform go hand-in-hand, just as Dewey's experimentalist model of democracy predicts. As naturalized epistemology is the application of scientific inquiry to improve inquiry itself, democratic reform is the application of experimental social epistemology to improve collective inquiry into the definition and solution of public problems.

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