

Electronic Rulemaking

A Public Participation Research Agenda for the Social Sciences

STUART W. SHULMAN

Drake University

DAVID SCHLOSBERG

Northern Arizona University

STEVE ZAVESTOSKI

University of San Francisco

DAVID COURARD-HAURI

Drake University

This article proposes a social science research agenda that will reflect on and inform the development of new information technology–based approaches to the electronic collection, distribution, synthesis, and analysis of public commentary in the regulatory rulemaking process. It identifies one critical area of an ongoing governance transformation: the use of web-based programs to collect public commentary on proposed agency rules. In the tradition of reflexive modernization, this article calls for deeper social science reflection during the development of a technological design in order to tap its democratic potential.

Keywords: e-rulemaking; environmental decision making; Internet; democracy; public participation; science; public values

Although the move to Internet-facilitated governance is accelerating, there is a dearth of political science and sociology research on the impact of the Internet on the administrative state (Fountain, 2001). Managers at the National Science Foundation’s Digital Government Program, in the Directorate for Computer and Information Science and Engineering, are encouraging social scientists to conduct basic research on the changes underway as information technology (IT) alters the citizen–government relationship. This article sets out some of the possible pathways for conducting research that “innovatively, effectively, and broadly address potential improvement of agency, interagency, and intergovernmental operations and government/citizen interaction” (National Science Foundation 2002).

One reason for looking at e-rulemaking is that it is a bridge from the first generation of government Internet use—providing information to the public—to the next generation: citi-

AUTHORS’ NOTE: This material is based on work supported by the National Science Foundation under Grant No. EIA-0089892, “Digital Government: SGER: Citizen Agenda-Setting in the Regulatory Process: Electronic Collection and Synthesis of Public Commentary.” Any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect those of the National Science Foundation.

Social Science Computer Review, Vol. 21 No. 2, Summer 2003 162-178

DOI: 10.1177/0894439303251557

© 2003 Sage Publications

zen to government commentary, and potentially citizen to citizen discourse, in the development of agency rules. Such a process offers unique opportunities for the public to engage in reflexive modernization (Beck, 1995, 1997, 1998; Beck, Giddens, & Lash, 1994; Giddens, 1990), that is, to introduce public discourse, values, and direction to the development of policy and the tools and methods used to create it. In addition, there are two broad issues that make the emerging use of e-rulemaking worthy of social science research.

First, there is the potential to examine and evaluate the growing practice of web-based public comment from the perspective of discursive democracy. This approach brings a number of important considerations to the study of this digital transformation, including issues of deliberation, diversity, respect, preference change, and the general expansion of discourse in the public sphere. Second, there is the potential for a better interface between environmental science and public values as a result of e-rulemaking. We call for greater exploration of the extent to which new mechanisms of public participation facilitate the integration of environmental science and public values in policy decision making.

BACKGROUND: FROM RULEMAKING TO E-RULEMAKING

The Administrative Procedures Act of 1946 was imbued with a number of democratic values, including the transparency of information, public participation, and the accountability of agencies (Kerwin, 1999). Regulatory rulemaking is a process designed to sort through facts and opinions derived from numerous sources; it is also a time- and information-intensive process, often requiring three or more years to complete (Johnson, 1998). In addition, agencies face the Administrative Procedures Act–mandated task of collecting and responding to public comment. This mandate provides one of the key access points used by the public, interest groups, movements, and diverse nongovernmental organizations. As Cornelius Kerwin (1999) noted, rulemaking offers “opportunities for dimensions of public participation that are rarely present in the deliberations of Congress or other legislatures” (p. 32).

During the past decade, numerous agencies have been moving toward electronic, web-based participation to meet the “notice and comment” requirements of the Administrative Procedures Act. For example, the U.S. Department of Agriculture broke new ground when the National Organic Program (NOP) conducted “the first fully electronic rule-making for a major regulation in federal history” (Friel, 1998), developing uniform rules for the production and marketing of organic food. As a result, NOP received the 1998 Government Technology Leadership Award for its innovative use of the Internet in public service. Although NOP was at first overwhelmed by the large number of comments submitted (more than 277,000), the sorting of public input and its delivery to relevant experts within the agency was enhanced (Shulman, in press; Zavestoski & Shulman, 2002). The U.S. Department of Agriculture cited increased public confidence in the agency as a primary benefit of the electronically enhanced rulemaking process. For facilitating maximum participation and creating the ability to view all other participants’ comments online, NOP received procedural praise from both supporters and opponents of the rule. At the introduction of a significantly revised proposed rule, the secretary of agriculture declared, “I do want to point out that the fact that we are once again announcing a proposed rule on national organic standards is a living example of our democracy at work” (Glickman, 2000).

Another recent e-rulemaking example is the public comment opportunities for the proposed roadless rule at the Department of the Interior. The Roadless Area Conservation Initiative originated in January 1998, when then–forest service chief Mike Dombeck proposed to

temporarily suspend road construction and reconstruction in most inventoried and adjacent roadless areas. After the development of an interim rule, the Forest Service moved to develop regulations that would provide appropriate long-term protection for inventoried roadless areas.

In 1999, the Forest Service issued a notice of intent to prepare a draft environmental impact statement. Following further public participation in its development, the Forest Service issued its proposed rule and draft environmental impact statement. The Forest Service posted the proposed rule, the considered alternatives, the background information, and a schedule of public meetings on its Roadless Area Conservation web site (roadless.fs.fed.us). In addition to 430 public meetings, the Forest Service also received more than 1 million postcards or other form letters and approximately 60,000 original letters, 90,000 e-mails, and several thousand faxes. However, the agency used the web only to give people information and limited its use of IT to allowing e-mail submissions; this contrasts sharply with the interactive format previously used by NOP.

Agencies such as Environmental Protection Agency (EPA), Department of Transportation, National Oceanic and Atmospheric Administration, Social Security Administration, National Research Council, and others have all attempted one form or another of electronic commenting in rulemaking processes. Congress recently passed an e-Government Act, which requires all federal agencies to begin conducting their rulemaking activities over the Internet, and the Office of Management and Budget rolled out a centralized portal (www.regulations.gov) for e-rulemaking (Office of Management and Budget, 2002) that will be managed by the EPA and will handle dockets for all rulemaking agencies. Many federal officials seem to agree with the General Accounting Office, which found that the "use of IT in regulatory management can reduce regulatory burden; improve the transparency of regulatory processes; and, ultimately, facilitate the accomplishment of regulatory objectives" (General Accounting Office, 2001, p. 1). Representatives of these agencies have participated in e-rulemaking workshops sponsored by the National Science Foundation, Drake University, and the Harvard University Kennedy School of Government in 2001, 2002, and 2003. At these workshops, agency representatives praised the cost-effectiveness and efficiency of their e-rulemaking systems while acknowledging the need for social science research into the process, impacts on public satisfaction with the agencies, and the final rulings themselves. There are, to date, few social science data evaluating the numerous issues involved in this transition.

OPTIMISTS, SKEPTICS, AND THE LURE OF REFLEXIVE MODERNIZATION

There is both optimism and pessimism regarding this transformation to e-government. A school of digital democrats has been praising the potential of local, national, and even global-scale town meetings brought to us by the technology. By the middle of the 1990s, it was clear the Internet would be the *de facto* standard for governments to get information to citizens (Noack, 1995, p. 29). Ever interested in the two-way exchange of views, as opposed to just one-way delivery of information, democratic theorists have focused on the potential of the Internet to increase citizen participation more broadly (Grossman, 1995; Hill & Hughes, 1998). Numerous scholars argue that web-based participation could be the answer to the decline in social capital and, so, interest in citizenship (Blumler & Coleman, 2001; Coleman & Gøtze, 2001).

There are, however, more skeptical analyses. Certainly, we cannot expect the new technology by itself to solve the problems of citizen interest and participation, as well as govern-

ment accountability and authenticity (Dawes, Bloniarz, Kelly, & Fletcher, 1999). A move to increased e-government brings up crucial issues regarding not only citizenship and representative government but also more specific questions about the quality of citizen input and the ability of agencies to manage potentially large increases in commentary. There are many who insist that the technology simply cannot address many of the key issues of democracy; Hern and Chauk (1997) argued the importance of challenging “the myth of cyberspace as the current pinnacle of real democracy, freedom and information exchange” (p. 36). Even on a straightforward issue such as increasing public oversight of agencies, some suggest that it is overly optimistic to assume that a technological change can lead to greater public control of the governmental agenda (Davis, 1999).

Others note that many forms of e-government have deprived the public of the potential of two-way, interactive deliberation on important policy issues. Rather than increasing democratic involvement, these critics note the very real possibility that the Internet could accelerate the fragmentation and disinterest of the public (Alexander & Pal, 1998; Schlosberg & Dryzek, 2002). After nearly a decade of online government, most agency use of the web remains a one-way provision of information, with no avenue for two-way interaction (Larsen & Rainie, 2002; West, 2001).

Finally, critics are concerned that digital government, rather than helping to bridge the digital divide, might actually widen the existing gap between the information and resource rich and poor (Malina, 1999; Toregas, 2001). Even the government’s own advisory panel notes this danger. The President’s Information Technology Advisory Committee warned that “we should use information technology to bridge the gaps in our society, not to create new ones” (President’s Information Technology Advisory Committee, 1999, p. 13). Still, despite all of these concerns regarding the potential perils of digital democracy, e-rulemaking is being rolled out with an air of inexorable momentum.

We argue that the potential is there for a reflexive design process that informs the move to e-rulemaking and electronic participation in democratic decision making more generally. The point of a theory and practice of reflexive modernity (see Beck et al., 1994) is that we no longer simply suffer the consequences of technological development as inevitable. Instead, we are urged to question the assumptions and implications of new technology and how it affects practices and relations in social, economic, and political relations. Beck (1997) argued that

reflexive modernization is the attempt to regain a voice and thus the ability to act, the attempt to regain reality in view of developments that are the consequences of the successes of modernization. These developments call the concepts and formulas of classical industrial society fundamentally into question from the inside, not from crisis, disintegration, revolution or conspiracy, but from the repercussions of the very ordinary “progress” on its own foundations. (p. 15)

We should be especially attentive when the technology is supposed to benefit democratic practice. Rather than become infatuated with the technology and its democratic potential, we should be careful to bring that technology under democratic control. We can examine, reflexively, how it might strengthen, rather than negate, a system of deliberative democracy. Use of the Internet as a mechanism of reflexive modernization could lead to an open and authentic mode of communication, an increase in the diversity of voices and respect for varying positions, and an expanded public sphere. Plurality of participation can be achieved, among other ways, by opening the discussion to modes of expression beyond those traditionally accepted. The Internet may be a more accepting mechanism of the forms of lay expression that are outside the realm of either scientific or legal argumentation. Personal narrative or moral urging,

for example, would weigh into deliberations on rulemaking. Such processes would lead to not only better and more reflective decision making but also increased legitimacy for, and trust in, the agencies.

As the National Research Council (2000) noted in its report *Making IT Better*, "IT is anything but a mature, stable technology" (p. 1). The challenge for researchers in this unsettled context is to assemble interdisciplinary teams capable of shaping IT and broader social or organizational dynamics into the most productive pathways.

Overwhelmingly, the most important opportunities lie in not simply automating existing applications, but rather in rethinking and remolding the structure and organization of the business process to reflect the best uses of IT and in redesigning and remolding the technology to make it most valuable in its (rethought) application context. (National Research Council 2000, p. 146)

One challenge is to pursue a vision that is long term and evolutionary in the face of demands for technical quick fixes to persistent information-management problems.

Building technical systems for social applications such as rulemaking requires that agencies and university researchers collaborate across the traditional stovepipe barriers, whether they lie between or within agencies or else among the academic disciplines. The social sciences can inform IT developers on questions of legitimacy and authenticity in the political process. There is also a need for researchers who understand the relationship between IT and organizational structures. According to the National Research Council (2000) report,

Nontraditional research mechanisms may be needed that will encourage the participation of end user organizations in research, broaden the outlook of IT researchers, and/or overcome disciplinary boundaries in universities. The management of interdisciplinary research collaborations generates its own set of issues: technologists and social scientists have different vocabularies, methodologies, time perspectives, standards of evidence, and so on. Such differences need to be bridged if collaborations are to be effective. (p. 168)

The potential is in open forums organized by groups in the public sphere and communicative exchanges with agencies in the development of this technology. To that end, a model of user and end user advisory boards may be the most appropriate method for engaging federal agencies and citizens. Advisory boards would involve experts working cooperatively to design IT applications aimed at making better public policy. But by including citizens, these applications would be ensured of involving the public in democratic decision making in new and expanded ways.

Therein is the possibility of an authentic and reflexive modernity—and the motivation for our proposed research agenda. Otherwise, the danger is a digital democracy that involves only symbolic participation, creates new divides between government and the governed, leaves out those on the underside of the digital divide, and generally undermines democratic authenticity. We now turn to two key issues ripe for reflection.

DISCURSIVE DEMOCRACY IN A DIGITAL ENVIRONMENT

The move to electronic participation in rulemaking has often been justified on economic grounds. The dominant value driving implementation of the technology, in these instances, is efficiency rather than democracy. Many agencies like the idea of electronic participation because it is a low-cost way to meet regulatory requirements for public comment. Dockets no

longer have to be housed in costly office space open to the public; they are kept in electronic storage for off-site perusal. When sued, agencies no longer have to spend hundreds of labor hours producing a docket of the decision-making process; courts are provided with electronic dockets simply by clicking Send.

Efficiency was only one of the values that led to the passage of the Administrative Procedures Act, but it was imbued with other values as well, including the transparency of information, public participation, and the accountability of agencies (Kerwin, 1999). Efficiency is not inherently undemocratic; however, an exclusive focus on efficiency can have a detrimental impact on the democratic process. For example, software designed to pass electronic submissions through data-mining tools and filters can efficiently send public comments to appropriate personnel in the agency. Here, the requirements of the Administrative Procedures Act are met with as little cost and time as possible. Even the most efficient programs offer only one-way communication (rather than space for discourse) and categorize comments by keywords (rather than being sensitive to the variety of positions, intentions, and meanings that citizens might have beyond those key words). With too much of an emphasis on efficiency, the potential of the technology is lost, the discursive range of the issue is limited, and the rich variety of kinds of communication in which humans engage is not recognized.

In the past decade or so, numerous political theorists have refocused on deliberation as a crucial aspect of democratic practice. Participants make proposals, attempt to persuade others, listen to the responses of those others, and determine the best outcomes and policies based on the arguments and reasons fleshed out in public discourse. Some democratic theorists (e.g., Bessette, 1980, 1994; Rawls, 1996) argue that deliberation and public reasoning already occur in current liberal democratic governments, legislatures, and/or courts; often, these theorists are content to stop there. However, most deliberative democrats (including Barber, 1984; Bohman, 1996; Dryzek, 1990, 2000; Young, 2000) insist on expanding the practice of discourse to the public deliberation of policy issues. There is a renewed interest in the place of discussion, reasoning, and engagement across lines of difference in democratic politics. As Dryzek (2000) said in his recent reflection on the past 10 years of deliberative democratic theory,

The essence of democracy itself is now widely taken to be deliberation, as opposed to voting, interest aggregation, constitutional rights, or even self-government. The deliberative turn represents a renewed concern with the authenticity of democracy: the degree to which democratic control is substantive rather than symbolic, and engaged by competent citizens. (p. 1)

A research agenda informed by a deliberative democracy perspective can examine the authenticity and legitimacy of the rulemaking process. Although the technological wave to be ridden is the digital one, the democratic wave, in both theory and political practice, is discourse. The underlying question is whether new electronic forms of participation offer more democratic legitimacy than traditional forms of comment. More specifically, deliberative democratic theory points to a number of important considerations in developing a research agenda:

1. Deliberation, not preference aggregation: In light of the deliberative turn in democratic thinking, it is important that citizens engage one another in reflecting on their preferences. When citizens simply send messages presenting a preference, as in one-way electronic participation, they participate in a form of aggregative democracy that leaves the mechanics of that aggregation to agency experts. There is no possibility of engaging with the position of others, and no space for reflection on one's own position. The EPA, for example, has a "de facto guideline" for two-way

communication (Covello & Allen, 1988), but it has rarely implemented the suggestions contained therein (see EPA, 2001; Schlosberg, 1999). In light of the focus on deliberation and authenticity in contemporary democratic thinking, an approach that exclusively seeks to aggregate opinion would constitute a giant step in the wrong direction. This is not to imply that existing procedures approach any ideal of deliberative authenticity, merely that if the new technology is not diverted away from mechanical aggregation, it will deplete any potentially beneficial deliberative aspects that do exist (Schlosberg & Dryzek, 2002).

2. Inclusion of difference: A more authentic discourse—and a more authentic democracy—includes the diversity of voices present in a society (and in particular those that are affected by the outcome of the deliberation). Deliberative democratic theory has paid particular attention to the issue of plurality of participation (Bohman, 1995; Dryzek, 1990; Hanson, 1985; Young, 1996). This inclusion takes a variety of forms. First, it means the equal participation of more individuals and groups in the development of policy. This is the essence of environmental justice demands for participation for traditionally excluded groups (Schlosberg, 2003). But it also means opening the discussion to modes of expression beyond those traditionally accepted. Young (1996, 2000) wanted to move beyond simply rational argumentation—which she sees as exclusive—to include other forms of communication. In terms of environmental decision making, this would mean giving value to participation that is outside the realm of either scientific or legal argumentation. Personal narrative or moral urging, for example, would weigh into deliberations on rulemaking.
3. Respect for a variety of positions: Linked to the above is the issue of respectful engagement in a discourse across differences. Deliberation is aimed not just at a singular outcome in terms of policy at the end but also at the understanding and mutual respect of participants in the process itself. As Benhabib (1992) argued, the emphasis is “on sustaining those normative practices and moral relationships within which reasoned agreement *as a way of life* can flourish and continue” (p. 38). Young (2000, pp. 24-25) noted that participants in democratic discussion listen to others, treat them with respect, make an effort to understand them by asking questions, and do not judge them too quickly. This calls on people to be able to understand the positions of the others with which they engage. Within this context, participants should develop arguments that ultimately are agreeable to those with different interests and ends (Bohman, 1995; Gutman & Thompson, 1996).
4. The transformation of preferences: Discursive democracy differs from standard liberal democracy in one key way, which is that preferences and interests are not brought into the conversation as in a battle—with one winning and others losing. The ideal of deliberation is that of communication that actually changes the preferences of participants in the face of the arguments and positions of others. In this way, a process of democratic rulemaking cannot just be one way, with either an agency’s positing a position for citizens to accept or that agency’s simply taking note of objections to proposed rules. There must be room in the design of the online procedure for individuals not only to deliberate with others but to note changes in their own position. Again, authenticity within deliberative democracy depends on participants’ affecting the outcome of the process; this, of course, includes the possibility of changes to proposed agency policy.
5. Expanding discourse in the public sphere: Digital democracy is a way of extending participation into civil society, beyond the electoral realm. But civil society contains not only individuals but groups. Many democratic theorists and practitioners recognize that broad and active associational life in civil society is central to the well-being of a strong democracy. Theorists of social capital such as Robert Putnam (2001) stress the role of nonpolitical groups in making people good citizens. More radical theorists emphasize social movements as key centers of democratic practice and education. The central question here is, What role is there for groups of any sort in a digital democracy? One virtue of electronic access to agency web sites is that access can be achieved by individuals without their participation in groups. This practice, however, might give people one less reason to join and support a group. We already see this problem on many major environmental organization web sites; action entails pushing a button to add one’s name to an electronic petition or sending an e-mail to a member of Congress. This sort of electronic action is isolated, one-way, and largely unreflective. Although Putnam’s thesis regarding bowling alone focuses on the value of social capital, a move to commenting alone depletes the political capital of a populace acting from a more and more often isolated position. No interchange or opportunity for questioning means little reflection and little practice in actually communicating and conversing with others. The potential result of such practices is a fur-

ther loss of democratic authenticity (Schlosberg & Dryzek, 2002). Digital democracy need not be inherently isolating, but it is a danger worth exploring.

6. Impact and authenticity: Of course, democratic processes are authentic only if those processes have an actual impact on the development and implementation of policy that affects people's lives. There are examples of inauthentic and co-opting mechanisms that only offer the veneer of democratic participation without the reality. Numerous theorists make clear the importance of authenticity as a measure of democratic process (Dryzek, 2000; Young, 2000). In addition, as noted above, many social theorists have discussed the importance of a reflexive modernization, wherein democratic processes are used to reflect on the impact of modernity. With respect to environmental issues, reflexivity is exercised toward the end of actively redirecting policy in less risky and more sustainable directions (Beck, 1995, 1998; Beck et al., 1994; Giddens, 1990). As a matter of practicality, there are numerous examples of democratic processes leading to both public acceptance of environmental risks and more positive opinions of agencies (Fischer, 2000; Williams & Matheny, 1995).

One of our central objectives is to examine the move to electronic participation using current theories and values of discursive democracy. We want to explore exactly what sort of democratic participation has been created by the move to electronic participation. We plan not to simply examine e-rulemaking from some ideal form of discursive democracy but to compare traditional forms of comment to electronic participation using the parameters of discursive democracy. Specific questions include the following:

- Is electronic participation one way or discursive?
- Given the digital divide, is participation more diverse or less diverse than past forms of public comment? Does digital democracy expand the franchise?
- Are some types of comment (e.g., legalistic or scientific) more acceptable to agencies than others (emotional, ideological, storytelling)?
- Do those who engage in e-rulemaking commentary show more respect for the positions of others than those who use traditional modes of comment?
- Do the preferences of citizens change as they are exposed to those of others in online commenting?
- Is electronic participation group based or isolating?
- Is participation authentic: Does it have an actual effect on rulemaking?

In Table 1, we have converted these questions into hypotheses with their corresponding theoretical justifications.

INTEGRATING PUBLIC VALUES AND SCIENTIFIC KNOWLEDGE

Another aim of social science research into e-rulemaking should be to determine the extent to which new Internet-based mechanisms of public participation facilitate the integration of scientific knowledge and public values in environmental decision making. Despite the wide variety of goals for involving the public in environmental decision making, in most cases, the challenge is to overcome the inherent conflicts between the ideals of healthy ecosystems, the science surrounding suggested policy, and the interests and values of various stakeholders. These conflicts typically play out in a public policy arena where scientific evidence underlies environmental decisions. This arena is often characterized by distrust and even hostile communication, which is a by-product of the adversarial stances of those involved.

When decisions emerge from such a context, a distrustful public may issue challenges, which leads to implementation delays, protracted litigation, and enforcement problems. Increasingly, challenges are issued by underrepresented individuals and groups who feel

TABLE 1
Discursive Democracy: Hypotheses and Theoretical Bases

<i>Hypothesis</i>	<i>Theoretical Basis</i>
Participation in electronic rulemaking is more discursive than traditional forms of comment.	The trend in democratic theory is toward more discourse and deliberation (Dryzek, 2000); online discussions may actualize this trend.
Electronic participation is more diverse, demographically, than traditional forms of comment.	There is a digital divide, but electronic comment may offer more access to participation than exists now.
Software for electronic participation in rulemaking privileges scientific and legalistic comments more than other forms of comment.	Only certain forms of comment are acceptable and incorporated in much democratic deliberation (Young, 1996).
Electronic participants show more respect toward other opinions than participants in traditional forms of comment.	Democratic discourse engenders respect (Benhabib, 1992; Young, 2000).
Citizen preferences change more after citizen participation in electronic comment than in traditional comment.	Democratic discourse engenders reflection on one's positions and preferences (Bohman, 1996).
Citizens using electronic means of participation are more likely to comment in isolation, whereas those using traditional means are more likely to comment from within interest groups.	Democracy is as much about groups as about individual participation (Dryzek, 2000; Putnam, 2001).
Electronic commentary is incorporated into revised rules	Democratic processes must be authentic to be valid (Dryzek, 2000).

excluded from the decision-making process. To the extent these instances are a clash of public values and scientific knowledge, one possible key to overcoming conflict is a public participation process that effectively integrates scientific knowledge and public values. Yet currently, it is uncertain whether Internet-based public participation facilitates such a process.

One focus of public participation is to introduce public values into the traditionally science-based environmental decision-making process. The move toward more public participation in the past 20 years is often justified as a response to the shortcomings of the science of risk assessment in which scientific experts rationally arrive at policy recommendations by using quantitative analysis to weigh risks against each other and against the cost of regulation. The goal of this effort is to allow agencies to focus limited resources on the most significant risks (Ames, Magaw, & Gold, 1987; Graham & Wiener, 1995; Tengs et al., 1995). Critics contend this has the effect of removing public values from the decision-making process. Public participation, then, is a way to bring public values back in.

For policy makers and agency personnel, however, simply involving public values for their own sake is problematic. As regulatory officials often see it, the public's values are uninformed by the relevant science. Because some citizens are poorly informed about risk, their preferences are perceived to be susceptible to biases. Limiting risk decisions to councils of experts insulated from public opinion, however, does not necessarily serve the objective of risk minimization (not to mention democracy or reflexive modernization). Comparative risk studies tend to overemphasize point estimates and underemphasize the experimental uncertainty (Byrd & Cothorn, 2000). Experts are not immune to overconfidence and underestimation of error (Henrion & Fischhoff, 1986). Many decisions regarding risk, while appearing more rational, are highly subjective (Montague, 1999; O'Brien, 2000). As Kammen and

Hassenzahl (1999) pointed out, "Since decisions about values and preferences are made not just at the final decision stages, but throughout the risk assessment process, risk analysis necessarily combines both technical expertise and value choices" (p. 11). Whether or not they are based on science, and no matter where that science comes from, value choices are essential to democratic decision making. As Kleinman (1998) argued, the inability of laypeople to comprehend the complexities of the production of scientific knowledge is insufficient grounds for the exclusion of lay perspectives.

In an environment in which public trust of government officials and scientific experts at times appears to have broken down, and where policy makers and agency personnel distrust citizen input, the public is unlikely to accept scientific justifications for a decision. This relationship results in what Renn (1995) described as an adversarial style of policy making in the United States. Under an adversarial regime, policy makers anticipate objections to their decisions, so they compile as much scientific evidence as possible in support of their position. In this mode of decision making, citizens are not involved in the production of science. But as long as citizens know they can challenge a decision on the grounds that its scientific basis is flawed, no amount of evidence will be sufficient. In essence, citizens learn to use the strategy of continually calling for more scientific evidence with greater levels of certainty before risks are taken.

In fact, such an environment often results in lay activists' using science to their own advantage, either by producing their own science or by pointing out the absence of sufficient science to justify a decision or the potential biases in existing science. This type of strategizing tends to place minority communities at a disadvantage because they often lack the economic and social capital necessary to engage and challenge the science. When they do obtain scientific knowledge, they tend to be dismissed even more readily than other lay activists. These factors make it important to understand whether the Internet can serve to integrate public values with scientific understanding. To the extent that it can, minorities and others whose voices are often left out of environmental decision-making processes may be able to participate more meaningfully in such decision making.

The daunting challenge, then, is to promote better cross-fertilization of scientific knowledge and public values. Experienced policy makers and analysts cite two main reasons why this rarely occurs. First, policy makers have been unable to develop a reliable method of incorporating public values into rational scientific grounds for decision making. Second, lay citizens are typically not able to understand some of the sophisticated scientific evidence relevant to a decision without a certain amount of education (Fischer, 2000).

One approach to overcoming this situation is to educate citizens about the production of scientific knowledge and to expose them to a range of accessible scientific information. The scientifically informed value orientations of citizens can, in turn, more easily be incorporated into environmental decisions. Presumably, the commitment to public participation in environmental decision making has two goals: to produce a more educated public that can participate in meaningful ways and to create a government that is more aware of public values. In theory, having participated meaningfully, citizens will perceive the decision-making process as fair and just and be more likely to accept the final decision, which is more likely to be a reflection of their interests. In turn, citizen trust in government is restored.

Determining whether Internet-based public participation facilitates such a process requires social science research. Specific questions needing to be answered include the following:

- Does making science available over the Internet result in more scientifically based public comment?

- Are citizens more likely to offer value-based justifications when commenting via the web?
- Do citizens who participate in Internet-based comment perceive that their interests and values are represented in the final decisions?
- Are rules that incorporate electronic public comments more or less likely to reflect public values in addition to science?
- Do citizens who participate in Internet-based public comment periods end up trusting agencies more?

In the interest of building a research agenda, we transform these questions into hypotheses and offer theoretical justifications for them in Table 2.

APPROACH AND METHOD

Our observations of the two previously described rulemaking cases suggest that public participation in environmental decision making is a good place to begin exploring answers to the above questions. First, it is an area of public policy where public interest and participation are quite high. Andrews (1999), in his history of U.S. environmental policy, argued that “one of the most distinctive features of modern U.S. environmental protection policy . . . is the unprecedentedly broad right of access to the regulatory process, which extends not only to affected businesses but to citizens advocating environmental protection” (p. 240). Rosenbaum (1989) noted that more than 75% of all public participation programs in the United States originated in federal statutes since 1970 and that the vast majority of those are in environmental legislation (p. 215). Paehlke (1989) argued that in the past three decades, the environmental area has led all others in the scope and extent of democratic innovation not just in legislative politics but also in environmental administration and law. Such innovations include public inquiries, right-to-know legislation, alternative dispute resolution, advisory committees, and policy dialogues. In environmental policy, then, there has developed a culture of participation.

Second, and not surprisingly, environmental issues have been central in the development of web-based public comment. As noted earlier, two of the major uses of the technology have been in the environmental arena—the U.S. Department of Agriculture’s proposed rules for organic foods and the Forest Service’s proposed Roadless Area Conservation Ruling. In addition, in December 2001, the EPA brought a new system online, the EPA Dockets or “EDOCKETS” system, which allows citizens to search for and comment on any open proposed rule. All of this demonstrates that environmental issues are central in both public participation and this transition to electronic rulemaking.

Hence, we propose a study of rulemaking on environmental issues. Data for such a study come from at least three different rulemaking cases and would include the citizen comments themselves as well as survey data from a survey of citizens who commented on the proposed rulings. The selection of cases would be aimed at facilitating a comparison of traditionally submitted comments to electronically submitted comments in cases where the Internet was used as both an information-dissemination and collection tool. Selection criteria would focus on achieving a level of geographical and issue diversity to determine if the hypotheses might hold better in some rulemaking contexts than others. For example, the rulemaking and political cultures of some agencies might make their use of electronic commenting more useful than it would be for other agencies. Below, we describe the potential usefulness of citizen comments and survey data as well as two types of data that could be useful.

Citizen comments. In submitting formal comments on proposed rulings, citizens have traditionally had two options: sending letters and providing testimony at public hearings. With

TABLE 2
Public Values and Scientific Knowledge: Hypotheses and Theoretical Bases

<i>Hypothesis</i>	<i>Theoretical Basis</i>
Making scientific information for a proposed rule available to the public over the Internet results in more scientifically informed public comments.	The public gets excluded from decision making because of its lack of scientific understanding. A scientifically literate public is more valuable to agency officials (Tesh, 2000).
Citizens are more likely to offer value-based justifications for a position on a ruling when commenting over the Internet.	Regular participants learn the value of scientifically based comments. New participants commenting over the Internet will more freely offer value-based justifications for their views (Hill & Hughes, 1998).
Citizens who participate in Internet-based public comment periods are more likely to perceive the decision-making process as fair and to report their interests were adequately represented in the final decision.	Citizens object when decision-making processes appear unfair or their interests are not represented. Internet-based commenting increases perceived fairness because of ease of participating and a sense that the decision-making playing field is level (Aikens, 1999).
Citizens who participate in Internet-based public comment periods are more likely to report higher levels of trust in agencies than are traditional commenters.	Document access and procedural transparency reduce the sense that decisions are made behind closed doors (Dawes, Bloniarz, Kelly, & Fletcher, 1999).
Final rulings that incorporate electronic comments in addition to traditional comments are more likely to reflect public values.	Expanding the options for participation encourages a diversity of voices, including those not typically part of decision-making processes (General Accounting Office, 2001; President's Information Technology Advisory Committee, 1999).
Final rulings that incorporate electronic comments and reflect public values are less likely to undergo litigation.	Citizens will litigate unless a decision appears consistent with their values, regardless of the science (Johnson, 1998).

the advent of the Internet, not only have agencies allowed comments to be submitted via e-mail or through agency web pages; they have also made full dockets available online. Agencies also continue to collect public comments through a variety of more traditional mechanisms: public hearings, faxes, and letters. Electronically submitted comments can be easily compared to comments submitted through the mail or by fax using qualitative data analysis software, such as Atlas.ti or NVivo.

Survey of citizen commenters. A telephone survey could reveal similarities and differences between individuals who elect to make public comments using Internet technology and those who comment using traditional communication mechanisms. A sampling frame for the survey could be derived from the contact information provided in most letters, faxes, and e-mails. Such a sampling strategy would also allow comparisons across traditional and electronic comments with respect to variables such as those associated with discursive democracy, the incorporation of values and scientific knowledge into citizen comments, and satisfaction with a ruling's outcome and the agencies involved.

Interviews with agency personnel involved in the selected rulings. Measuring the outcomes of public participation processes is always difficult. Interviews with agency personnel

who were involved in each of the rulings could generate rich qualitative accounts of how the public participation process works. This will also reveal whether citizens and agency personnel share views on the public participation process. Interviewees could include agency rule writers, community relations staff, legal counsel, and relevant scientific experts.

Agency and media records of the final rulings. Collecting and analyzing official agency reports on the results of rulemaking processes could supplement the individual accounts derived from interviews. Much can be gleaned about the rulemaking process from the final rules with their legally mandated preambles (at times longer than the rules themselves).

This approach of combining qualitative and quantitative methodologies promises a robust approach to the research (Fielding & Schreier, 2001). Combining these methods offers the benefit of a research design in which the nuances of behaviors (e.g., commenting) and attitudes can be observed. The public nature of citizen comments provides the perfect opportunity to both perform content analysis of comments and randomly survey those same commenters.

A SOCIAL SCIENCE AGENDA FOR E-RULEMAKING

We see benefits of this proposed research both in terms of governmental policy and processes and in terms of empirical support for disciplinary and interdisciplinary arguments. Many government agencies have already committed substantial resources to the electronic collection and synthesis of public commentary during rulemaking. At the same time, agencies such as EPA are increasingly committed to environmental decision-making processes that not only involve the public in a more discursive manner but also more efficiently integrate scientific knowledge with public values. The proposed research could provide significant evidence as to whether current uses of the Internet as a public participation mechanism are expanding democratic practice and agency legitimacy. In addition, the richness of the multiple types of data we recommend collecting should lead to an understanding of how the Internet can be more effectively used toward the end of integrating scientific knowledge and public values in environmental decision making. Such findings will provide key information for agencies that bring e-rulemaking systems online in the future and help agencies with existing systems meet their public participation and legitimation goals more quickly.

Given the dearth of finely grained, systematic qualitative data with respect to Internet-based public participation in regulatory rulemaking, the findings from this research can serve as guideposts for the ongoing and future development of e-rulemaking practices and related research endeavors. A better understanding of the factors that influence participation and satisfaction with outcomes, as well as the potential of the Internet to shape these factors, will be invaluable to policy makers, agencies, and ultimately citizens as well.

A significant body of research is emerging in the area of public participation in environmental decision making (cf. Fischer, 2000). To date, absent from this literature is any research investigating Internet-based public participation mechanisms. This research will expand our existing knowledge of public participation in federal rulemaking processes. It will also offer insights into democratic deliberation more broadly and lead to a better understanding of whether Internet-based public participation has the ability to overcome the inability of current participation mechanisms to engage citizens discursively and integrate scientific knowledge and public values. Finally, the proposed research stands to make broader contributions to the disciplines of political science, public administration, and sociology. Some political theorists argue that truly deliberative democracies are necessary to

overcome the adversarial tendency of policy making (Dryzek, 2000; Williams & Matheny, 1995). The research agenda we lay out will provide an empirical test of whether the increased deliberation the Internet affords does indeed diminish the conflict and distrust prominent in most policy-making processes. Such research will also provide insight into the possibility of the Internet and participation in e-rulemaking as a tool for a more citizen-based, reflexive modernization as well.

Solutions to environmental problems are dependent on the science underlying the problem, the local political environment and the decision-making strategies it employs, and the cultural traditions and strategies of participation it suggests. The best approach to solving environmental problems, then, is to implement environmental decision-making processes that can accommodate the variation of these characteristics from one environmental problem to another. To the extent that the Internet can provide a flexible and adaptable mechanism of public participation, it may hold the potential to serve as the infrastructure that can facilitate the unique and culturally specific processes that will arrive at solutions to environmental problems. Pursuing the research agenda we have described will be vital in determining whether such potential is being, or can be, realized. In the meantime, we aim to bring elements of the ongoing transition to e-governance more thoroughly into academic discussion as one element of reflexive modernization.

REFERENCES

- Aikens, G. S. (1999). Deweyan systems in the information age. In B. N. Hague & B. D. Loader (Eds.), *Digital democracy: Discourse and decision making in the information age* (pp. 179-194). New York: Routledge.
- Alexander, C. J., & Pal, L. A. (1998). Introduction: New currents in politics and policy. In C. J. Alexander & L. A. Pal (Eds.), *Digital democracy: Policy and politics in the wired world* (pp. 2-22). Don Mills, Canada: Oxford University Press.
- Ames, B. N., Magaw, R., & Gold, L. S. (1987). Ranking possible carcinogenic hazards. *Science*, 236, 271-280.
- Andrews, R. N. L. (1999). *Managing the environment, managing ourselves: A history of American environmental policy*. New Haven, CT: Yale University Press.
- Barber, B. (1984). *Strong democracy: Participatory politics for a new age*. Berkeley: University of California Press.
- Beck, U. (1995). *Ecological enlightenment* (M. A. Ritter, Trans.). Atlantic Highlands, NJ: Humanities Press.
- Beck, U. (1997). *The reinvention of politics: Rethinking modernity in the global social order* (M. A. Ritter, Trans.). Cambridge, UK: Polity.
- Beck, U. (1998). *Democracy without enemies* (M. A. Ritter, Trans.). Cambridge, UK: Polity.
- Beck, U., Giddens, A., & Lash, S. (1994). *Reflexive modernization: Politics, tradition and aesthetics in the modern social order*. Stanford, CA: Stanford University Press.
- Benhabib, S. (1992). *Situating the self: Gender, community and postmodernism in contemporary ethics*. New York: Routledge.
- Bessette, J. M. (1980). Deliberative democracy: The majoritarian principle in republican government. In R. A. Goldwin & W. A. Shamba (Eds.), *How democratic is the constitution?* (pp. 102-116). Washington, DC: American Enterprise Institute.
- Bessette, J. M. (1994). *The mild voice of reason: Deliberative democracy and American national government*. Chicago: University of Chicago Press.
- Blumler, J. G., & Coleman, S. (2001). *Realising democracy online: A civic commons in cyberspace*. London: IPPR.
- Bohman, J. (1995). Public reason and cultural pluralism: Political liberalism and the problem of moral conflict. *Political Theory*, 23, 253-279.
- Bohman, J. (1996). *Public deliberation: Pluralism, complexity and democracy*. Cambridge, MA: MIT Press.
- Byrd, D. M., & Cothorn, R. (2000). *Introduction to risk analysis*. Rockville, MD: Government Institutes.
- Coleman, S., & Götze, J. (2001). *Bowling together: Online public engagement in policy deliberation*. London: Hansard Society. Retrieved July 24, 2002, from <http://www.hansardsociety.org.uk/bowling.pdf>
- Covello, V., & Allen, F. (1988). *Seven cardinal rules of risk communication*. Washington, DC: Environmental Protection Agency.

- Davis, R. (1999). *The web of politics: The Internet's impact on the American political system*. New York: Oxford University Press.
- Dawes, S. S., Bloniarz, P. A., Kelly, K. L., & Fletcher, P. D. (1999). *Some assembly required: Building a digital government for the 21st century*. Retrieved January 14, 2000, from <http://www.ctg.albany.edu/resources/rptwplst.html>
- Dryzek, J. S. (1990). *Discursive democracy: Politics, policy, and political science*. New York: Cambridge University Press.
- Dryzek, J. S. (2000). *Deliberative democracy and beyond: Liberals, critics, contestations*. Oxford, UK: Oxford University Press.
- Environmental Protection Agency. (2001). *Stakeholder involvement & public participation at the U.S. EPA: Lessons learned, barriers, & innovative approaches* (Office of Policy, Economics, and Innovation Number EPA-100-R-00-040). Retrieved July 29, 2002, from <http://www.epa.gov/publicinvolvement/pdf/sipp.pdf>
- Fielding, N., & Schreier, M. (2001). Introduction: On the compatibility between qualitative and quantitative research methods. *Forum Qualitative Sozialforschung/Forum: Qualitative Social Research*, 2(1). Retrieved May 5, 2002, from <http://qualitative-research.net/fqs/fqs-eng.htm>
- Fischer, F. (2000). *Citizens, experts, and the environment: The politics of local knowledge*. Durham, NC: Duke University Press.
- Fountain, J. (2001). *Building the virtual state: Information technology and institutional change*. Washington, DC: Brookings Institution.
- Friel, B. (1998). *Real world results*. Retrieved November 5, 1999, from <http://govexec.com/tech/techawrd/98awards.htm>
- General Accounting Office. (2001). *Regulatory management: Communication about technology-based innovations can be improved* (GAO-01-232). Washington, DC: Government Printing Office.
- Giddens, A. (1990). *The consequences of modernity*. Cambridge, UK: Polity Press.
- Glickman, D. (2000). *National organic standards remarks as prepared for delivery by Secretary of Agriculture Dan Glickman Washington, DC—March 7, 2000*. Retrieved June 18, 2000, from <http://www.ams.usda.gov:80/nop/glickman.htm>
- Graham, J. D., & Wiener, J. B. (1995). *Risk vs. risk*. Cambridge, MA: Harvard University Press.
- Grossman, L. K. (1995). *The electronic republic: Reshaping democracy in the information age*. New York: Viking.
- Gutman, A., & Thompson, D. (1996). *Democracy and disagreement*. Cambridge, MA: Harvard University Press.
- Hanson, R. L. (1985). *The democratic imagination in America: Conversations with our past*. Princeton, NJ: Princeton University Press.
- Henion, M., & Fischhoff, B. (1986). Assessing uncertainty in physical constants. *American Journal of Physics*, 54, 791-798.
- Hern, M., & Chauk, S. (1997). The Internet, democracy and community: another.big.lie. *Journal of Family Life*, 3, 36-39.
- Hill, K. A., & Hughes, J. E. (1998). *Cyberpolitics: Citizen activism in the age of the Internet*. Lanham, MD: Rowman & Littlefield.
- Johnson, S. M. (1998). The Internet changes everything: Revolutionizing public participation and access to government information through the Internet. *Administrative Law Review*, 50, 277-337.
- Kammen, D. M., & Hassenzahl, D. M. (1999). *Should we risk it? Exploring environmental health and technological problem solving*. Princeton, NJ: Princeton University Press.
- Kerwin, C. M. (1999). *Rulemaking: How government agencies write law and make policy* (2nd ed.). Washington, DC: CQ Press.
- Kleinman, D. L. (1998). Beyond the science wars: Contemplating the democratization of science. *Politics and the Life Sciences*, 17, 133-145.
- Larsen, E., & Rainie, L. (2002). *The rise of the e-citizen: How people use government agencies' web sites*. Retrieved May 5, 2002, from http://www.pewinternet.org/reports/pdfs/PIP_Govt_Website_Rpt.pdf
- Malina, A. (1999). Perspectives on citizen democratisation and alienation in the virtual public sphere. In B. N. Hague & B. D. Loader (Eds.), *Digital democracy: Discourse and decision making in the information age* (pp. 23-38). New York: Routledge.
- Montague, P. (1999). The waning days of risk assessment. *Rachel's Environment and Health News*, 652. Retrieved June 2, 2001, from http://www.rachel.org/home_eng.htm
- National Research Council. (2000). *Making IT better: Expanding information technology research to meet society's needs*. Washington, DC: National Academy Press.
- National Science Foundation. (2002). Digital government—program scope. Retrieved September 6, 2002, from <http://www.interact.nsf.gov/cise/descriptions.nsf/pd/dg?OpenDocument>

- Noack, D. R. (1995). Of, by, and for the people. *Internet World*, 6, 28-31.
- O'Brien, M. (2000). *Making better environmental decisions: An alternative to risk assessment*. Cambridge, MA: MIT Press.
- Office of Management and Budget. (2002). *OMB accelerates effort to open federal regulatory process to citizens and small businesses* (OMB 2002-27). Available from <http://www.whitehouse.gov/omb/pubpress/2002-27.pdf>
- Paehlke, R. (1989). *Environmentalism and the future of progressive politics*. New Haven, CT: Yale University Press.
- President's Information Technology Advisory Committee. (1999). *Information technology research: Investing in our future*. Retrieved January 14, 2000, from <http://www.ccic.gov/ac/report/>
- Putnam, R. (2001). *Bowling alone: The collapse and renewal of American community*. New York: Simon & Schuster.
- Rawls, J. (1996). *Political liberalism*. New York: Columbia University Press.
- Renn, O. (1995). Style of using scientific expertise: A comparative framework. *Science and Public Policy*, 22(3), 147-156.
- Rosenbaum, W. (1989). The bureaucracy and environmental policy. In J. P. Lester (Ed.), *Environmental politics and policy: Theories and evidence*. Durham, NC: Duke University Press.
- Schlosberg, D. (1999). *Environmental justice and the new pluralism*. Oxford, UK: Oxford University Press.
- Schlosberg, D. (2003). The justice of environmental justice: Reconciling equity, recognition, and participation in a political movement. In A. Light & A. deShalit (Eds.), *Moral and political reasoning in environmental practice*. Cambridge, MA: MIT Press.
- Schlosberg, D., & Dryzek, J. S. (2002). Digital democracy: Authentic or virtual? *Organization and Environment*, 15, 327-330.
- Shulman, S. W. (in press). An experiment in digital government at the United States National Organic Program. *Agriculture and Human Values*.
- Tengs, T. O., Adams, M. E., Pliskin, J. S., Safran, D. G., Siegel, J. E., Weinstein, M. C., et al. (1995). Five-hundred life-saving interventions and their cost-effectiveness. *Risk Analysis*, 15, 369-390.
- Tesh, S. N. (2000). *Uncertain hazards: Environmental activists and scientific proof*. Ithaca, NY: Cornell University Press.
- Toregas, C. (2001). The politics of e-gov: The upcoming struggle for redefining civic engagement. *National Civic Review*, 90, 235-240.
- West, D. M. (2001). *State and federal e-government in the United States, 2001*. Retrieved May 5, 2002, from http://www.brown.edu/Departments/Taubman_Center/polreports/egovt01us.html
- Williams, B. A., & Matheny, A. R. (1995). *Democracy, dialogue, and environmental disputes: The contested languages of social regulation*. New Haven, CT: Yale University Press.
- Young, I. M. (1996). Communication and the other: Beyond deliberative democracy. In S. Benhabib (Ed.), *Democracy and difference: Contesting the boundaries of the political*. Princeton, NJ: Princeton University Press.
- Young, I. M. (2000). *Inclusion and democracy*. Oxford, UK: Oxford University Press.
- Zavestoski, S., & Shulman, S. W. (2002). The Internet and environmental decision-making. *Organization and Environment*, 15, 323-327.

Stuart W. Shulman is an assistant professor of environmental science and policy at Drake University. He is the principal investigator on an National Science Foundation-funded project titled Digital Citizenship: Expanding Information Technology Literacy With a Service-Learning Approach. Dr. Shulman is collaborating with several federal agencies to assess the impact of e-rulemaking. He leads yearly summer study seminars in Washington D.C. that bring undergraduates to federal agencies to discuss the administrative process.

David Schlosberg is an associate professor of political science at Northern Arizona University, where he teaches political theory and environmental politics. He is the author of Environmental Justice and the New Pluralism (1999, Oxford) and coauthor of Green States and Social Movements: Environmentalism in the United States, Britain, Germany, and Norway (2003, Oxford).

Steve Zavestoski is an assistant professor of sociology at the University of San Francisco. His current research examines the role of science in disputes over the environmental causes of unexplained illnesses and the use of the Internet as a tool for enhancing public participation in federal environmental rulemaking. His work appears in journals such as Science, Technology & Human Values, Journal of Health and Social

Behavior, and Sociology of Health and Illness and in the book Sustainable Consumption: Conceptual Issues and Policy Problems (2001, Elsevier).

David Courard-Hauri is an assistant professor of environmental science and policy at Drake University. He is the principal investigator on a NASA-funded grant to develop a method for the automatic generation of dynamic models from time-series data, and he is interested in the numerical assessment of policy-relevant environmental questions.