Four Perspectives on Public Participation Process in Environmental Assessment and Decision Making: Combined Results from 10 Case Studies

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Abstract

Knowing how people think about public participation processes and knowing what people want from these processes is essential to crafting a legitimate and effective process and delivering a program that is widely viewed as meaningful and successful. This article reports on research to investigate the nature of diversity among participants' perceptions of what is the most appropriate public participation process for environmental assessment and decision making in 10 different cases. Results show that there are clearly distinct perspectives on what an appropriate public participation process should be. We identified four perspectives: Science-Centered Stakeholder Consultation, Egalitarian Deliberation, Efficient Cooperation, and Informed Collaboration. The literature on public participation tends to presume that there are clear and universal criteria on how to "do" public participation correctly or that context is the critical factor. This study has revealed that even within a specific assessment or decision-making effort, there may be different perspectives about what is viewed as appropriate, which poses a challenge for both theorists and practitioners. Among the active participants in these 10 case studies, we found limited agreement and strong differences of opinions for what is a good process. Points of consensus across these cases are that good processes reach out to all stakeholders, share information openly and readily, engage people in meaningful interaction, and attempt to satisfy multiple interest positions. Differences appeared about how strongly to emphasize science and information, how much leadership and direction the process needs, what is the proper behavior of participants, how to tackle issues of power and trust, and what are the outcome-related goals of the process. These results challenge researchers and practitioners to consider the diversity of participant needs in addition to the broad context when conceptualizing or carrying out participatory processes.

Introduction

Efforts to better public participation in environmental assessment and decision making have beaten a well-worn path. Legislation has provided mandates for public participation, including the National Environmental Policy Act and the Federal Advisory Committee Act. Federal and state agencies have integrated goals and procedures for public participation into policy statements (e.g., Department of Energy [DOE], 2003; Environmental Protection Agency [EPA],

2003; National Park Service [NPS], 2003) that parallel guidance proposed by many practitioners and researchers. Meanwhile, the development of procedures to involve stakeholders and citizens continues to progress (Gastil & Levine, 2005; Koontz, Carmin, Steelman, & Thomas, 2004; Sabatier, 2005). A burgeoning case study literature is rich with suggestions of what has worked, what has not, and why (Ashford & Rest, 1999; Beierle & Cayford, 2002). In addition, the theoretical literature associated with public participation evaluation has been growing (Bradbury, Branch, & Malone, 2003; Daniels & Walker, 2001; Forss, 2005; Frewer & Rowe, 2005; Leach, Pelkey, & Sabatier, 2002; National Research Council, 1996; Rowe & Frewer, 2000; Shindler & Neburka, 1997; Webler, 1995; Webler & Tuler, 2000). And there have been very specific proposals for practice (Creighton, 2005).

At the same time, planners are often exhorted to match process design with the problem or the context (Rosener, 1978). But there is little tested guidance about how to actually do this or what it even means and there may be tension among goals or proposed designs. In previous work we have found that while people often agree in the abstract about particular goals of design features, such as fairness, access, and competence, they may also emphasize them differently (Tuler, Webler, & Finson, 2005; Tuler & Webler, in press; Webler, Tuler, & Krueger, 2001; Webler, Tuler, & Tanguay, 2004). Furthermore, much of the guidance is too general to provide the more nuanced advice necessary for specific cases. In fact, even within a specific assessment or decision-making effort there may be different perspectives about what is viewed as appropriate, which poses a challenge for both theorists and practitioners. Knowing how people think about public participation and knowing what people want from public participation is essential to crafting a legitimate and effective process and delivering a program that is widely viewed as meaningful and successful.

This article reports on research to investigate the nature of the diversity among participants' perceptions of what is the most appropriate public participation process in a pooled analysis of 10 different processes. We brought to this study a conceptualization of public participation based on prior theoretical and empirical work in policy areas of forest and watershed management (Tuler & Webler, 1999; Webler et al., 2001; Webler & Tuler, 2001). That work produced a number of concepts or categories important to understanding and describing public participation; this work provided a foundation for these additional case studies and the analysis presented here. Our pooled analysis is one component of a larger study on public participation, in which we wanted to investigate the similarities and differences among participants' preferences for process features and whether there are any patterns among who prefers particular features, including individual characteristics, participation in a particular policy arena, and preferences for particular kinds of outcomes.

In this article we begin with a brief overview of the 10 processes we used in our study then explain our methods, present the results, and compare them with key themes relevant to theory and practical guidance. Finally, we reflect on the

implications of our findings for theory and practice, with a focus on the ways that each need to accommodate the diversity of views that may exist within a single context about what are appropriate features for a process.

Case Studies

Our goal was to learn about how people think about process in different kinds of contexts, rather than focusing on a specific context, defined by policy arena, level of conflict and trust, representation of stakeholders, type of process design (e.g., advisory board), etc. Thus, we selected case studies in three different policy arenas: watershed management, forestry management, and radiation hazard management. Initially, we selected three in each policy arena. We also completed a pilot study of a planning process for the Boston Harbor Islands National Park Area; because this case study was successful we have included it in our full set of case studies as a watershed planning process (Webler et al., 2004). We selected these three policy arenas because: they are arenas in which deliberative approaches to planning have received much attention, there exist a variety of innovative approaches to public participation in each area (and a vast set of published cases studies), and because they present impacts on value dimensions that are diverse, unequally distributed, and important to affected individuals.

The selection of specific cases was guided by several criteria:

- the issue of how the process should operate was discussed as part of the process;

- there was rich public participation (unusual and nonroutine);

- the five characteristics for which broadly based deliberative processes are appropriate to guide and interpret scientific analysis (Dietz & Stern, 1998) were present: multi-dimensionality, scientific uncertainty, value conflict and uncertainty, mistrust, and urgency;

- a diverse range of interests were involved, including unorganized citizens as well as interest groups;

- enough people were willing to be studied;

- there was an existing body of research and gray literature describing and/or assessing the case; and

- the case was recently finished or well underway.

Briefly, the 10 cases were:

1. *Forest management in the Finger Lakes National Forest (NY).* An ongoing process begun in 1998 to bring together citizens and stakeholders to identify issues for consideration in a revision of the forest management plan and also to resolve conflicts about trail use, land use management, and habitat management.

2. *Forest management in the Applegate region (OR)*. An ongoing project, begun in the early 1990s, to address forest planning issues in the Applegate region of southern Oregon is based within the Applegate Partnership. It has included a rich diversity of public participation opportunities.

3. *Forest management in the greater Flagstaff region (AZ)*. An ongoing effort of diverse stakeholders to address forest management issues in the Flagstaff region, including wildfire planning, is centered within the Greater Flagstaff Forests Partnership. It was established under a cooperative agreement with the U.S. Forest Service. An Advisory Council provides recommendations to the Forest Service and it plans and assesses field experiments and technical studies to inform decision making.

4. *Morro Bay National Estuary Program (CA)*. Located near San Louis Obispo, this project is funded by the EPA National Estuary Program. It is a consensus-based approach that draws on citizens as well as stakeholder groups to participate in drawing up a management plan for the estuary.

5. *Dungeness River Management (WA)*. A Dungeness River Management Team, established by the Clallam County Board of Commissioners and the Jamestown S'Klallam Tribal Council, has addressed a variety of water quality and water quantity issues arising from this river located in the Olympic Peninsula. The team includes participants from diverse stakeholders and state, county, and local governments.

6. *Raritan Basin Watershed Management Project (NJ)*. A long-term effort sponsored by the EPA to address nonpoint source pollution. Diverse participants has included local and state officials, community members, and river protection committees.

7. *Setting standards for cleanup of radionuclides in soils at Rocky Flats (CO)*. Various mechanisms have been used to provide input to the DOE about the setting of "soil action levels" for cleanup of soils contaminated with plutonium. One process involves a Site Specific Advisory Board. A second is focused on providing input from local governments.

8. *Assessing public health risks from radiological contamination at Fernald (OH)*. Fernald had one of four subcommittees established by the Centers for Disease Control and Prevention and the Agency for Toxic Substances and Disease Registry to provide advice about public and worker health-related studies and activities around nuclear weapons facilities. This process has engaged local citizens in complex deliberations over the design and conduct of environmental health studies, including analysis of uncertainties.

9. *Plutonium contamination from sewage sludge in Livermore (CA)*. The Lawrence Livermore National Laboratory [LLNL] (CA) has been placed on the National Priorities List of Superfund sites for a variety of contamination problems. As one example, federal agencies determined that operations at LLNL contami-

nated processed sewage sludge from the Livermore Water Reclamation Plant with plutonium. As part of the assessment process for characterizing the public health risks from the plutonium-contaminated sludge, two opportunities were created for public participation.

10. *Boston Harbor Islands National Park Area (MA)*. A unique participation process started by the NPS in 1996 as an alternative to the "command and control" approach to running national parks. It consists of a two-tiered participation process consisting of an advisory council of 28 stakeholder group representatives who advise a partnership of 13 members who are responsible for managing the park.

Q Method

Overview of Q

To identify the variety of perspectives held among stakeholders about what constitutes a good assessment or decision-making process in the case studies, we used Q methodology as our research tool (Brown, 1986, 1996; Dayton, 2000; Kalof, 1998; McKeown & Thomas, 1988; Niemeyer, Petts, & Hobson, 2005; Johnson and Chess, submitted).[1] This is a type of discourse analysis that integrates quantitative and qualitative techniques to understand points of view on a subject. By inquiring from people with unique points of view, Q researchers can reveal patterns on how elements of perspectives are related. Case analyses of specific processes have revealed that several different perspectives about how assessment and decision-making processes utilizing public participation should be designed can exist among participants involved with the same process (Tuler et al., 2005; Tuler and Webler, Forthcoming; Webler et al., 2001; Webler et al., 2004).

Q methodology requires that subjects sort statements related to an issue of interest (under a specific condition of instruction which is described below). Subjects sort the statements to reflect their personal point of view. Typically researchers select 20–70 statements for inclusion in a study. But since the perspectives are unknown, we must select the sample of statements systematically. Ideally, the sample of statements must represent all key aspects of perspectives on the issue.

Once people express their subjective preferences by ranking the statements into ordinal categories, factor analyses are used to reveal patterns among how the different statements are related. For data analysis, we used a freeware program called MQMethod.[2] The factor analysis enables the researcher to look for patterns in the ways that people organize the statements. The output of the data analysis is a set of factors where each factor is defined by a particular ordering of the statements.

These factors represent "social perspectives" or "social narratives" in the terminology of the Q method literature. This is because they are understood to represent conceptual schema that are idealized, which means that an individual

may legitimately hold aspects of multiple perspectives. Thus, it is possible to compute how similar is any individual's Q sort to each factor. For each individual, a loading score is computed for each factor, in essence telling the degree to which that individual's sort is like that factor. The score ranges from +1.00 (indicating that participant's sort exactly matched the factor) to –1.00 (indicating that participant's sort was the exact opposite of the factor sort). Zero indicates no similarity at all. The analysis can reveal one dominant factor, suggesting that everyone uses the same conceptual schema to interpret the phenomenon, or it may produce several factors. For instance, if we were using Q to study people's preferences for climate change policy, we might find one idealized narrative that promotes carbon taxes and a second that promotes voluntary fuel switching. Any individual's Q sort might correlate highly with one or the other of these perspectives, it might correlate moderately with both perspectives (meaning the person feels that a two-pronged solution is the best), or it might not correlate with either (suggesting the person has a totally different point of view).

Applying Q Method in the 10 Case Studies

To apply Q method in our research project we began by assembling a large number of potential statements. Statements came from: (1) interviews we conducted with participants in other studies (we did not interview people in these cases) and (2) from an extensive review of the academic and practitioner publications in the field. From these two sources we extracted ideas and claims about what are important elements of public participation in environmental assessment and decision making. These ideas and claims were then expressed as short statements and, drawing on a conceptual categorization we developed in earlier research, we divided this large pool of over 250 statements into the conceptual categories. We included ideas about both processes and outcomes because people (including theorists, practitioners, and participants) do not always evaluate processes independently of the outcomes that emerge (Chess & Purcell, 1999; Tuler & Webler, 1999). We then chose statements from each category. This is how we ended up with the 56 statements in Table 1; they are grouped by the conceptual categories.

We selected individuals who were actively involved in the participatory process and who represented different points of view regarding public participation. The total number of people conducting Q sorts was 117, and ranged from 10–12 in each case. We approached the identified individuals via telephone or email, introduced them to the project, described how they were selected, and told them about Q methodology and the Q sort exercise. We visited them at their convenience. Usually meetings took about one hour, but in a couple of cases they were much longer (e.g., three hours). To help us identify participants (as well as better understand the background of the case and assist in interpretation of the results), we obtained input from local collaborators who had studied the particular process or were organizers of the process.

Table 1. Q Statements and Their Ranking for Each Factor

No.	Conceptual Categories/Statements	Factor			
		A	B	C	D
	Relational qualities among participants in deliberation *Promotes listening and consideration*				
1	Set up a situation that encourages all participants to listen to what others say and to consider it carefully.	0	4	2	1
	Promote constructive collaboration (relationship building, team building)				
3	Establish relationships that promote constructive collaboration among participants.	1	0	4	3
	Promoting a competent process				
5	Develop a common language and understanding among participants.	−3	0	2	1
	Promoting trust				
7	Work to build trust among the different participants during the process.	−1	3	5	1
	Features of good participants *Courteous, friendly, and respectful*				
9	Participants should be courteous and respectful to one another.	0	2	4	0
	Collaborative orientation, constructive				
11	Participants should see beyond their individual interests to what is good for the larger community.	1	1	4	2
	Accountable, sincere, reliable, and trustworthy				
13	Participants should be accountable for what they say, sincere in their promises, and reliable in carrying them out.	0	0	1	3
	Reasonable				
15	Participants should have reasonable expectations about what the agencies are able to do.	2	−3	3	0
	Committedness, stability, reliability, and a sense of ownership				
17	Participants should attend meetings regularly and see tasks through to completion.	2	0	0	−2
	Competence				
19	Participants should be able to deal with complex technical issues.	−1	−4	−5	−1
	Atmosphere and format of interaction *Comfort and safety*				
21	Participants should feel comfortable and safe at the meetings.	−3	1	3	−1
	Rules				
	Physical setting				
25	Pay attention to the physical arrangement of tables and chairs at the meetings	−5	−3	−4	−5
	Substance of deliberation *Discuss the values underlying people's opinions about the issues.*				
27	Discuss the values underlying people's opinions about the issues.	−5	−2	−1	0
	Agenda setting and content				
31	Everyone has an equal chance to put their concerns on the agenda.	−3	2	0	0
33	The process has to be able to limit topics of discussion in order to avoid quagmires.	1	−2	−2	−1
	The process requires unbiased and independent facilitation.				
35	The process requires unbiased and independent facilitation.	−2	1	−1	4
	Clarity within the process				
37	The purposes and goals of the process are clear to all involved.	4	3	5	4

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Table 1. Continued
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No.	Conceptual Categories/Statements	Factor			
		A	B	C	D
	Access to information				
	Sharing information				
39	All participants have equal access to information.	1	4	0	2
41	There is full disclosure of information at all times.	3	5	−2	3
43	The staff involved are receptive to questions or requests for information from the public.	2	2	1	1
	Local expertise and professional scientific knowledge				
45	Get the right information.	3	−2	0	5
47	The process taps the knowledge and experiences of local people.	4	5	2	0
	Leadership				
49	The process needs an effective leader.	5	0	5	−4
	Administrative support				
51	There is adequate administrative support (e.g., funding, staffing) for the life of the process.	3	2	1	−3
	Timing and duration				
	When in the policy issue does process occur				
52	The process is well-timed to the responsible agency's window of opportunity to act.	0	−4	−2	−2
	Does it end?				
18	It is clear under what conditions the process will end.	1	−4	−1	−1
	Stick to timetable				
54	Allow time to revisit issues and decisions, even if it means extending the timetable.	−2	0	−3	−1
	Adequate notification				
53	There is adequate notification of meetings, comment periods, etc.	0	3	0	−2
	Quality of analysis				
	Involve participants in interpretation and design of analysis				
55	Participants are involved in deciding *what* studies ought to be done.	2	1	−2	1
56	Participants are involved in deciding *how* studies ought to be done.	−1	−1	−5	0
	Qualities of good analysis				
2	Use the best available science in the analysis.	5	0	1	5
4	Acknowledge and explore uncertainties.	−1	0	−2	2
29	Validate all information to make certain it is correct.	2	−1	−3	2
	Representation, outreach, and fairness				
	Openness				
6	Reach out in a number of different ways through different mechanisms to different communities on different issue points, throughout the process.	0	0	−1	2
8	Hold meetings at different times and places so no one is excluded from participating.	−5	4	−4	−3
10	Provide financial resources that enable people to participate effectively (e.g., travel, hire experts).	0	0	−3	−5
12	The process cannot be open to just anyone who wants to participate, participation has to be restricted in some way.	−2	−5	−5	−5
40	All-important stakeholders are taking part in the process.	3	5	3	1

Table 1. Continued

No.	Conceptual Categories/Statements	Factor			
		A	B	C	D
	Decision making				
	Advisory vs. veto power				
14	The process gives recommendations to the responsible agencies, who then make the final decisions.	−3	−5	3	−2
	Consensus				
16	All-important decisions are made according to consensus (including the agenda).	−4	3	−4	−4
22	Consensus is used to decide what rule is used to make decisions (simple majority vote, 2/3 majority vote, etc.).	−2	1	0	−1
	Basis for decision making				
20	Every recommendation is justified with evidence.	0	−3	−3	3
23	There are clear ground rules that govern how people should interact.	0	1	2	0
	Responsiveness of sponsoring organization				
24	The responsible agencies respond in a timely way to all questions, comments, and requests.	2	1	0	0
26	Opportunity cannot be an empty shell; there need not only be opportunities to be heard but there also has to be some way for the public to see that the decision makers are listening.	−1	2	1	1
	In-group/out-group communication				
28	There are mechanisms for communicating to the broader public about what decisions are being considered and made.	1	2	0	−1
30	Participants who represent groups check in with their memberships regularly to ensure that they represent their views accurately.	−2	−1	0	−3
	Outcomes				
	Social capacity				
32	The process improves the participants' skills to participate effectively in processes like this (e.g., problem solving, conflict resolution, communication).	−4	−1	−2	−2
	Knowledge about the issue				
34	The process improves participants' understandings.	−1	−1	0	2
	Trust				
36	The process ends up enhancing the trust between the community and responsible agencies.	0	−2	2	4
	Reduce conflict				
38	The process does not make any preexisting conflicts worse.	−1	−3	−1	−2
	Substantive aspects				
	Is the outcome clear?				
42	At the end of the process there is a clear plan for how to implement the final decision.	5	−1	1	0
	Outcomes of process should contribute to progress on policy objectives				
44	The process makes progress on solving the right problem.	4	−2	1	5
50	One outcome of the process is a plan to ensure that the promises made are actually followed through, that organizations are accountable for their promises.	1	−1	2	0
	Satisfaction				
46	The process produces outcomes that are acceptable to me or my organization.	−2	−2	−1	−3
48	The process produces outcomes that are acceptable to the responsible agencies.	−4	−5	−1	−4

To conduct the Q sort exercise, we handed each subject a set of small cards (about the size of a normal business card), each with one Q statement printed on it. A condition of instruction specified the context under which the participant was to interpret and react to the Q statements. For example, in our case study of the planning process to address the risks of plutonium contamination from sewage sludge in Livermore, CA, we asked the subjects to:

> *Imagine that the process to assess risks from plutonium contamination from sewage sludge is going to be done again. Sort the statements according to what you believe should be the most important to least important factors guiding the design of the process.*

This condition of instruction was designed to focus the participants' thinking on the topic of assessment (and communication) of health risks from the sludge. We wanted to draw on each participant's experiences with the decision making and public participation processes to date and at the same time get his or her ideas of what would be the best way to design such a process in the future. We did not ask the people to evaluate the process that had occurred, although we expected, of course, that their experiences would influence their ideas for a new process. Similar conditions of instruction were used for each of the case studies.

This is how the Q sorts happened. We asked each subject to read all the statements through once or twice. Then we asked them to sort the statements into three piles, the left-hand pile being the less important ideas, the right-most pile being the most important ideas, and the middle pile being in-between. We then asked them to continue sorting the statements according to their relative importance in their individual opinion. The sorting was constrained by forcing participants to sort the cards into a specific pattern that forms a normal distribution.[3] This pattern is shown in Figure 1. Three cards could be placed in the two left-most columns, four in the third column, and so on. Only the ends were anchored, with the right being "most important" and the left labeled "least
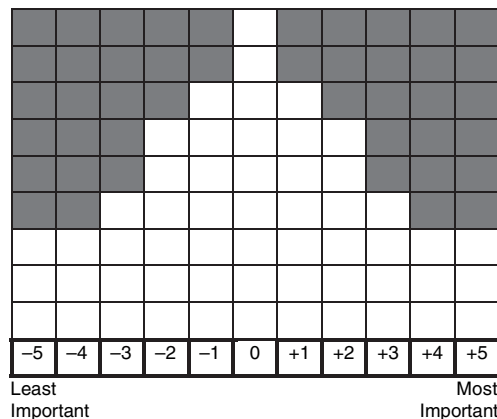

Figure 1. Layout for Q Sort Cards.

important." The scale was relative, not absolute. In other words, a certain participant may have felt that *all* the statements were important, but he or she still had to differentiate between the *most* and *least* important. Thus, it is important to note that, while the right-most edge contains statements the participant thought were most important, and the left-most edge contained statements considered least important, the middle *does not* contain statements that are viewed as irrelevant or unimportant. Participants were able to move cards around whenever they wanted and the researcher did not record the sort until the participant indicated satisfaction with it.

Participants reported the Q sort was innovative, fun, and that it stimulated their thinking. During the sort, the researcher asked the participant to talk about the sorting and how he or she interpreted the statements. These comments were recorded and used to help interpret the results. For example, to better understand the scale employed by the subjects, we asked each of them to draw a line to separate statements to the right that were "essential" to them and to the left those that were important but not "essential." Using MQMethod, as described above, we used principal components analysis followed by the varimax solution. Theoretically, this solution accounts for the most variance in the data.

Results

For the 117 participants in our study, the analysis revealed four factors about public participation process. Table 1 indicates the ranking that each statement has in each factor, using the same 11-point distribution that is shown in Figure 1. Each of the 117 respondent's Q sorts loads on these four factors and Table 2 shows how many people loaded significantly on each factor.[4] The data are broken down by cases. Twenty-four people did not load significantly on any factor, which means that the factors captured here only tell part of the story. The percentage of

Table 2. Number of Individuals from Each Case Study Who Loaded Significantly on Each of the Four Factors (A, B, C, D) and the Number Who Loaded On No Factor at All

Case	N	Policy Arena	A	B	C	D	No Factor
Fernald	10[a]	Radiation	3	1	5	0	2
Livermore	13	Radiation	3	5	2	0	3
Rocky Flats	12	Radiation	4	2	1	2	3
Dungeness	11	Watershed	2	0	6	1	2
Morro Bay	12	Watershed	6	1	0	0	5
Raritan	11	Watershed	4	5	0	1	3
Applegate	12	Forestry	2	2	6	1	1
Finger Lakes	12	Forestry	3	5[b]	2	1	1
Flagstaff	13	Forestry	1	5	4[b]	2	2
Boston Harbor	11	National Park	3	2	3	1[b]	2
TOTAL	117		31	28	27	9	24
Variance explained			12%	11%	11%	6%	

[a]Totals add to more than number, because some people loaded significantly on more than one factor.
[b]Includes one individual who loaded negatively on this factor.

explained variance by the four factors is 40 percent. Factors A, B, and C each explain 11–12 percent of the variance, while factor D explains only 6 percent. We tested solutions with additional factors, but they added little additional explanation and more respondents loaded on multiple factors. We present these data only to illustrate that the factors we identified are not specific to a certain type of policy arena. However, these data also suggest that some factors *may* not be present within a particular case—although this may also be an artifact of the individuals who completed the Q sorts. Because our participants were not selected to be representative of all involved in the 10 cases, it is not possible for us to claim that a factor is *not* present within a particular case or to assess the relative frequency of a factor within a particular case or policy arena.

On the other hand, we believe that the four factors provide coherent representations of participants' preferences for processes defined by the conditions of instruction. The conceptual categories and 56 statements provided an adequate means for participants to describe key "building blocks" of assessment and decision-making processes that they think are appropriate for their particular context. In particular, one measure of this adequacy is that after each Q sort, we asked if the subject could think of any additional elements that would be important to him or her that were not represented in the Q statements. None of the 117 people who completed sorts in our 10 case studies in our full research project suggested additional elements.

Table 3 describes the independence of the different factors. The most independent factors are A and B, which are 26 percent alike. Factors C and D each have about 45 percent of their content in common with factor A.

In our study each of the four factors represents an idealized social perspective about what is an appropriate process in the context defined by the condition of instruction. The tricky part of the analysis is figuring out exactly what each factor means. What perspective is being expressed by those who load significantly on a factor? Based on the arrangement of statements in each of the four factors (as shown in Table 1), we composed a written narrative describing the particular perspectives represented by each factor. These are described in the following sections.

Descriptions of the Perspectives Represented by the Four Factors

Factor A: Science-Centered Stakeholder Consultation. The perspective represented by this factor describes a participatory decision-making process that is streamlined

Table 3. Correlations between Factors

	A	B	C	D
A	1.00	0.26	0.45	0.46
B		1.00	0.35	0.34
C			1.00	0.37
D				1.00

and task-centered (37, 44) with a clear utilitarian focus on producing real progress on the problem (44). The purpose of the process is oriented toward taking action (42) rather than on producing advice for a sponsoring agency (14).

Two of the primary ingredients to success are strong leadership (49) and good information and scientific analysis (2, 47, 45, 41, 29, 55, 24). Strong leadership is necessary to keep the process on track. The need for good information and scientific analysis is defined broadly. The process should use the best available science for analysis, tap knowledge and experiences of local people, get the right information, and validate all information to make sure it is correct. In addition, participants should have a voice in decisions about what studies to do, although it is not so important for them to be involved in deciding how to do them (56).

The importance of stakeholders in the process is further emphasized by the strong emphasis on including all-important stakeholders (40). The role of stakeholder participants is not broad or powerful, however. The purpose of involving important stakeholders is to ensure that all relevant and important information informs deliberations and decisions. Other than their role in providing information to inform the process, the only other important elements related to stakeholders are that they should attend regularly (17; so that progress is rapid) and that they be reasonable about what the regulatory agency can do (15; so that the process is focused on relevant matters). Both these features will help the process run smoothly. On the other hand, there is little interest in features that could delay the process or give stakeholders strong influence over outcomes, including using consensus (16, 22), allowing time to revisit issues (54), allowing participants to place topics on the agenda (31), exploring uncertainties (4), or discussing values (27). In keeping with a streamlined and task-centered approach, agency staff are responsible for disseminating information (41, 43) and providing the administrative support for the process (51).

Factor B: Egalitarian Deliberation. The perspective represented by this factor emphasizes the importance of empowering participants and is a reaction against dominance of the agency over the process. Features that empower participants are strongly endorsed, including access to the process (40, 8, 53), access to information (41, 39), encouragement of deliberation (1, 7, 28, 26), and power to shape the discussion and its outcome (16, 31). On the other hand, features that would disempower participants are ranked low, including those that limit who can participate (12, 19, 15), limit topics of discussion (33), constrain the timetable (18, 52), or impose restrictions on outcomes of the process (48, 14, 20, 38, 46).

Independent/unbiased facilitation (15), strong leadership (15), and ground rules for interaction (23) are not considered to be essential. Instead, key stakeholders can be relied upon to participate meaningfully and effectively and make decisions wisely. This viewpoint reacts against the governmental agency seizing control over the definition of the problem (hence the negative score for "solve the right problem" (44)) and manipulation of the process (e.g., through reliance on technical information that limit the public's ability to be fully involved). Thus,

while informed deliberation is important to this view (41, 47, 39), scientific analysis is not (2). Nor is there a central role for discussion of values (27) because disputes about values are not resolvable.

While the perspective represented by this factor emphasizes empowerment of participants in a process, it reveals mixed emphasis on building social capacities of the participants. On the one hand, there is scant attention to improving understandings (5, 34) or skills of participants to engage in deliberative policy-making (32), and even less emphasis on enhancing trust between the community and the agency (36). However, there is strong support for not making pre-existing conflicts worse (38) and for building trust among the participants (7).

Factor C: Efficient Cooperation. Central to this perspective represented by this factor is a belief that the purpose of the process is to give recommendations to the responsible agency, which will then make a decision (14). This is antithetical to having all the important decisions made by consensus (16). Yet, there is a strong implication that, although the agency has the decision-making authority, the decision should serve the collective good, not just what the agency finds acceptable (48).

To ensure that deliberation does not get bogged down in arguments, this perspective seeks to promote trust among participants (7), build collaborative relationships (3), develop a common language and understanding among participants (5), and promote listening (1). For the process to work well, the participants need to exemplify certain characteristics. Foremost is that they be able to see beyond their individual interests to what is good for all (11). This helps move the process away from factionalism, toward a collective good that the agency can then pursue. For this same reason, participants should be respectful and courteous (9), and have reasonable expectations about what the agency can do (15). Just in case participants do not behave themselves, there are ground rules (23), and an effective leader (49), which, interestingly, is not the same as having an unbiased and independent facilitator (35). This is a process led by the agency, whose strong leader outlines the goals clearly (37).

The primary function of public participation here is to supply comment and feedback for the agency to consider when deciding what to do. In contrast to the perspective represented by Factor A, those whose views are represented by this factor are not interested in making the process broadly democratic or empowering participants. While it is important that all the important stakeholders take part (40), other features to improve access and outreach are not emphasized (10, 28, 6, 8). Nor is there concern for power imbalances among participants; there is little support for participants' ability to place topics on the agenda (31) or consensus (16, 22).

The perspective represented by this factor also does not place science and evidence in a central role. Consistent with the emphasis on giving the agency decision-making authority, this perspective disagrees that all recommendations need to be supported with evidence (20), because requiring that would unreasonably tie the hands of the agency. As with the previous perspective, there is no

support for using the best available science (2). There is even less support for validating all information (29). Consistent with de-emphasizing science and empowerment, this perspective ranked very low statements about including participants in decisions on what studies should be done or how the studies should be done (55, 56).

Features that would reduce the efficiency of the process are discouraged, such as allowing time to revisit issues and decisions (54), setting schedules to accommodate participants (53), depending upon consensus decision making (16), or acknowledging uncertainties (4).

Factor D: Informed Collaboration. The perspective represented by this factor envisions an ends-oriented process that makes progress on the central problems (44). Progress is achieved through a collaboration of key stakeholders and the sponsoring agency that engenders legitimacy for the agency to act. In this perspective the agency seeks legitimacy for its decisions in two ways. First, high-quality information and analysis should inform deliberations. Second, trust between the community and the agency (36) should be established. On this point of trust, this perspective differs from that which is represented by Factor C. Factor C focused on developing trust among stakeholders in order to promote efficiency.

In this perspective represented by Factor D the central role of technical analysis is emphasized by the need to get the right information (45), using the best available science for analysis (2), justifying recommendations with evidence (20), validating information to make sure it is correct (29), and exploring uncertainties (4). This latter statement was ranked higher in this perspective than any of the others. But there was weaker emphasis on tapping local knowledge (47) or involving stakeholders in deciding what studies to do (55). To inform cooperation among the participants and the regulatory agency the information should be widely shared (39, 41).

Building trust among the community and the agency is addressed through independent or unbiased facilitation (35), establishing clear purposes and goals (37), endeavoring to establish collaborative relationships (3), sharing all information (39, 41), and being open to outcomes that are not necessarily those desired (48). Participants, including the sponsoring agency, are also expected to be accountable for what they say and do (13).

Two features may threaten collaboration and, thus, they are not promoted as part of this perspective. First, strong leadership runs the risk of alienating participants and leading to a lower sense of ownership over the process (49). Second, consensus endangers collaboration by giving participants the opportunity to dig in their heels and not compromise on their preferred outcomes (16). On the other hand, a feature that might promote trust is de-emphasized—adequate administrative support (e.g., funding, staffing) for the life of the process (51). This was probably minimized because people advancing this position were situated in agencies, thus they took this belief for granted.

Finally, the perspective represented by this factor does not emphasize broad, democratic participation even as it seeks to build trust. Features such as holding

meetings at different times and places (8), adequate notification of meetings (53), providing financial support to enable participation (10), and expecting participants to check in with their membership (30) received low rankings.

Comparison of Findings

Q method does not allow us to assess the extent of diversity—which is a question of frequencies within a population. However, it provides a means of assessing the character of the diversity of perspectives. In other words, on what elements of process do people differ? This question is explored in more detail in this section.

We began our exploration of similarities and differences by asking how various perspectives differed in their emphasis on the categories we used to sample statements about process elements (see Table 1). Comparisons are based on summing the z-scores for each statement in every category and perspective, as shown in Table 4.[5] This comparison reveals interesting differences among perspectives on some—but not all—of these categories. Categories for which there are important differences among the perspectives are described.

Relationships and Behaviors (statements 1, 3, 5, 7, 9, 11, 13, 15, 17, and 19). We combined the categories of relational qualities among participants and features of good participants. The Efficient Cooperation perspective is most enthusiastic about the statements relating to relationships and behavior. This perspective expresses a strong interest in participants being trusting, positive, respectful, and constructive. This contrasts with the Science-Centered perspective, which gave low or negative scores to nearly all the statements. However, both these perspectives agreed that participants should have reasonable expectations of agencies, suggesting little tolerance for public outrage or power struggles. The Egalitarian perspective strongly disagrees that participants need to have reasonable expectations of agencies, mainly because it values participants being independent. The fourth perspective, Informed Collaboration, emphasizes positive behavior quite strongly, but does not demand participants have reasonable expectations of agencies. None of the perspectives emphasized participants' abilities to deal with complex problems; and the Egalitarian and Efficient Cooperation perspectives reject this need strongly. Interestingly, none of the perspectives place much importance on improving participants' understandings either (statement 34). Finally, much literature has argued the importance of commitment to a successful process. The Informed Collaboration perspective strongly rejects the notion that commitment is important, and the Egalitarian and Efficient Cooperation perspectives are rather ambivalent. Only the Science-Centered approach strongly agreed that commitment was important.

Leadership (statement 49). In regard to leadership both the Science-Centered and the Efficient Cooperation perspectives felt having a strong leader was important, while the

Table 4. Summary Comparison of the Four Perspectives on Categories and Cross-Cutting Themes Based on Sum of Z-Scores for Statements within Each Category and Theme

Categories	Science-Centered	Egalitarian Deliberation	Efficient Cooperation	Informed Collaboration
Relational qualities among participants in deliberation	−0.29	0.63	1.13	0.59
Features of good participants	0.23	−0.28	0.37	0.18
Atmosphere and format of interaction	1.11	1.02	1.47	1.26
Substance of deliberation	1.36	0.92	1.19	0.67
Access to information	0.41	0.93	0.58	0.82
Leadership	1.82	0.06	1.88	−1.50
Administrative support	1.37	0.65	0.61	−1.09
Timing and duration	0.43	1.35	0.55	0.31
Quality of analysis	1.06	0.40	0.89	0.54
Representation, outreach, and fairness	1.08	1.41	1.17	1.45
Decision making	0.56	1.43	1.23	1.09
Responsiveness of sponsoring organization	0.66	0.01	0.17	0.13
In-group/out-group communication	0.70	0.50	0.02	0.53
Social capital outcomes	0.63	0.52	0.63	1.12
Substantive outcomes	1.43	0.98	0.54	1.22
Cross-cutting themes				
Trust between participants and responsible agencies	0.41	5.92	4.98	4.28
Power of participants to influence process and outcomes[a]	−0.61	8.92	−6.48	1.06

[a]The absolute value of the z-scores for statements 14 and 36 were used to generate these sums because these statements were stated in the negative.

Egalitarian perspective was neutral and the Informed Collaboration perspective was strongly opposed to having strong leadership.

Administrative Support (statement 51). *Adherents to the Science-Centered perspective feel strongly that there should be adequate administrative support for the life of the process (51), compared to those who agree with the Informed Collaboration perspective—who disagree with this need for the process to function well.*

Timing and Duration (statements 18, 52, 53, 54). The Egalitarian perspective places much more emphasis on three of the four statements in this category than do the other perspectives. Empowerment is enhanced when there is no artificial deadline (18) and there is adequate notification of meetings, etc. (54). On the other hand, the perspective that emphasizes efficiency (C) disagrees most strongly with allowing time to revisit issues and decisions (54) for obvious reasons.

Quality of the Analysis (statements 2, 4, 29, 55, 56). As the narrative description highlights, the Science-Centered perspective places a high premium on the quality of analysis. Using the best science is ranked strongly, and there is recognition that analysis may be improved when participants help to decide what studies should be done. The Efficient Cooperation approach wants to avoid anything that could stall progress, including validating information and involving participants in study topic selection and methods. Overall, the Egalitarian and the Informed Collaboration pespectives do not emphasize a strong need for analysis in a process.

It is also interesting to compare the focus on information of each perspective in conjunction with their attention to analysis. Access to information is defined by statements 39, 41, 43, 45, and 47. There are some similar patterns across these related categories. The Science-Centered and the Informed Collaboration perspectives both ranked items high while the Efficient Cooperation perspective gave slight importance to information and negative scores to analysis. The Egalitarian perspective did not strongly value getting the right information (45), but did support statements about equal access to information. It did not stress any statements about analysis. Thus, it appears that Science-Centered and Informed Collaboration perspectives give key emphasis to the role of information and analysis, while Efficient Cooperation de-emphasizes them. The Egalitarian perspective supports equal access and openness in order to empower participants, not because it values a science-driven approach.

Decision Making (statements 14, 16, 20, 22, 23). There is a large debate in the literature and among practitioners about the importance of consensus as a decision rule in assessment and decision-making process that involve public participation. We found a distinct lack of support for using consensus for all decisions or even for deciding a groups' decision rule—expected in the Egalitarian Deliberation perspective, which places a strong degree of emphasis on empowering participants and reacts against the dominance of the agency over the process.

Outcomes. We investigated two types of outcomes associated with the process. The first are outcomes associated with social capacity (statements 32, 34, 35, 36, 38). Except for the question of trust, there were fairly even responses to these questions. No perspective chose to emphasize enhancing dialogue skills of participants, but Informed Collaboration did value enhancing understandings. What is also noticeable is that no perspective felt the process must avoid making matters worse.

With regard to substantive outcomes (statements 42, 44, 46, 48, 50), there is a profound difference among perspectives. Science-Centered Consultation and Informed Collaboration perspectives want to make clear progress on the problem, but this was not important to the Egalitarian Deliberation perspective. The Science-Centered Consultation perspective also focused on having an implementable plan, although no other perspective did. With regard to resulting satisfaction, we found no perspective voicing preference for a selfish or agency-only outcome. All viewpoints seemed to acknowledge the need to satisfy multiple interests.

In a second stage of comparisons we grouped statements thematically on a set of underlying issues that are claimed to matter in public participation. These issues cut across the categories of process features in Table 1. For example, trust and power are affected by elements from different categories. In other words, participants are not necessarily concerned with achieving specific structural or behavioral features, but rather they use these types of "building blocks" to achieve more abstract objectives. We found important differences among the perspectives regarding trust and power, two issues that have received attention in the research literature and guidance and among practitioners.

Trust (statements 7, 9, 11, 13, 21, 36, 39, 41). We asked about building trust among participants (7) and enhancing trust with the agency (36). The four perspectives had complex views on trust. The Science-Centered approach did not emphasize either kind of trust. Egalitarian deliberation agreed on building trust among participants, but was opposed to enhancing trust with the agency. The perspectives based on factors C and D, both agency-oriented approaches, valued both kinds of trust, but with opposite preferences. These differences explain why we chose to use the words cooperation and collaboration to describe these two perspectives. We use "cooperation" to refer to a form of interaction that is more hierarchical and closer to consulting. A cooperative process seeks to build trust *in* the decision maker, while a collaborative approach seeks the built trust *among* participants.

In addition, we built this category using a definition of trust based on multiple elements, including caring, competence, consistency, predictability, and openness (Kasperson, Golding, & Tuler, 1992; Metlay, 1999; Tuler, 2002; Webler, 2002). We used statements 7, 9, 11, 13, 21, 36, 39, and 41 to assess on each perspective's view on trust defined in this way. Only the Science-Centered approach placed little value on trust of this sort, while the other three perspectives all gave it the same degree of importance. However, these perspectives sought to gain trust in different ways. The Efficient Cooperation approach views trust as emerging primarily through the behaviors of participants, as suggested by its emphasis on the

importance of participants being courteous and respectful, seeing beyond their individual interests to what is good for the larger community, and being accountable, sincere, and reliable. In contrast, the Egalitarian Deliberation perspective emphasizes structural features of the process—and, in particular the access to information.

Power of Participants to Influence Process and Outcomes (statements 14, 16, 22, 26, 31, 36, 39, 41, 55, 56). Across the board, the Egalitarian and the Efficient Cooperation perspectives seem to envision participants and the agency in a power struggle. Whether it is on the theme of decision-making authority (14, 16, 22), access to the agenda (39), or access to information (39, 41), the Egalitarian perspective (compared to Efficient Cooperation) takes a view that empowers participants.

Conclusions

This investigation of 10 case studies and 117 actively involved participants has revealed that there are clearly distinct perspectives on what an appropriate public participation process should be. We identified four perspectives and labeled them: Science-Centered Stakeholder Consultation, Egalitarian Deliberation, Efficient Cooperation, and Informed Collaboration. These perspectives exist broadly across the sample of policy arenas and contexts within our sample of cases. Moreover, we also found multiple perspectives among the individuals completing the Q sorts *within* specific cases. In the 10 cases, two perspectives were identified in one case, three perspectives were identified in four cases, and all perspectives were identified in five of the cases. The points of consensus across these perspectives are that: good processes reach out to all stakeholders, share information openly and readily, engage people in meaningful interaction, and attempt to satisfy multiple interest positions. Points of differences included: how strongly to emphasize science and information, how much leadership and direction the process needs, what is the proper behavior of participants, the role and importance of trust, how power is distributed, and what are the outcome-related goals of the process.

The Science-Centered Stakeholder Consultation emphasizes achieving practical outcomes through a science-led process. Its focus is on producing clear progress on the problem, not improving trust or social capital. Egalitarian Deliberation cares little for actual progress on the problem, but is focused on power relations. It attempts to qualify agency authority by guaranteeing participants' access to information and meaningful control over the agenda and the process. Efficient Cooperation and Informed Collaboration both emphasize meeting agency objectives, but aside from an interest in promoting trust, they have little in common. Efficient Cooperation starts from a belief that agencies possess legitimacy and need to consult or cooperate with stakeholders in a limited and controlled fashion. The focus is on "proper behavior" of participants. Strong leadership is the key to keeping stakeholder participation focused and on-track.

We invoked the word "cooperation" here as a label that signals acceptance of agency leadership but not necessarily the prevalence of power equality. Informed

Collaboration, on the other hand, is more oriented toward acquiring popular legitimacy through meaningful outreach and interaction. We have labeled this "collaboration" because it tends to place agencies on par with participants. In addition, there is a distinction among perspectives in the emphasis they place on individual behaviors and relationships versus structural features to achieve desired process characteristics. For example, the Egalitarian Deliberation approach emphasizes structural features of a process that can enhance trust between participants and responsible agencies, while the Efficient Cooperation approach places more responsibility on individual participants' behaviors.

These results highlight a challenge for both theorists and practitioners of public participation. Much of the literature on public participation tends to presume that there are clear and universal criteria on how to "do" public participation correctly. Others that do not presume the universality of criteria argue that context is a critical factor (e.g., level of conflict, type of problem under consideration, loci of decision-making authority). This study has revealed that things are not as simple as they may seem. The results challenge practitioners wrestling with these challenges to take into consideration the diversity of participants' needs and perspectives when fashioning prescriptions for how public participation processes are designed, carried out, and evaluated. They challenge those wishing to build theory of public participation to make a more nuanced account of what features are important for "success" and how to evaluate "success" in particular cases when there may be diverse ideas about what is appropriate or preferred. Further research would be useful to better understand who prefers particular kinds of processes and outcomes and in which contexts, as well as how individuals' preferences may vary by context and how preferences for process may be related to preferences for and satisfaction with outcomes. Furthermore, our results indicate that many people prefer "mixed" processes, which combine elements from multiple perspectives (as evidenced by loading scores). This suggests that people's preferences may evolve through learning and negotiation—which opens doors for further exploration of how to craft "good" processes that meet the needs of diverse participants and sponsors.

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