# When Does Deliberating Improve Decisionmaking?

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> "Deliberative democratic theorists maintain that if citizens reach more reflective political judgments, they will directly and indirectly lead the polity toward better public policy decisions."
>
> —Gastil and Dillard[1]

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1. John Gastil & James P. Dillard, *Increasing Political Sophistication Through Public Deliberation*, 16 POL. COMM. 3 (1999).

"When . . . [deliberating] . . . Americans will be not encountering one another as consumers or coreligionists or even friends—but as citizens searching for common ground . . . in a common enterprise."

—Ackerman and Fishkin[2]

"Ideal deliberation aims to arrive at a rationally motivated consensus—to find reasons that are persuasive to all . . . ."

—Cohen[3]

"[D]eliberation allows people to discover latent *public* values that they have in common with others, and in the process to create new public values. Together, citizens begin to . . . identify what they value most about the community, and to uncover goals and commitments that transcend their narrower self-interests."

—Reich[4]

## I. INTRODUCTION

For decades, legal scholars, social scientists, political theorists, and others have extolled the virtues of deliberation, arguing that we should incorporate more deliberative practices into our political institutions. To that end, scholars have argued that our electoral processes should be made more deliberative (perhaps through the use of deliberative polling),[5] while others recommend that deliberation processes be augmented in legislatures,[6] courts,[7] and agencies.[8] Deliberation is proposed as a major

2. Bruce Ackerman & James S. Fishkin, *Deliberation Day*, *in* DEBATING DELIBERATIVE DEMOCRACY 7, 22 (James S. Fishkin & Peter Laslett eds., 2003).

3. Joshua Cohen, *Deliberation and Democratic Legitimacy*, *in* DELIBERATIVE DEMOCRACY: ESSAYS ON REASON AND POLITICS 72 (James Bohman & William Rehg eds., 1997).

4. Robert B. Reich, *Public Administration and Public Deliberation: An Interpretive Essay*, 94 YALE L.J. 1617, 1636 (1985) (emphasis in original).

5. *See generally* Ackerman & Fishkin, *supra* note 2.

6. *See generally* JOSEPH M. BESSETTE, THE MILD VOICE OF REASON: DELIBERATIVE DEMOCRACY AND AMERICAN NATIONAL GOVERNMENT (1994); ESTEEMED COLLEAGUES: CIVILITY AND DELIBERATION IN THE U.S. SENATE (Burdett A. Loomis ed., 2000); BILL GRANSTAFF, LOSING OUR DEMOCRATIC SPIRIT: CONGRESSIONAL DELIBERATION AND THE DICTATORSHIP OF PROPAGANDA (1999); GARY MUCCIARONI & PAUL J. QUIRK, DELIBERATIVE CHOICES: DEBATING PUBLIC POLICY IN CONGRESS (2006); DAVID WHITEMAN, COMMUNICATION IN CONGRESS: MEMBERS, STAFF, AND THE SEARCH FOR INFORMATION (1995).

7. JEFFREY ABRAMSON, WE, THE JURY: THE JURY SYSTEM AND THE IDEAL OF DEMOCRACY (1994).

palliative and, for some, even a panacea for nearly all that is wrong in society—a procedural "cure all" for self-interested decisionmaking,[9] for an uninformed citizenry,[10] for the oppression of minorities,[11] for social fragmentation,[12] and for low levels of confidence in our government,[13] among other ills.

In all of this frenzy to cure societal ills through deliberation, however, scholars have either explicitly or implicitly assumed their own conclusion: that deliberation has social welfare-enhancing effects. The social welfare enhancement claim for deliberation is that increasing deliberation will lead to better decisionmaking, where "better" is defined as improving social welfare.

From a cognitive science perspective, the conclusion that deliberation improves social welfare is peculiar. Indeed, much of the cognitive science literature causes us to question not only the welfare-improving effects of deliberation, but also the core assumptions upon which theories of deliberation rest.[14] Specifically, scholars who advocate deliberation assume that the participants will speak to each other, listen to each other, respect each other, and then learn from one another's statements. As the cognitive science literature reminds us, however, speaking, listening, and learning are all costly behaviors; that is, when we speak or listen to one

8. *See* Mariano-Florentino Cuéllar, *Rethinking Regulatory Democracy*, 57 ADMIN. L. REV. 411, 415-18 (2005).

9. *See generally* Cohen, *supra* note 3, at 67-92; Jurgen Habermas, *Three Normative Models of Democracy*, *in* DEMOCRACY AND DIFFERENCE: CONTESTING THE BOUNDARIES OF THE POLITICAL 21 (Seyla Benhabib ed., 1996).

10. *See generally* JAMES S. FISHKIN, DEMOCRACY AND DELIBERATION: NEW DIRECTIONS FOR DEMOCRATIC REFORM (1991); AMY GUTMANN & DENNIS THOMPSON, DEMOCRACY AND DISAGREEMENT 100-01 (1996); James S. Fishkin & Robert C. Luskin, *The Deliberative Poll: A Reply to Our Critics*, 7 PUB. PERSP. 45 (1996); Gastil & Dillard, *supra* note 1; Bernard Manin, *On Legitimacy and Political Deliberation*, 15 POL. THEORY 338 (1987).

11. Philip Pettit, *Democracy, Electoral and Contestatory*, *in* NOMOS XLII: DESIGNING DEMOCRATIC INSTITUTIONS 105 (Ian Shapiro & Stephen Macedo eds., 2000).

12. GUTMANN & THOMPSON, *supra* note 10, at 73; Cohen, *supra* note 3, at 67-92.

13. *See generally* BENJAMIN R. BARBER, *Thin Democracy: Politics as Zookeeping*, *in* STRONG DEMOCRACY: PARTICIPATORY POLITICS FOR A NEW AGE 3 (1984); Ackerman & Fishkin, *supra* note *2*; Cohen, *supra* note 3, at 67-92; John S. Dryzek, *Legitimacy and Economy in Deliberative Democracy*, 29 POL. THEORY 651 (2001); Manin, *supra* note 10.

14. For a discussion, see Arthur Lupia, *Deliberation Disconnected: What it Takes to Improve Civic Competence*, 65 LAW & CONTEMP. PROBS. 133 (2002).

person, we must forego the opportunity to do something else.[15] Further, because humans have limited energy, they are able to pay attention to and remember only a small fraction of the information available to them.[16] What these cognitive limitations imply for successful deliberation is this: Whatever the relationship between idealized theories of deliberation and social welfare, deliberation in practice is unlikely to improve social welfare because it is improbable that groups of people will be willing to speak, listen, and learn from one another.

The positive and normative literatures on deliberation are vast and complex, and this Article, despite its promisingly ambitious title, has a limited objective. In light of the epistemic claim on behalf of improving deliberation, we consider some results from modern game theory and our own laboratory experiments that bear on the questions of whether and in what circumstances individuals deliberate and when this deliberation inornatus-a-um improves social welfare.

This Article proceeds as follows. First, we briefly discuss the concept of deliberation in the contemporary literature on the subject. While democratic and legal theorists grapple with the conundrum of what deliberation means in theory and in practice, we discuss briefly where these views on deliberation converge in the scholarly discussion. After describing the core features of deliberation as a welfare-enhancing enterprise, we next discuss the relevance and structure of our experiments, describing how our experiments are closely analogous to modern models of deliberation. We then present the results of our experiments, results which indicate that deliberation, even when attempted under ideal conditions, does not improve social welfare, and, in all but rare circumstances, may decrease it.

While of the focus of this Article is on deliberation as a palliative to decisionmaking, we conclude with a brief, preliminary discussion of an important non-deliberative decisionmaking device, that is, so-called expertise systems (which we define as settings in which at least one participant has knowledge about a particular topic, and the other participants have opportunities to learn from that knowledgeable participant's statements). We show how such systems can, by contrast to the deliberation model, consistently lead to large improvements in social welfare. We conclude with a discussion of the (im)possibility of deliberative democracy.

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15. ARTHUR LUPIA & MATHEW D. MCCUBBINS, THE DEMOCRATIC DILEMMA: CAN CITIZENS LEARN WHAT THEY NEED TO KNOW? 22 (1998); Lupia, *supra* note 14.

16. *See generally* LUPIA & MCCUBBINS, *supra* note 15, at 17-38; DANIEL L. SCHACTER, THE SEVEN SINS OF MEMORY: HOW THE MIND FORGETS AND REMEMBERS (2001); Arthur Lupia, *The Wrong Tack*, 3 LEGAL AFF. 43, 43-45 (2004).

## II. UNPACKING DELIBERATION

The case for deliberation comprises two distinctive strands of argument. The first strand focuses on the intrinsic values associated with citizen discussion over policy ends and means in deliberative settings. It is fair to describe this school of thought as the most coherently articulated position in the scholarship on deliberation. It is a view for which a wide range of democratic theorists, including Joshua Cohen,[17] Jurgen Habermas,[18] John Dryzek,[19] James Fishkin,[20] and Philip Petit,[21] among others,[22] argue. And it is a view that has become important to prominent academic lawyers, including Bruce Ackerman,[23] Ronald Dworkin,[24] Frank Michelman,[25] Cass Sunstein,[26] and Mariano-Florentino Cuellar.[27]

In this account, deliberation is tied squarely to democracy and constitutional self-government; that is, the values and virtues of deliberative democracy as an ideal are thought to enhance democracy by encouraging and incentivizing citizens to participate in organized ways in discursive politics and policymaking. As Joshua Cohen puts it:

> [T]he deliberative conception offers a more forceful rendering than aggregative conceptions of the fundamental democratic idea—the idea that decisions about the exercise of state power are *collective*. It requires that we offer considerations

17. Joshua Cohen, *Democracy and Liberty*, *in* DELIBERATIVE DEMOCRACY 185, 222 (Jon Elster ed., 1998).

18. JÜRGEN HABERMAS, 1 THE THEORY OF COMMUNICATIVE ACTION: REASON AND THE RATIONALIZATION OF SOCIETY (Thomas McCarthy trans., 1984).

19. JOHN S. DRYZEK, DELIBERATIVE DEMOCRACY AND BEYOND: LIBERALS, CRITICS, CONTESTATIONS (2000).

20. FISHKIN, *supra* note 10.

21. Petit, *supra* note 11.

22. *See generally* JAMES BOHMAN, PUBLIC DELIBERATION: PLURALISM, COMPLEXITY, AND DEMOCRACY (1996); AMY GUTMANN & DENNIS THOMPSON, WHY DELIBERATIVE DEMOCRACY? (2004); ETHAN J. LEIB, DELIBERATIVE DEMOCRACY IN AMERICA: A PROPOSAL FOR A POPULAR BRANCH OF GOVERNMENT (2004); Cohen, *supra* note 17; Gastil & Dillard, *supra* note 1; Robert E. Goodin, *Democratic Deliberation Within*, 29 PHIL. & PUB. AFF. 81 (2000); Manin, *supra* note 13; Reich, *supra* note 4.

23. Bruce A. Ackerman, *The Storrs Lectures: Discovering the Constitution,* 93 YALE L.J. 1013 (1984).

24. *See* RONALD DWORKIN, LAW'S EMPIRE (1986).

25. Frank I. Michelman, *The Supreme Court, 1985 Term, Forward: Traces of Self Government*, 100 HARV. L. REV. 4 (1986).

26. *See* CASS R. SUNSTEIN, DEMOCRACY AND THE PROBLEM OF FREE SPEECH (1993).

27. *See generally* Cuéllar, *supra* note 8, at 411-14.

> acceptable to others, understood to be free, equal, and reasonable, and whose conduct will be governed by the decisions.[28]

Significantly, this account celebrates deliberation separate from the prospect that arrived-at decisions will be "better" from the vantage point of any objective rendering of social welfare.

The second strand of the case for deliberation—less formed, but nonetheless conspicuous—is the argument that deliberation enhances social welfare. The claim made here is that deliberation leads to better decisions, where better is defined as enhancing social welfare. John Ferejohn usefully labels this view "epistemic," in that it sees deliberation as a process "which aims to find the best course of public action."[29]

Because our focus here is on this second claim—the claim that deliberation enhances social welfare—we need to clarify what exactly these advocates of the deliberative model mean by deliberation. Adam Przeworski notes that, at the very least, deliberative decisionmaking "is a form of discussion intended to change the preferences on the bases of which people decide to act."[30] To be sure, this may be a stricter condition—what we might call the *endogenous preferences* condition—than many advocates for deliberation would want to accept. For those who regard the speech situation in deliberative settings (one thinks most conspicuously here of Habermas) as intrinsically valuable, then preferences need not necessarily be reshaped in the discussion setting. Indeed, for Habermas,[31] it is the achievement of consensus or agreement that is the goal of deliberation, not necessarily influencing others. Yet, the connection between deliberation as a process by which minds are changed (and thus decisions come out differently than they would in the absence of deliberation) and the enhancement of social welfare is rather clear: quite simply, deliberation *matters* insofar as individuals come into this setting with both a willingness and the means to communicate, advocate, and ultimately to become persuaded with others and by others.

There are a number of additional conditions that, while prominent in the literature, are not part of our focus in this Article. We nonetheless pause to consider them briefly, since a comprehensive case for or against deliberation as social welfare enhancing would have to take them into

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28. Cohen, *supra* note 17.

29. John Ferejohn, *Instituting Deliberative Democracy*, *in* NOMOS XLII: DESIGNING DEMOCRATIC INSTITUTIONS, *supra* note 11, at 75, 82.

30. Adam Przeworski, *Deliberation and Ideological Domination*, *in* DELIBERATIVE DEMOCRACY, *supra* note 17, at 140-60.

31. *See generally* Kenneth Baynes, *Habermas, Jurgen*, *in* 4 ROUTLEDGE ENCYCLOPEDIA OF PHILOSOPHY 193 (Edward Craig ed., 1998).

account. The first is described most eloquently by Joshua Cohen. He notes that, in deliberative settings, participants must "regard one another as equals; they aim to defend and criticize institutions and programs in terms of considerations that others have reason to accept, given . . . that those others are reasonable; and they are prepared to cooperate in accordance with the results of such discussion . . . ."[32] Or as Amy Guttman and Dennis Thompson put it, deliberation must "aspire to a kind of political reasoning that is mutually justifiable."[33]

This expectation of public reasoning and the advancement of the common good echoes, of course, John Rawls' stylized discussion setting; it also resonates with Habermas's notion of the ideal speech situation. As noted by Habermas, the very structure and process of communicative action that he proposes "grounds the presumption that reasonable or fair results are obtained."[34] According to Habermas's principles of discourse ethics, his model of deliberative democracy is valid if and only if the public is capable of making (*and willing to make*) political decisions that advance the common good.[35]

Second, and more pertinent for our argument here, is what John Ferejohn describes as institutional requisites for epistemic deliberation.[36] While not advocating deliberation as a social choice process, Ferejohn shrewdly unpacks the institutional conditions for deliberation, where deliberation aims to improve the quality of decision-making in group settings. Ferejohn first describes the imperative of having adequate *enforcement institutions*, that is, institutions require that "public decisions can be seen as jointly made" and thus individuals in these settings will accord proper legitimacy to outcomes, regardless of whether and to what extent they actually participated in the discursive process.[37] Next, given the ubiquitous problems of coordination and collective action, it is crucial that a process be defined ex ante that makes clear "just what is required of each individual in order to implement the decision."[38] Implementation, Ferejohn reminds us, is critical; and the enhancement of

32. Joshua Cohen, *Procedure and Substance in Deliberative Democracy*, in DEMOCRACY AND DIFFERENCE, *supra* note 9, at 95, 100.

33. GUTTMAN & THOMPSON, DEMOCRACY AND DISAGREEMENT, *supra* note 10, at 53.

34. *See* Baynes, *supra* note 31.

35. Matthew Weinshall, *Means, Ends and Public Ignorance in Habermas's Theory of Democracy*, 15 CRITICAL REV. 29 (2003).

36. *See generally* Ferejohn, *supra* note 29.

37. *Id.* at 88-90.

38. *Id.* at 89.

social welfare requires not merely agreement at the end of the deliberation setting, but, as well, agreement about what comes next and how these reasoning individuals will play their respective parts. Third, "public decisions are typically made at a level of generality that requires interpretation before the decision can be applied to particular cases;" that is, they "have an irreducibly creative aspect" that may be unanticipated at the time the decision is made.[39] An institutional framework is important to settle disputes that may arise ex post about the meaning to be accorded to these group decisions.

In addition to these enforcement decisions, Ferejohn emphasizes that decisionmaking and deliberative institutions are also essential for reasoning citizens to create before entering into deliberative processes.[40] The nature and configuration of these institutions—or, more fundamentally, the insight that these institutions are essential elements in the deliberative model—are of interest to us in our empirical evaluation of deliberation, for these processes bear on the likelihood that the communicative process can properly take place given the structure of incentives and the costs of deliberating. As we explain below, one of the requisites of deliberation in all extant theories of that enterprise is the ability to communicate freely with one another. Introducing, then, a mechanism such as, say, a secret ballot confounds this free communication condition.[41] Other institutional mechanisms may have this quality as well. The point we stress here is that the main conditions for deliberation as described by political theorists must be, for the reasons Ferejohn and others emphasize, augmented by attention to institutions and the basic insight from economics, that is, the condition of scarcity.

## III. DELIBERATION IN A REALISTIC SETTING

### *A. Experimenting with Deliberation*

The social-welfare argument for deliberation rests on a stylized version of deliberation, one in which individuals are configured into a group setting and are given instructions about what issues are before them for discussion and resolution. As already discussed, the conditions for this deliberation are elaborate. The key condition that we focus on in our experiment is communication and, more specifically, the ability and willingness of similarly incentivized individuals to speak, listen, and

39. *Id.*

40. *Id.* at 90-96.

41. *See, e.g.*, Daniel B. Rodriguez, *Straw Polls*, 12 J. CONTEMP. LEGAL ISSUES 791, 798 (2002).

learn in group settings where such activities would improve decision-making outcomes (that is, improve social welfare).[42]

The experiment described in what follows is configured to represent a simple setting in which discussion among equally motivated individuals would unquestionably enhance both individual and social welfare. Thus, the experiment's design and, further, the experimental results described herein, are close analogies to scholars' theories of deliberation. Specifically, they incorporate the costs associated with speaking and listening in a collective setting. To preview our ultimate conclusion, our experiments demonstrate that when speaking and listening are costly, deliberation does not improve social welfare, but rather, decreases it. Given this surprising result, we then investigate whether deliberation has different

42. There is now a large literature devoted to analyzing group decisionmaking, much of which we build upon in this study. Indeed, in addition to several other studies of deliberation, *see* generally Eric S. Dickson, Catherine Hafer & Dimitri Landa Cognition and Strategy: A Deliberation Experiment (NYU Working Paper, 2005), *available at* http://www.nyu.edu/gsas/dept/politics/faculty/landa/ExperimentPaper.pdf; Adam Meirowitz, In Defense of Exclusionary Deliberation: Communication and Voting with Private Beliefs and Values (Yale Working Paper, 2004), *available at* http://www.yale.edu/leitner/delib_jtpn.pdf; John Patty, Arguments-Based Collective Choice, (Working Paper, 2005), *available at* http://www.peoplefair.harvard.edu~web.pdf. There also exist common pool resource experiments, which assess levels of cooperation in group settings. *See generally* ELINOR OSTROM, ROY GARDNER & JAMES WALKER, RULES, GAMES, AND COMMON-POOL RESOURCES (1994); Peter Kollock, *Transforming Social Dilemmas: Group Identity and Co-operation*, *in* MODELING RATIONALITY, MORALITY, AND EVOLUTION 185 (Peter A. Danielson ed., 1998); Elinor Ostrom, *Collective Action and the Evolution of Social Norms*, 14 J. ECON. PERSP. 137 (2000); Bradley J. Ruffle & Richard Sosis, *Cooperation and the In-Group-Out-Group Bias: A Field Test on Israeli Kibbutz Members and City Residents*, 60 J. ECON. BEHAV. & ORG. 147 (2006); David Sally, *Conversation and Cooperation in Social Dilemmas: A Meta-Analysis of Experiments from 1958 to 1992*, 7 RATIONALITY & SOC'Y 58 (1995) [hereinafter Sally, *Conversation and Cooperation*]; David Sally, *On Sympathy and Games*, 44 J. ECON. BEHAV. & ORG. 1 (2001) [hereinafter Sally, *On Sympathy*]. In these common pool resource experiments, scholars are typically interested in individuals' willingness to cooperate or contribute to the common good, and they often find that subjects are more willing to cooperate if there exists some form of group identity among the members. *See* Kollock, *supra*; Ruffle & Sosis, *supra*. Such group identities are typically formed when subjects share similar backgrounds, memberships in clubs, clans, or groups, or have some other core feature in common. In the deliberative settings that many scholars advocate, however, there is little or no opportunity to develop such group identities, as hundreds of citizens from many different backgrounds, religions, etc. will be brought together to deliberate for a short amount of time. For this reason, we do not take steps to foster a group identity in our experiments, aside from offering subjects a $10 bonus if they all coordinate on the correct answer to the math problem.

effects on social welfare in small versus large groups. Our results demonstrate that even in groups as small as four people, deliberation does not improve social welfare. Further, when the number of individuals in a group increases to eight, nine, ten, twelve, or fifteen participants, then deliberation again brings about significant declines in social welfare, with larger groups suffering larger declines.

Of course, the results of this experiment do not offer the ultimate rebuttal to social welfare claims for deliberation, whether in its idealized version or in more realistic rubrics. Yet, we offer this simple experiment and the remarkable results yielded as a challenge to those who argue for deliberation on social welfare grounds. The issue is not only one of political theory. Rather, arguments for deliberation in decisionmaking settings compete with other models of social choice, including so-called aggregative (i.e., voting) models and, as we discuss briefly in our conclusion, expertise models of collective decisionmaking.

### *B. The Structure of Our Experiments*

We designed our laboratory experiments with two goals in mind. First, we wanted our experiments to be close analogies to scholars' models of deliberation. Second, we sought to maintain a controlled environment that would allow us to make internally valid inferences. However, because the literature has yet to converge upon a single model of deliberation,[43] and because it is difficult to conduct a controlled experiment while allowing subjects to communicate with one another, we were forced to focus on one particular type of deliberation in our experiments. In what follows, we describe the basic structure of our

43. *See, e.g.*, DAVID AUSTEN-SMITH & TIMOTHY J. FEDDERSEN, DELIBERATION, PREFERENCE UNCERTAINTY AND VOTING RULES (2005); CATHERINE HAFER & DIMITRI LANDA, DELIBERATION, IDEOLOGICAL BIAS, AND GROUP CHOICE (2005) [hereinafter HAFER & LANDA, IDEOLOGICAL BIAS]; Cohen, *Deliberation and Democratic Legitimacy*, *supra* note 3, at 67-92; Dickson, et. al., *supra* note 42; Meirowitz, *supra* note 42; Patty, *supra* note 42; Randall Calvert & James Johnson, *Rational Actors, Political Argument, and Democratic Deliberation* (Am. Pol. Sci. Assoc. Working Paper, 1998), *available at* http://www.artsci.wustl.edu/~polisci/calvert/downloads/arguments.v12.pdf; Dino Gerardi & Leeat Yariv, *Putting Your Ballot Where Your Mouth Is: An Analysis of Collective Choice With Communication* (UCLA Working Paper No. 27, 2002), *available at* http://www.econ.ucla.edu/workingpapers/wp827.pdf; Catherine Hafer & Dimitri Landa, *Deliberation as Self-Discovery and Institutions for Political Speech*, J. THEORETICAL POL. (forthcoming 2006); *available at* http://www.nyu.edu/gsas/dept/politics/faculty/landa/Deliberation.pdf; Barton L. Lipman & Duane J. Seppi, *Robust Inference in Communication Games with Partial Provability*, 66 J. ECON. THEORY 370 (1995).

experiments,[44] noting throughout how various aspects of our experimental design correspond to key features of scholars' models of deliberation.[45]

In our experiments, subjects[46] are asked to deliberate about the answers to math problems about which they are uncertain (that is, subjects do not necessarily know the correct answers to the math problems).[47] These math problems are drawn from an SAT II, level two math test, and subjects are asked to make a series of binary choices about them: first, subjects may choose to answer a problem or leave it blank; second, if they decide to answer a problem, then they may choose

44. The protocols and handouts used in these experiments, as well as the results, are available from the authors.

45. *See* Table 1 for a complete listing of the links between our experiments and scholars' theories of deliberation.

46. Note that our subjects are college undergraduates who are over the age of 18 and who are enrolled in classes at the University of California, San Diego. When recruiting these subjects, we posted flyers at various locations on campus (for example, in front of the library, in the cafeterias, in the dormitories, and in academic buildings), and we also sent out campus-wide emails to advertise the experiments.

47. That subjects do not necessarily know the correct answers to the math problems ensures that our experiments capture a key feature of deliberation—namely, the ability of participants to change their minds or to correct their beliefs about the right answer to the question. Indeed, Ian Shapiro underscores the importance of flexible preferences for successful deliberation when he states:

> Typically, the motivating thought [among scholars of deliberation] is that people do not always have unalterable, or even well-formed, desires, so that understanding what others want, and why, can lead to adaptation of preferences in mutually compatible ways. The assumption is that if people talk for long enough in the right circumstances they will eventually be brought to agree, and that this is a good thing.

Ian Shapiro, *Optional Deliberation?*, *in* DEBATING DELIBERATIVE DEMOCRACY, *supra* note 2, at 123.

TABLE 1. CORRESPONDENCE BETWEEN THEORIES OF DELIBERATION AND OUR EXPERIMENTS

| **Theoretical Condition** | **Examples of the Theoretical Condition** | **Experimental Condition** |
|---|---|---|
| *Common Interests* | Ackerman & Fishkin[48] | Earning a $10 bonus if everyone answers a problem correctly. |
| *Reasoning* | Ackerman and Fishkin;[49] Cohen & Fung; [50] Sanders;[51] Ackerman[52] | In one version of our experiments, subjects exchange reasons (proofs) for choosing answer "a" or answer "b". |
| *Consensus/Unanimity* | Cohen;[53] Manin [54] | Common interests with significant incentives to reach a unanimous decision: If even one subject gets the problem wrong or leaves it blank then all subjects miss out on the $10 bonus. |
| *Equality* | Cohen;[55] Cohen & Fung[56] | Subjects' personal characteristics (i.e., gender, race, appearance, voice, etc.) are in no way linked to the statements that they make; therefore, all subjects' statements are treated equally. |

48. Ackerman & Fishkin, *supra* note 2.
49. *Id.*
50. Joshua Cohen & Archon Fung, *Radical Democracy*, 10 SWISS J. POLI. SCI. 23 (2004), *available at* http://www.archonfung.net/ papers/Cohen_Fung_Debate_ SPSR2004.pdf.
51. *See* Lynn M. Sanders, *Against Deliberation*, 25 POL. THEORY 347 (1997).
52. Ackerman & Fishkin, *supra* note 2.
53. Cohen, *supra* note 3.
54. Manin, *supra* note 10.
55. Cohen, *supra* note 3.
56. Cohen & Fung, *supra* note 50.

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|---|---|---|
| *Uptake & Engagement of Information* | Goodin[57] | After receiving information, subjects have 60 seconds to choose their final answer. |
| *Minds are Changed* | Shapiro[58] | Subjects may change their answers. |
| *Opportunities to Exchange Accurate Information* | Ackerman & Fishkin[59] | Subjects may send and receive the correct answers to the math problems. |
| *Choosing from a Menu of Solutions* | Knight & Johnson[60] | Subjects may select anser "a" or answer "b". |
| *Reduced Density of Information* | Goodin[61] | Subjects send and receive signals in the form of answer "a" or answer "b". |
| *Minds are Changed* | Shapiro[62] | Subjects may change their answers. |

either answer "a" or answer "b" as the correct answer.[63] Subjects have 60 seconds to answer each math problem, and they earn $1 for every problem that they answer correctly, they lose $1 for every problem that they answer incorrectly, and they neither earn nor lose money if they choose not to answer the problem. In later trials, subjects are also told

57. Robert E. Goodin, *Democratic Deliberation Within*, *in* DEBATING DELIBERATIVE DEMOCRACY, *supra* note 2, at 54.

58. Shapiro, *supra* note 47.

59. Ackerman & Fishkin, *supra* note 2.

60. Jack Knight & James Johnson, *Aggregation and Deliberation: On the Possibility of Democratic Legitimacy*, 22 POL. THEORY 277 (1994).

61. Goodin, *supra* note 57.

62. Shapiro, *supra* note 47.

63. Note that this aspect of our experiment captures two key features of scholars' models of deliberation: 1) having participants choose from a menu of solutions and 2) reducing the density of information. For example, Knight and Johnson emphasize that choosing from a menu of options is a key element of deliberation when they state: "[Deliberation] is not merely conversation. Contrary to the views of some of its advocates, argument and debate, in our view, constitute precisely and non-pejoratively 'a deliberative preliminary to the act of choosing' from among solutions to contested political problems." Knight & Johnson, *supra* note 60, at 286 (emphasis omitted). As for reduced density of information, this aspect of deliberation is captured in Goodin's notion of "emaciated deliberation." Goodin, *supra* note 57, at 59. Specifically, he notes that "'[E]maciated deliberation' . . . facilitates mass deliberation by reducing the density of the signals and hence the deliberative load each participant has to bear." *Id.*

that they make an additional $10 each if they all choose the correct answer to a math problem[64] (i.e., if even one subject gets a problem wrong or leaves it blank, then they all miss out on the $10 bonus), which establishes strong common interests among them.[65] Indeed, the experiment is purposefully structured to encourage the subjects to reach consensus, which is one of the goals that Habermas and many others have attributed to deliberation.[66] For example, Habermas emphasizes that "[t]he goal or 'telos' of communicative action is not expressed or realized in an attempt to influence others, but in the attempt to reach an agreement or mutual understanding (*Verstandigung*) about something in the world."[67]

In addition to large incentives for unanimous decisions, the existence of a single correct answer reduces the likelihood of intra-group conflict. These two conditions then establish the ideal conditions for deliberation to work; that is, every subject's interests are aligned. We consider successful deliberation to have occurred when all subjects choose the correct answer to a math problem.

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64. Note that we do not reward subjects for coordinating on the wrong answer to a math problem, as this seems to be at odds with the core objective of deliberation. Stated differently, scholars do not advocate deliberation (and emphasize the importance of reaching a consensus) because they want citizens to arrive at the wrong policy choices, but rather because they want them to choose the "correct" or social welfare-enhancing policy. Further, rewarding subjects for coordinating on both the correct and incorrect answers makes our simple communication game between the senders and receivers much more difficult to solve.

65. Common interests among participants is a core feature of many models of deliberation. As Ackerman and Fishkin note: "When . . . [deliberating] . . . Americans will be not encountering one another as consumers or coreligionists or even friends—but as citizens searching for common ground, engaged in the great task of reconstructing a thin but precious civic bond that ties us all together in a common enterprise." Ackerman & Fishkin, *supra* note 2, at 22.

66. Defining successful deliberation as the unanimous agreement individuals in a group is common in the deliberation literature. For example, Manin emphasizes that "[t]he principal arguments that have been proposed seek, in effect, to define social rules capable of bringing about the unanimous agreement of individuals." Manin, *supra* note 10, at 338. Similarly, Cohen contends that "ideal deliberation aims to arrive at a rationally motivated consensus- to find reasons that are persuasive to all who are committed to acting on the results of a free and reasoned assessment of alternatives by equals." Cohen, *supra* note 3, at 75. Although previous models and empirical tests of deliberation have modeled deliberation as majority decision-making, this choice does not seem to capture what deliberative theorists have in mind. In fact, if all deliberative theorists propose is majority decision-making with subject-area experts then many of our current political institutions (i.e., Congress, elections, Court system) should already be considered deliberative. Because we do not believe this is what deliberation's advocates have in mind we model the decision rule as unanimity.

67. *See* Baynes, *supra* note 31, at 145.

In various treatment settings, which we describe below, we allow the subjects to deliberate, and therefore, the conditions of the deliberation form the various treatments applied. Specifically, we allow subjects to exchange information about the math problem on which they are working,[68] and because we require all subjects to sit behind partitions and to communicate via sheets of paper, we ensure that everyone's statements are treated equally.[69] Indeed, throughout our experiments (and as in idealized models of deliberation), subjects' personal characteristics (i.e., their gender, race, appearance, voice, etc.) are in no way linked to the statements that they make and, therefore, cannot influence the weight that their statements are given.

So, when solving each math problem in the experiment, each subject has the chance to make an anonymous statement to the other subjects (i.e., send a signal about whether they recommend answer "a" or answer "b" as the correct answer to a math problem), and each subject can also choose to listen to an aggregation of the signals that the other subjects sent.[70] This aggregation of signals consists of information about the total number of subjects in the room, the number of subjects who chose to recommend answer "a," and the number of subjects who chose to recommend answer "b." After deciding whether to send a recommended answer to the other subjects and after deciding whether to receive

68. Note that this satisfies the requirement that participants in deliberation have opportunities to exchange accurate information. Indeed, Ackerman and Fishkin emphasize that: "[Deliberation requires] that there be opportunities for reasonably accurate information to enter the dialogue. Some reasonable level of completeness and of accuracy is required for deliberative discussion to take place." Ackerman & Fishkin, *supra* note 2, at 27.

69. It has been suggested to us that, instead of conducting a controlled experiment in which subjects communicate via sheets of paper, we should simply put 12 individuals in a room and allow them to speak and listen to one another freely. However, such a procedure would prevent all individuals' statements from being treated equally and would devolve into an expertise system in which the subjects who are good at math speak and the subjects who are poor at math listen. While we believe that such an expertise system is an effective way to improve social welfare, we also emphasize that it is *not deliberation*. For further discussion of this point, see *infra* Part IV.

70. We aggregate the signals at this point to avoid the chance that one or two subjects could develop a reputation for mathematical sophistication/expertise; later we plan to vary this and allow individuals to develop reputations. Specifically, we will eventually allow subjects to link their SAT math scores to their recommendations about whether "a" or "b" is the correct answer to a given math problem.

information about other subjects' recommended answers, subjects then have 60 seconds to choose their final answer to the math problem.[71]

Because we pay subjects each time that they, individually, answer a math problem correctly and each time that they all coordinate on the correct answer, our experiments yield a straightforward measure of social welfare: the average amount of money that subjects earn in each experimental condition. So, for example, if subjects are deliberating successfully (i.e., coordinating on the correct answers to the math problems), then we should observe higher payoffs per subject (i.e., increasing social welfare), as all of the subjects are earning $1 for solving the problem correctly and earning an additional $10 because all of the other subjects also solved the problem correctly. By contrast, if subjects are unable to deliberate successfully, then a lower amount of social welfare should be generated, as subjects will not earn an additional $10 and some may not earn $1 for solving the problem correctly.

In order to identify whether and under what conditions deliberation improves social welfare, we compare the average amounts of money that subjects earn when solving the math problems under each of the following five treatment conditions:

1. **No Communication**: Subjects must choose their answers completely on their own and without any communication. This is the control setting.
2. **Deliberation and Free Speech**: Subjects may send information to the other subjects about what they recommend as the correct answer, and subjects may also receive information about what others recommend as the correct answer. In this condition, sending and receiving information are costless. Indeed, we argue that such sending and receiving are as close to costless as possible, given that there are no opportunity costs because subjects have to sit through the experiment even if they are not sending or receiving information.
3. **Deliberation with Costly Speech**: Subjects may send information only if they pay a $2 cost, but they may still receive information for free. This is analogous to deliberation

71. By giving subjects 60 seconds to choose their final answers, we allow for what Goodin dubs the "uptake and engagement of information." Specifically, he emphasizes that "[t]here must also be uptake and engagement—other people must hear or read, internalize and respond—for that public-sphere activity to count as remotely deliberative." Goodin, *supra* note 57, at 60.

with costly signaling, as is typical in economic models of communication.

4. **Deliberation with Costly Listening**: Subjects may send information for free, but they must pay a $2 cost to receive information. This is analogous to economic models of consumer choice, where consumers must buy information.
5. **Deliberation with Costly Speech and Costly Listening**: Subjects must pay a $2 cost to send *and* receive information. This is analogous to real world deliberation, where there are suppliers and consumers of information.

In addition to varying the conditions under which subjects solve the math problems, we also vary the size of the groups in which subjects deliberate. Specifically, for each of the above conditions, we use groups that consist of four, eight, nine, ten, twelve, or fifteen subjects. While we begin with a few example questions, after which the subjects are paid their earnings, subjects accumulate payoffs during the experiment and are not paid until the end of the experiment (where their answers and others are shown to them and their payoff tabulated for them). This makes it impossible for subjects to learn about the other subjects through repeated trials and assures independence of trials. We then analyze whether deliberation can improve social welfare for groups of different sizes under different conditions.

### *C. Hypotheses*

The basic structure of our experiments yields several predictions about the conditions under which deliberation will (and will not) improve social welfare. Indeed, because we have established the ideal conditions for deliberation in that subjects in our experiments have common interests with one another (recall that each subject in the experiment earns an additional $10 if every other subject in the room solves a particular problem correctly), all subjects have an incentive to answer the math problems correctly. For this reason, they also have an incentive to reveal truthful information to one another about what they recommend as the correct answers to the math problems.[72] Thus, we propose the following hypotheses:

72. *See* Vincent P. Crawford & Joel Sobel, *Strategic Information Transmission*, 50 ECONOMETRICA 1431 (1982); *see generally* LUPIA & MCCUBBINS, *supra* note 15, at 48-49.

**Deliberation and Free Speech Hypothesis**: If speaking and listening are costless, then deliberation will improve social welfare, relative to the amount of social welfare that is generated in our "No Communication" control condition.

The reasoning behind this prediction is straightforward: Because subjects have common interests with one another and because it is costless to send information, subjects who know the correct answer to particular math problems should make truthful recommendations,[73] while subjects who do not know (or are unsure about) the correct answer should remain silent. Further, because receiving information is also costless in this condition, all subjects should choose to receive the aggregation of recommended answers.[74] Given that subjects receive this aggregation before choosing their final answer to the math problems, we predict that they will be better able to coordinate on the correct answers to the math problems and that social welfare will, therefore, increase.

**Deliberation with Costly Speech Hypothesis**: If individuals must pay a cost to speak (but not to listen), then deliberation will improve social welfare, relative to the amount of social welfare that is generated in our "No Communication" control condition.

The logic behind this prediction is, again, straightforward: Because receiving information is still costless in this condition, all subjects should choose to receive the aggregation of recommended answers. Knowing that all subjects should choose to receive this aggregation, subjects who are certain (or fairly certain) about the correct answer to the math problem should pay $2 to recommend an answer to the other subjects.[75] The reason for this, of course, is that all subjects have common interests with one another; thus, subjects who know the correct answer to a math problem may benefit financially if they share that answer with the other subjects. Specifically, these subjects will earn $1 if they themselves answer the problem correctly, and they also have a chance to earn an additional $8 (i.e., the $10 bonus minus the $2 that

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73. Indeed, both Lupia and McCubbins and Crawford and Sobel demonstrate that, in equilibrium, common interests induce trustworthy statements. *See* LUPIA & MCCUBBINS, *supra* note 15, at 17-38; Crawford & Sobel, *supra* note 72, at 1431-51. Players who know the answer to a problem have a dominant strategy to recommend an answer. For players who are uncertain, the choice to recommend an answer depends upon their beliefs about the probability they are correct in their recommendation, relative to their beliefs about everyone else's probability of answering correctly.

74. The equilibrium expectations for senders and receivers are, in fact, what we observe in the experiments.

75. Again, we observe these predictions to be valid in our experiments.

they paid to recommend their answer) if all of the other subjects in the room answer the problem correctly. Note also that, for subjects who choose to receive information, the fact that subjects paid $2 to send their recommended answers increases the credibility of those recommendations, as is the case in economic models with costly signaling.[76] It follows from this that the subjects who know the answer, and only these subjects, will recommend the correct answer. All other subjects will listen and will then be able to follow the recommendation and choose the correct answer. This heightens every player's ability to choose the correct answer and so it should cause an improvement in social welfare under this condition.

> **Deliberation with Costly Listening Hypothesis**: If individuals must pay a cost to listen (but not to speak), then deliberation will not improve social welfare, relative to the amount of social welfare that is generated in our "No Communication" control condition.

The reasoning behind this prediction is simply that, if we model only the actions of the receivers, it reduces to a multi-person dilemma game.[77] The key simplification to multi-person dilemma games is the assumption that each player has a purely binary choice, and that the interaction is impersonal in the sense that each player's payoff depends only on the number of others making the one choice or the other, and not on the identities of these choosers (i.e., it is an anonymous function).

In modeling the experiment, the receiver's choice can be simplified to be either 1) pay the cost and to receive the signal (in which case the dominant strategy will be to answer the problem and to choose the answer indicated by the signal, as only knowledgeable players will choose to signal and their dominant strategy is to send the correct answer to the receivers) or 2) to not pay the cost and not receive the signal. If players choose not to pay the cost to receive the signal, they then must choose whether to answer the problem on their own (according to their prior beliefs regarding the correct answer) or not to answer the problem and sit out the game.

Because the probability that a particular receiver will be pivotal, and will thus bring about the collective bonus by his or her decision to

76. *See* LUPIA & MCCUBBINS, *supra* note 15, at 54.

77. *See generally* THOMAS C. SCHELLING, MICROMOTIVES AND MACROBEHAVIOR (1978).

acquire information, goes to zero as the size of the group increases,[78] the choice for receivers boils down to whether the *private benefit* of receiving information exceeds the cost. Specifically, the private benefit of receiving information in our experiments is equal to $1 minus the expected value of their answer based on the participant's subjective beliefs. In our experiments this private benefit of receiving information therefore cannot exceed $1. It follows that a subject's subjective probability of being pivotal has to exceed one-fifth, which seems unlikely even in groups as small as four (if you are in a group of four and you as the subject believe that everyone else has a 50-50 chance of answering the problem correctly, and thus making you pivotal, then only once in eight trials will you actually be pivotal).

Consistent with this logic is the key result of multi-person dilemma games: that non-contribution is the dominant strategy. In our setting, this means that players will refuse to acquire information about the correct answer to the math problem.[79] Note that this result is consistent with much of the literature on attention, which suggests that individuals' decisions about whether to pay attention to new information are net benefit calculations and that people ignore most stimuli in their environment.[80] It is also a fairly intuitive result, once we consider the contradictory beliefs that an individual must hold in order to think that he or she will benefit from paying to receive information (for more on the logic here, see the Appendix). As a consequence, a consensus will only be reached by chance.

**Deliberation with Costly Speech and Costly Listening Hypothesis**: If individuals must pay a cost to speak *and* listen, then deliberation

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78. See the Appendix for further details on this point.

79. We modeled a more complicated, two-person version of the receivers' game in Richard D. McKelvey, Andrew M. McLennan & Theodore L. Turocy, *Gambit: Software Tools for Game Theory*, Version 0.2006.01.20 (2006), *available at* http://econweb.tamu.edu/gambit (last visited Apr. 24, 2006). In a game of incomplete information, Nature moves first to decide if the correct answer is "a" or "b". Then player one chooses to pay to listen to a signal or not. If she chooses to listen, then she is assumed to automatically choose the answer, "a" or "b," that she is told in the signal she receives. If she chooses not to listen, then she must first choose whether or not to answer at all and if she chooses to answer, she then picks "a" or "b" based on her prior beliefs. Player two then follows the same set of choices in the same order. Neither player knows what the other player did. Payoffs are as defined in the experimental setup. There are three equilibria to this game, none of which involve either player acquiring information. For the speakers, they have a dominant strategy to tell the truth, if they choose to speak. Speakers, however, will not speak if no one is listening. The interested reader may contact Mathew D. McCubbins at mmccubbins@ucsd.edu for further details.

80. *See* LUPIA & MCCUBBINS, *supra* note 15, at 17-38.

will not improve social welfare, relative to the amount of social welfare that is generated in our "No Communication" control condition.

As the above hypothesis suggests, we also do not expect to see improvements in social welfare under the condition that we argue is most similar to real world deliberative settings—namely, our "Deliberation with Costly Speech and Costly Listening" condition. Indeed, when speaking and listening are costly, we do not expect to observe many instances of successful deliberation, for reasons that are similar to the ones just described. Specifically, because there does not exist a pure strategy equilibrium in which individuals pay $2 to receive information, then individuals who know the correct answer to the math problem should not be willing to pay $2 to send recommended answers.[81] Stated differently, if one's recommended answers are simply going to fall on deaf ears, then why pay the cost to recommend an answer in the first place? For this reason, we do not expect to see improvements in social welfare under this condition.

**Group Size Hypothesis**: As the number of individuals in a deliberative group increases, then social welfare will decrease, all else constant.

We also expect that varying amounts of social welfare will be generated in different size groups. Specifically, as long as each individual's probability of correctly answering a particular math problem is less than 1, we predict that as the number of individuals in the group increases, the amount of social welfare that is generated will decrease. The logic behind this prediction is simply that individuals' expected payoffs for each math problem are, in part, determined by the product of each

81. Note that Dickson, Hafer, and Landa find that subjects "overspeak" in their experiments; that is, they communicate twice as often as we would expect them to speak in equilibrium. *See* Dickson, et. al., *supra* note 42, at 15. In our experiments, we also find evidence of overspeaking because subjects pay to send recommended answers even when, in equilibrium, we do not expect *any* subjects to bear the cost associated with speaking. This similarity between Dickson, Hafer, and Landa's results and our own results is quite interesting, especially since the structure of their experiments is far different from our own. Specifically, Dickson, Hafer, and Landa conducted majority rule voting experiments in which subjects could *either* speak or listen. *See id.* at 2. Thus, their experiments are more like an expertise system (and less like an ideal deliberative setting) than our own.

individual's probability of answering the problem correctly multiplied by the $10 bonus that they can earn if they all coordinate.

### *D. Results*

As the results of our experiments demonstrate, the data support each of our predictions. For example, when subjects may send and receive information for free, they generate a significantly greater amount of social welfare than do subjects in our "No Communication" control condition. Specifically, each subject in our "Deliberation and Free Speech" condition earned, on average, $5.53 per problem, while subjects who were not allowed to communicate earned, on average, $1.42 per problem. As shown in Table 2, a simple difference of means test reveals that this $4.11 increase in social welfare is statistically significant ($p = 0$).

Our prediction that improvements in social welfare will occur when subjects must pay a $2 cost to send information (but may receive information for free) is also confirmed by our data. Indeed, turning again to Table 2, we find that subjects in this condition earned, on average, $3.22 per problem. When compared with the $1.42 that subjects in the control condition earned, this $1.80 increase in social welfare (though not as large an increase as the one that we observed in the "Deliberation and Free Speech" condition) is also statistically significant ($p = 0$).

As for the conditions under which we did *not* expect to observe improvements in social welfare (i.e., the "Deliberation with Costly Listening" and the "Deliberation with Costly Speech and Costly Listening" conditions), our predictions are again confirmed, with the addition of one unanticipated finding. First, as expected, there was no improvement in social welfare when subjects had to pay a $2 cost to receive information, but could speak for free.[82] Indeed, the $1.09 that

82. We also ran a version of this experiment in which subjects only had to pay $1 to receive information. Although such a reduction in the cost of receiving information increases the expected net benefit associated with receiving such information, subjects still, by and large, chose not to pay to receive information. Further, such a reduction in the cost of information did not enable subjects to deliberate successfully and to achieve the collective bonus.

Note also that the results of our "$1 cost to receive information" experiments point to another finding that is important in the literature on deliberation. Specifically, to the extent that scholars emphasize the participatory benefits of deliberation, our findings suggest that such benefits will not exist uniformly, that many (most) citizens will simply refuse to participate in a deliberative exercise, even if you pay them. The idea that we can establish juries, large and small, across the country, for every type of decision, to negotiate every different plan of actions, every policy, and every election, would be

each subject earned per problem in this condition is statistically indistinguishable from the $1.42 that subjects in the control condition earned (see Table 2).

As for our results for the "Deliberation with Costly Speech and Costly Listening" condition,[83] we discovered something a bit surprising, not to mention disconcerting—that deliberation under this condition actually leads to a significant *decrease* in social welfare, relative to the control group. Specifically, subjects in this condition earned $1.09 *less* than subjects in the control group (see Table 2). Given that this experimental condition is most similar to real world deliberative settings, this result suggests that scholars' assumption that deliberation will improve social welfare is unfounded. It further suggests that while deliberation may seem desirable in theory, it is detrimental in practice.

Given this result that deliberation leads to significant decreases in social welfare under realistic conditions, we then examined whether this result holds for all group sizes. The reason that we conducted such an analysis, is that our aggregate results could be masking nuances in the data—namely, the possibility that deliberation under realistic conditions increases social welfare as the number of individuals in the group decreases. Thus, we broke our results down to examine whether deliberation under realistic conditions increases social welfare in smaller size groups.

tantamount to calling citizens to jury service 200 times per year, or more—as well as time—is, needless to say, limited.

83. Note that we also ran a version of this experiment in which subjects only had to pay $1 to send information and $1 to receive information. Even with such a reduction in the costs of sending and receiving information, most subjects still chose not to pay to send and receive information. Further, reducing the cost of sending and receiving information to $1 did not enable subjects to deliberate successfully and earn the collective bonus.

TABLE 2. SOCIAL WELFARE BY EXPERIMENTAL CONDITION*

| **Experimental Condition:** | **Amount of Money Earned Per Problem, Per Subject:** | **Average Increase in Money Earned (Relative to Control):** |
|---|---|---|
| *No Communication (Control) (N =120)* | $1.42 | — |
| Free Communication *(N = 120)* | **$5.53 (P = 0)** | **$4.11 (P = 0)** |
| *$2 Cost to Send Information (N = 58)* | **$3.22 (P = 0)** | **$1.80 (P = 0)** |
| *$2 Cost to Receive Information (N=58)* | $1.09 | $-0.33 |
| *$2 Cost to Send and Receive Information (N = 82)* | **$0.33 (P = 0)** | **$-1.09 (P = 0)** |

*Boldface indicates a significant difference, relative to the no communication condition.

As the results in Table 3 demonstrate, however, deliberation still does not improve social welfare even in groups as small as four people. Indeed, when we compare the amount of social welfare that a group of four subjects generated in the control condition (i.e., $1.36 per subject, per problem) with the amount of social welfare that a group of four subjects generated in our "Deliberation with Costly Speech and Costly Listening" condition (i.e., $1.79 per subject, per problem), we see that there is not a statistically significant difference between these two amounts of social welfare. This finding is, of course, an improvement over our aggregate result (namely, that deliberation under realistic conditions decreases social welfare), but notice that once the group size increases to eight, nine, ten, twelve, or fifteen subjects, we again see statistically significant decreases in social welfare, relative to the control group. Note also that there is a linear decline in the amount of social welfare as the size of the group increases, which is consistent with our prediction.

TABLE 3. SOCIAL WELFARE BY GROUP SIZE FOR OUR REALISTIC DELIBERATIVE SETTING*

| EXPERIMENTAL CONDITION: | GROUP OF 4 | GROUP OF 8 | GROUP OF 9 | GROUP OF 10 | GROUP OF 12 | GROUP OF 15 |
|---|---|---|---|---|---|---|
| *No Communication (Control)* | $1.36 | $2.07 | $1.95 | $1.99 | $0.38 | $1.21 |
| *$2 Cost to Send and Receive Information* | $1.79 (P = 0.12) | **$0.92 (P = 0)** | **$0.07 (P = 0)** | **$0.02 (P = 0)** | **$-0.03 (P = 0)** | **$-0.17 (P = 0)** |

*Boldface indicates a significant decrease in social welfare, relative to a particular group size in the control condition.

For comparison, we also calculated the amounts of social welfare that different size groups generate in our "Deliberation and Free Speech" condition. Consistent with our aggregate result, we find that, for each group size, subjects in this idealized deliberative condition are able to increase their social welfare, relative to the amounts of social welfare that groups in the control condition generate. However, when we look *across* the bottom row of Table 4, we see that our prediction that social welfare will decrease as the group size increases holds even in this idealized setting. That is, although not a perfectly linear pattern, we do see an overall decline in social welfare as the group size increases from four subjects to fifteen subjects. Indeed, the amount of social welfare that a group of four subjects generated (i.e., $7.29 per subject, per problem) is significantly greater than the amounts of social welfare that a group of eight, twelve, or fifteen subjects generated (i.e., $5.76, $3.06, and $4.85, respectively).

TABLE 4. SOCIAL WELFARE BY GROUP SIZE FOR THE IDEALIZED DELIBERATIVE SETTING*

| Experimental Condition: | Group of 4 | Group of 8 | Group of 9 | Group of 10 | Group of 12 | Group of 15 |
|---|---|---|---|---|---|---|
| *No Communication* | $1.36 | $2.07 | $1.95 | $1.99 | $0.38 | $1.21 |
| *Free Communication* | $7.29 | **$5.76 (P=0.004)** | $6.42 (P = 0.059) | $7.48 (P = 0.35) | **$3.06 (P = 0)** | **$4.85 (P = 0)** |

*Boldface indicates a significant decrease in social welfare, relative to the amount of social welfare generated by a group of four when communication was free.

### *E. A Postscript: More Bad News*

In the deliberative setting of our experiments, the subjects bear trivial or no costs to communicate. Relatedly, they have no clear alternatives for reaching welfare-enhancing collective decisions. We take up an alternative in the final part of this Article. But let us consider the first matter. If, as we show above, participants in this stylized experiment will not deliberate to welfare-enhancing outcomes where the incentives and opportunities for deliberation are plentiful, then what makes us think that, as we add more complex, costly decisions, decision-making will improve? Rather, the logic of our argument suggests that, as you introduce more strenuous conditions (recall the discussion in Part II above of Ferejohn's institutional conditions for deliberation), then the decision-making in deliberative settings becomes more difficult.

Among the practical difficulties that arise when the decisionmaking process within the deliberative setting becomes more difficult are decisionmaking pathologies of the usual sort. These include the problem of ambiguity; that is, how are participants going to best interpret messages from one another? The encoding-decoding problems in communicative settings are well known; and we summarize the key theses in other Articles.[84]

84. Cheryl Boudreau et al., *Symposium: Theories of Statutory Interpretation: Statutory Interpretation and the Intentional(ist) Stance*, 38 LOY. L.A. L. REV. 2131 (2005); Cheryl Boudreau et al., The Judge as a Fly on the Wall: Interpretive Lessons from

Further, in many real world deliberative settings, there will not exist an objectively correct answer to a particular problem or policy issue. The absence of an objectively correct solution further complicates the deliberative enterprise, for it is quite possible (in fact, likely) that no one in the deliberative group will have knowledge about the particular problem or issue at hand.[85] And, it is well known that in the absence of a knowledgeable individual in the group, citizens do not (and cannot) learn from one another.[86]

Additionally, the phenomenon of strategic behavior in decision-making settings is, too, an element that can stand in the way of effective deliberation and socially beneficial decisionmaking. Sure, advocates of deliberation might assume these problems away by insisting on the *normative* point that the deliberative model contemplates that individuals will behave sincerely and, moreover, that ambiguity will be clarified in the crucible of discursive debate and dialogue. However, we return to the thrust of our empirical point, and that is that deliberation experiments with conditions and processes that track rather well deliberation theorists' expectations about decisionmaking outcomes raise serious doubts that these assumptions can be squared with the real world.

## IV. EXPERTISE SYSTEMS: AN EFFECTIVE WAY TO INCREASE SOCIAL WELFARE

Having demonstrated that deliberation decreases social welfare under realistic conditions, we now briefly discuss a more effective method of

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the Positive Political Theory of Legislation, *available at* http://law.bepress.com/sandiego/lwps/pllt/art37.

85. A real world context in which all citizens in a deliberative group often lack knowledge about the issue at hand is our jury system. Indeed, in an empirical study of jurors' deliberations and comprehension of issues, a special committee formed by the American Bar Associated concluded that jurors do have significant difficulty with large volumes of data, especially when the evidence is not about a topic with which the jurors are already familiar. In one six-week trade secret case jurors reported they "felt overwhelmed by the technical nature of the evidence. . . . In post-trial interviews, some jurors could recall nothing about the voir dire, opening statements, or the antitrust aspects of the case." Special Comm. ABA Sec. Litig., Jury Comprehension in Complex Cases: Report of a Special Committee of the ABA Litigation Section 25, 25-26 (1989); *see also* Joseph Sanders, *Scientifically Complex Cases, Trial by Jury, and the Erosion of Adversarial Processes*, 48 DEPAUL L. REV. 355 (1998).

86. LUPIA & MCCUBBINS, *supra* note 15, at 55.

improving social welfare: expertise systems.[87] Unlike most deliberative settings (where all participants are expected to speak, listen, and learn from one another), the defining characteristic of an expertise system is that at least one participant has knowledge about a particular topic, and the other participants then have opportunities to learn from that knowledgeable participant's statements. For the reasons that we discuss below, an expertise system better enables individuals to improve both their own welfare, as well as the group's welfare.

We agree with Lynn Sanders[88] and Arthur Lupia[89] that expertise systems are *not* consistent with many views of deliberation, where equality among participants is a key feature.[90] Nonetheless, an expertise system is a superior method of improving social welfare because it satisfies the conditions that are required for people to learn from others. As Lupia and McCubbins[91] emphasize, learning from others will occur only if 1) people perceive that a speaker is knowledgeable and 2) people believe that that speaker is trustworthy (which will occur when the speaker has a personal reputation for being trustworthy, has common interests with the participants, or is subject to an institutional condition—such as a penalty for lying or the threat of verification—that induces trustworthy statements). Otherwise, individuals will not have an incentive to pay attention to and learn from the speaker's statements, as Lupia and McCubbins's experiments convincingly demonstrate.

As should be clear from our previous discussion, it is unlikely that these conditions for learning will be met in most deliberative settings. Indeed, because *all* participants (regardless of their level of expertise) are expected to speak and then learn from one another in most theories of deliberation, the welfare-enhancing effects of having knowledgeable individuals in the group are dampened. Further, because most deliberative settings do little to inform participants about who is knowledgeable and who is not, it is difficult for participants to identify the individuals that they should listen to and learn from. Given the opportunity costs associated with paying attention to others' statements, if people cannot discern who is knowledgeable, then they will not pay attention. Thus, even though the conditions for trust are often met in deliberative settings (as they were in our experiments because the subjects had common

87. Expert systems are defined as systems in which one or more persons outside the group are brought in to inform participants. We distinguish this from circumstances in which there are varying levels of expertise within the group.

88. *See* Sanders, *supra* note 51, at 347, 350.

89. Lupia, *supra* note 16, at 43-45.

90. *See, e.g.*, Cohen & Fung, *supra* note 50, at 23.

91. LUPIA & MCCUBBINS, *supra* note 15, at 64.

interests with one another), the inability to determine who is knowledgeable and who is not decreases social welfare.

With an expertise system, however, one or several participants in the group are established as having knowledge about a particular topic, and the other participants may then listen to and learn from their statements. As such, we expect expertise systems to improve social welfare, so long as the conditions for trust are also met.

Fortunately for us, our claim that expertise systems will improve social welfare is not simply a conjecture; indeed, experiments that are very similar in structure to our own have demonstrated the social welfare-enhancing effects of expertise systems.[92] In these experiments, subjects were also asked to solve math problems, but instead of having all subjects send and receive information to one another, these experiments revealed the correct answer to the math problem to one of the subjects (dubbed "the speaker") and then allowed the speaker to make a statement to the other subjects about the correct answer to the math problem.

As expected, when subjects are exposed to a knowledgeable speaker who is also subject to one of the conditions for trust that we mentioned above, we observe significant improvements in social welfare. Indeed, as shown in Table 5, when one subject in the group has knowledge about the correct answer to the math problem and has common interests with the other subjects, then there is a 223% improvement in social welfare, relative to the amount of social welfare that subjects in the control group generated (note that, as in our deliberation experiments, subjects in the control group solved the problems completely on their own). Further, when a knowledgeable speaker is subject to other conditions for trust, such as a penalty for lying or the threat of verification, large improvements in social welfare also occur (to the tune of a 200% increase in social welfare in the penalty for lying condition and in the verification condition). Taken together, these results demonstrate the large social-welfare enhancing effects of expertise systems.

92. Cheryl Boudreau, When Do Heuristics Help Citizens? Assessing the Conditions Under Which Heuristics Improve Decisions (2006) (unpublished manuscript, on file with author).

TABLE 5. IMPROVEMENTS IN SOCIAL WELFARE WITH AN EXPERTISE SYSTEM*

| EXPERIMENTAL CONDITION | PERCENT IMPROVEMENT, RELATIVE TO CONTROL GROUP |
|---|---|
| *Control Group* *(N = 66)* | — |
| ***COMMON INTERESTS*** ***(N = 62)*** | **223%** **(P = 0)** |
| ***$15 PENALTY FOR LYING*** ***(N = 68)*** | **200%** **(P = 0)** |
| ***100% VERIFICATION*** ***(N = 74)*** | **200%** **(P = 0)** |

* Bold face indicates a significant improvement over the control group.

Before concluding, we wish to note that not all scholars of deliberation have overlooked the benefits of expertise systems. Indeed, many scholars who advocate deliberation actually recommend some form of an expertise system. To take just one prominent example of this phenomenon, consider the deliberative setting that Bruce Ackerman and James Fishkin recommend:

> [D]eliberators will go to randomly assigned groups of 15 for the first event—at which they will sit together to *watch a live television debate on the leading issues between the principal national candidates. . . . The parties will also be invited to spell out their basic positions on the selected issues in a briefing document suitable for the mass public. . . .* Phase two begins at 10:30 with the small group's first order of business: *the deliberators must select a foreman, by majority vote,* before they proceed to their main task—which is to prepare their contribution for the large group meeting of 500 that will take place after lunch. During this afternoon session, *local representatives of the rival parties will appear before the group and try to answer any questions raised about their parties' television presentations. . . . Each large group will have its moderator—perhaps a local judge, perhaps a member of a civic group like the League of Women Voters.* She will soon be in proud possession of the question lists submitted by each small group foreman.[93]

As the italicized portions of the text reveal, some form of an expertise system is in place at various stages of Ackerman and Fishkin's deliberative setting. Indeed, there are many opportunities for participants in

93. *See* Ackerman & Fishkin, *supra* note 2, at 13-15.

this setting to learn from candidates and parties, from the foremen that they select to lead them, and from the moderators—all of whom presumably possess some form of expertise on the topic in question. There are, of course, many other examples of this phenomenon that we could draw upon, but our point here is merely to illustrate that at least some scholars of deliberation seem to have an expertise system in mind. That they ignore the tradeoff between participant equality and expertise is another matter.

## V. CONCLUSION

We began this Article by questioning scholars' untested assumption that unalloyed deliberation improves social welfare, and we demonstrated experimentally that, contrary to popular belief, deliberation under realistic conditions actually decreases social welfare. Indeed, even in groups as small as four individuals, deliberation under realistic conditions does not improve social welfare, and once the size of the group increases to eight individuals, we observe significant declines in social welfare. Based upon these experimental results, it appears that the deliberative policies and programs that scholars have advocated are doomed to be not only ineffective, but also detrimental.

These findings are also of consequence to those who emphasize that the process of deliberation has intrinsic value independent of increases in social welfare. The difficulty with justifying deliberation based on process alone is that when costs of listening and speaking are taken into account typically no one participates. Furthermore, arguments for the intrinsic value of deliberation assume that participation does not reduce social welfare; however, our experiments show there may actually be a reduction in social welfare as a result of deliberation. Therefore, for participation to be, on net beneficial one must believe its intrinsic value exceeds the resulting declines in social welfare. As we have shown in our experiment and contrary to all other models of deliberation, an improvement in social welfare is not guaranteed.

When can social welfare be improved? We presented results here on expertise systems, and we argued that such systems are superior to most deliberative settings because they satisfy the conditions required for trust, communication, and learning. We also drew upon other experimental evidence, which demonstrates that expertise systems can in fact increase social welfare. Indeed, the limited, and often unverifiable success, that

most deliberative simulations have achieved, derives from their alloying deliberation with an expertise or expert system.

Based upon these findings, the prospect of achieving a deliberative democracy appears to be quite difficult, if not impossible.[94] Indeed,

94. Note that because we paid subjects for participating in our experiments, our experiments were designed to overcome the opportunity costs associated with participation. However, even when compensating subjects for their time, for their energy, and for the other activities that they had to forego, we still did not often observe increases in social welfare. That said, it is possible that even with monetary compensation, subjects' opportunity costs might have outweighed the benefits that they received. A real world example of this phenomenon, of course, is the $15 per day that citizens earn for serving on juries. This amount is, needless to say, often insufficient to overcome the opportunity costs that many jurors face, and we wonder how many citizens would be willing to participate in a deliberative setting for $15 per day. We suspect that it is not many.

Although at this stage of our research the prospect of a deliberative democracy appears to be quite dim, in future replications of these experiments, we plan to vary other parameters in our theory and assess experimentally whether there exist any robust conditions under which subjects will deliberate to welfare-enhancing outcomes. We have found so far that, as we decrease the cost of receiving information to $1, subjects still tend not to receive information. Another parameter that we plan to vary is the opportunity cost associated with receiving information; that is, in future experiments, some subjects will have to pay a cost to receive information, while others will be able to receive information for free. Under such conditions, we expect that the game will still be an n-person dilemma and that subjects will not deliberate successfully.

Yet another experimental variation that we have begun to conduct is to allow subjects to exchange reasons for why answer "a" or answer "b" is the correct answer to a math problem. Although this variation does not alter the game between the senders and receivers, it is analogous to what many democratic theorists appear to have in mind when they advocate deliberation. Specifically, many scholars emphasize the importance of allowing citizens to reason with one another when considering particular policies or problems. *See, e.g.*, Bruce Ackerman, *Why Dialogue?*, 86 J. PHIL. 5 (1989); Ackerman & Fishkin, *supra* note 2; Cohen & Fung, *supra* note 50, at 24. We are currently implementing a version of such citizen reasoning in our experiments.

In our reasoning experiments, we allow subjects to send not only their recommendations for answer "a" or answer "b," but also a reason for choosing one of these two answers. So, each answer choice for each problem has a reason associated with it. For the correct answers to particular math problems, the reasons simply consist of short explanations/ proofs that show how and why a particular answer is the correct one (drawn from the SAT practice book). For the incorrect answers to the math problems, the reasons consist of similar explanations/proofs, but these explanations contain one flawed premise that leads to an incorrect conclusion. Such incorrect explanations/proofs are analogous to the illogical, unreasoned arguments that citizens may make when debating particular issues.

Our preliminary experimental results demonstrate, allowing subjects to exchange reasons in this manner still does not enable them to improve social welfare when there are costs associated with receiving information. Further, subjects are no more willing to pay to receive information when reasons are provided than they are in the experiments that we present in the tables above. These preliminary results are consistent with our expectations (indeed, the costs and expected benefits associated with sending and

because participants in our stylized experiment (where there were ample incentives and opportunities for deliberation) often did not deliberate to welfare-enhancing outcomes, it is unlikely that participants will be able to do so when placed in more complex deliberative settings and when faced with more difficult and costly decisions.

Nevertheless, in presenting our results, we have heard three general criticisms. First, some scholars claim that outside of the lab, when people are put in realistic deliberative settings, deliberation is more likely. In essence, this first criticism boils down to the comment that the communication environment that we model and then test is not rich enough. So, for example, scholars often emphasize that reasoning is a key part of persuasion,[95] notwithstanding our finding that even when we allow the subjects to send reasons, i.e., proofs, for their recommended choices, they still are not able to improve social welfare. We also hear that non-anonymous communication is more conducive to persuasion,[96] or that more complicated forms of communication will enhance the likelihood of successful deliberation. These latter two challenges, however, overlook many of the details of our experiment, where we did everything possible to encourage subjects to deliberate and reach a consensus. They also overlook the fact that in more "realistic" communicative settings, where choices are not binary, where problems do not have objectively correct answers,[97] where communication is often ambiguous, where opportunity costs are real (at least for some individuals), where interests conflict, and where inattention is the natural reaction if

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receiving information in our reasoning experiments are the same as in the experiments presented in this Article).

95. Note that this emphasis on reasoning is not consistent with the theory and experiments which model and then test the conditions for persuasion. LUPIA & MCCUBBINS, *supra* note 15, at 43-65. Lupia and McCubbins emphasize that the conditions for trust and persuasion need to exist or the reasons will be ignored as well as the signal. If the conditions for trust and persuasion are absent, then people will ignore the reasons as well as the conclusion.

96. Note that this claim does not take into account the literature in psychology cited in Lupia & McCubbins. *Id.* at 27-38.

97. Indeed, we often hear criticisms that the choices we ask the subjects to make—involving the answers to math problems—are not the same sort of topics to be decided by deliberative bodies. Our response is that, if people have trouble achieving a consensus about math problems, which have verifiably correct answers, why would we expect moral conflicts, involving issues such as race, religion, language, ethnicity, identity and so forth to allow consensus to be achieved easier. See GUTMANN & THOMPSON, *supra* note 10, at 13-51 for a prominent example of the argument that deliberation is the best way to resolve moral conflicts.

individuals cannot figure out whether others are knowledgeable and trustworthy,[98] successful deliberation can only become more difficult. To recall the song "New York, New York," if you cannot make it here, you cannot make it anywhere!

Second, we frequently hear criticisms that it is our choice environment (which creates an n-person dilemma game) that makes costly receiving unlikely and thus deliberation impossible. Scholars who advance this criticism then argue that if we were to adopt some form of a majority rule game in our experiments, then we would overcome the n-person dilemma and thus make deliberation possible. However, we emphasize that the n-person dilemma in the game is not removed as the size of the majority shrinks from 100% to 50% plus one, and we also note that the n-person dilemma nature of the game becomes insurmountable as the group size increases.[99] Furthermore, if we have to resort to majority rule rather than rule by consensus to achieve improved outcomes, then we have no reason to think that our existing political institutions are in need of the deliberative reforms that many scholars advocate.

Third, scholars often argue that our experimental results merely suggest that the notion of deliberation favored by radical democratic theorists (one which emphasizes equality over expertise, as we do in our theory and experiments) is the wrong model of deliberation and that there are alternative models of deliberation that allow people to develop reputations and gain information from experts, what we have called expertise systems.[100] We agree. Indeed, we are presently extending our model and experiments to test various forms of expertise (for example, we plan to allow subjects to send their SAT scores with their suggested answers and allow subjects to track the reputations of subjects who have sent recommendations previously, and so forth).[101] Our response is,

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98. LUPIA & MCCUBBINS, *supra* note 15, at 64.

99. Notice that in the political science literature on turnout (starting with William H. Riker & Peter C. Ordeshook, *A Theory of the Calculus of Voting*, 62 AM. POL. SCI. REV. 25 (1968)), the voters' decisions of whether or not to turnout also create an n-person dilemma game. Indeed, much of this literature argues that rational individuals should not turnout, just as we suggest that no one should choose to pay a cost to receive information.

100. Repeat play, which is necessary for the development of reputations, is a two-edged sword. It may lead to an enhancement in communication and it may not, depending, of course, on the conditions. Joel Sobel, *A Theory of Credibility*, 52 REV. ECON. STUD. 557 (1985).

101. We are not especially sanguine, however, that adversarial experts, absent the conditions for trust, will create a communication environment, through their arguments alone, that enhances the prospects that the "jurors" will actually be able to learn and develop expertise themselves. *See* Cheryl Boudreau & Mathew D. McCubbins, The

however, that these forms of deliberation will only work if the conditions for trust are established,[102] and moreover, that these expertise systems already exist and are widely relied upon throughout our society, economy, and polity.[103]

Further, what we observe in the many web-based efforts to form deliberative communities and the various efforts to organize deliberative settings is that scholars and activists often seem to want to establish expertise systems. But do we need separate deliberative communities (which, in reality, are often expertise systems) for every decision? It seems to us that establishing a council or some other deliberative body for questions that run from the mundane—should parking fees be charged at shopping malls—to the divisive—should the alternative minimum tax be reduced or replaced with a graduated tax, a flat tax, a VAT or something else—to the exotic—how we dispose of uranium hexafluoride and should we further restrict off road vehicles to protect the *Swallenia alexandrae*—is a bit impractical, if not completely unworkable. Indeed, while Fishkin may have shown that people can be brought up to speed on one topic, through days of intense training,[104] it seems doubtful that citizens can or will participate in more than one of these settings. And how does creating a new technocratic elite to answer these questions improve on the technocratic elite we already have, which has been the goal of democratic theorists? Further, even if citizens are willing to spend their free time and energy participating in such settings, will they be able to reach a consensus or will basic conflicts about who gets what from government persist? Given that politics is about the redistribution of rights, income, and wealth, it seems unlikely that conflict will dissipate in these deliberative settings.

All of this being said, we should note that this Article represents only the first step of a large research agenda devoted to exploring the conditions under which deliberation can and cannot work. To preview additional questions (and answers) that we propose in future Articles, consider the following: What is the nature of the necessary conditions for deliberation to improve social welfare? Answer: Stringent. What is

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Battle for Truth: Theory and Experiments Regarding Competition and the Adversarial System (2006) (unpublished manuscript, on file with authors).

102. *See* LUPIA & MCCUBBINS, *supra* note 15, at 68-78.

103. *See, e.g.*, Arthur Lupia & Mathew D. McCubbins, *Who Controls? Information and the Structure of Legislative Decision Making*, 19 LEGIS. STUD. Q. 361 (1994).

104. JAMES S. FISHKIN, THE VOICE OF THE PEOPLE: PUBLIC OPINION AND DEMOCRACY (1997).

the optimal group size for deliberation? Answer: Less than four. Can we ever achieve ideal deliberation, where everyone speaks and everyone listens? Answer: No. These questions and answers represent just some of the lines of inquiry that we will later pursue, but suffice it to say for now, that deliberation appears to be, not a cure all for societal ills, but rather a cause of decreased social welfare.

## VI. APPENDIX

The logic of our n-player, sender-receiver model is the same as that found in a simultaneous information elicitation multi-agent system.[105] The class of multi agent computations presented here is that of anonymous functions. An anonymous function is one where the function's value does not depend on the identity of the players but only on their choices. In other words, a permutation of players' choices will not change the value of the function. This class of functions is quite elementary and often used in models. Among the anonymous functions are majority rule, consensus, unanimity, average, variance, order statistic, percentile and more. The game we present has aspects of a public good (everyone benefits ten-fold if they reach a consensus). The literature on public goods games where there is a basic tension between players' individual efforts and the desire to supply a public good. Often, this literature demonstrates the impossibility of supplying the public good, even in situations where it is the socially optimal action. In this literature, players' main consideration is how much they can influence the result of the game, namely their pivotalness versus their expected contribution.[106]

In the context of our game, for individuals in the deliberative group to be willing to pay to receive information, they must believe that the information is going to increase their payoff. In simple decision theoretic terms we can define the conditions when a player will buy information. Let $P_r$ be a player's subjective probability that she will answer the math problem correctly. Let $P_p$ be a player's subjective probability that she is pivotal in determining the collective payoff. Let $V_1$ be the payoff for individually answering correctly and let $V_2$ be the bonus payoff for reaching a consensus answer (these values are $1 and $10 in our current experiment). Let $\gamma$ be the cost of acquiring

105. *See, e.g.*, Nabil I. Al-Najjar & Rann Smorodinsky, *Pivotal Players and the Characterization of Influence*, 92 J. ECON. THEORY 318 (2000); Rann Smorodinsky & Moshe Tennenholtz, *Sequential Information Elicitation in Multi-Agent Systems*, 70 TWENTIETH CONFERENCE ON UNCERTAINTY IN ARTIFICIAL INTELLIGENCE, 528, 528-35 (2004) [hereinafter Smorodinsky & Tennenholtz, *Sequential Information*]; *see generally* Rann Smorodinsky & Moshe Tennenholtz, *Overcoming Free Riding in Multi-Party Computations—The Anonymous Case*, 55 GAMES & ECON. BEHAV. 213 (2005) [hereinafter Smorodinsky & Tennenholtz, *Overcoming Free Riding*].

106. *See* Smorodinsky & Tennenholtz, *Sequential Information*, *supra* note 105, at 528-35. *See generally* Smorodinsky & Tennenholtz, *Overcoming Free Riding*, *supra* note 105.

information (this is $2 in our current experiment). Then, a player will acquire information (which is assumed to be truthful when provided, as all players here have common interests,[107] if and only if:

$$(1-P_r) > \gamma/(V_1+P_pV_2) \quad (1)$$

From inspection of Equation 1, it is the cost of information acquisition, relative to its expected benefit, that determines whether or not information will be acquired. The comparative statics from Equation 1 also make sense. The greater is $\gamma$, all else constant, the less likely a player will be to acquire information. Thus, when $\gamma$ =$0, as in our treatment when listening is free, players will always acquire information (unless they are certain they know the correct answer). The smaller is $P_p$, all else constant, the less likely it will be that a player will acquire information. In our experiment, if $P_p$ is less that .1, then, given our payoffs, it will never be in any player's interest to acquire information when the cost of doing so, $\gamma$, is equal to $2. Similarly, the smaller are the benefits to answering correctly, $V_1$ or $V_2$, the less likely it will be for a player to acquire information, all else constant.

For simplicity, and without loss of generality, assume that individuals believe that they will receive accurate and truthful information (if they believe otherwise, which might occur if the problem is so difficult that no one is able to answer it, then they will not purchase the information and the outcome of the game is one where the participants coordinate only by chance). If individuals buy the information and then solve the problem correctly, they can only ensure that they earn $1, which is not enough to compensate for the cost of the information, which is $2. If player j, for example, sees the math problem as being pretty difficult (so that the mean of the distributions of $P^{ia}$ and $P^{ir}$ are .5 and .6 respectively), but not extraordinarily so, then even in groups as small as five subjects, there are no beliefs about $P_r$ that support paying for information when the cost is $2. The cost would have to drop to less than fifty cents in this example before anyone would consider acquiring information (if they held the same beliefs about themselves as they do the others). In this case, the cost of information, relative to the potential benefit (the right hand side of Equation 1), would have to be more than twice what it is in our experiments (i.e., the potential benefits would have to be 22 times the cost of information). While we will experiment with these conditions in

107. Crawford & Sobel, *supra* note 72.

future research, however, most scholars have judged the costs of political participation to be roughly equal to the benefits,[108] with many viewing the costs as exceeding the benefits.[109]

In larger groups the problems are worse yet. With fifteen people, even if the mean of the distributions of $P^{ia}$, $P^{ir}$ and $P_r$ are all .99 respectively (so it is the easiest problem we could give the group to solve), then $\gamma$ <$.10 (thus the cost of acquiring information is more than two orders of magnitude smaller than the potential benefits of acquiring information), or, with $\gamma$ =$2 as in our experiments, player j must think she has less than a 77% chance of answering correctly (and thus believes that the probability that she is drawn from the same distribution as all of the other players is less than .00000001). As group size exceeds 110, $P_p$ drops so far that the value of consensus is exceeded by the individual value of answering correctly, even when the problem is, as just assumed, the easiest we could give and the cost of acquiring information would have to be less than .00001 of the potential benefit to get anyone to buy it.

As long as the cost of information exceeds its private benefit, in order to make the purchase worth the cost, it must be the case that purchasing the information increases the probability of earning the $10 bonus that comes from coordinating with everyone else. However, because each individual can only affect his or her own answer by receiving information, the purchase of information will only be worthwhile if it increases the probability of getting the collective bonus *through this one person's own actions*. Thus, individuals must believe that they are pivotal, that their actions and their actions alone determine whether or not they earn the collective bonus.[110] They must believe that everyone else either knows

108. John A. Ferejohn & Morris P. Fiorina, *The Paradox of Not Voting: A Decision Theoretic Analysis*, 68 AM. POL. SCI. REV. 525 (1974); Riker & Ordeshook, *supra* note 99.

109. *See generally* ANTHONY DOWNS, AN ECONOMIC THEORY OF DEMOCRACY (1957); GORDON TULLOCK, TOWARD A MATHEMATICS OF POLITICS (1967).

110. If we had modeled the decision rule as majority or anything less than unanimity, the basic logic of the argument about pivotalness would still apply. Individuals would have to believe that they were the pivotal person to the group achieving the $10 coordinating bonus. In any large "N" setting, even with majority rule, the probability of being pivotal is exceedingly low. If we had used a non-unanimous decision rule we may have seen some changes in behavior. For instance, it may be that more people would buy information, which is related to the higher, although still slim, odds of being the pivotal player. However, modeling deliberation as something other than consensus would not change the basic theoretical results. For an example of modeling deliberation as a majority-rule, expertise exercise, see Dickson, et. al., *supra* note 42, at 2.

the correct answer to the problem or will receive information about it. So how do individuals calculate the probability that everyone else will answer the problem correctly?

In general, the problem is that this game requires k-level thinking.[111] That is, individuals must have beliefs about everyone else in the game, they must have beliefs about everyone else's beliefs, they must have beliefs about everyone else's beliefs about everyone else's beliefs, and so on. Thinking this through may be quite expensive cognitively. This is especially true in our experiments and in ideal deliberative settings, where people do not know each other and cannot draw inferences about each other based upon how they look, act, speak, smell, dress and so on.[112] People may not bother to think through the game in order to

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111. *See, e.g.*, Colin F. Camerer, Teck-Hua Ho & Juin-Kuan Chong, *A Cognitive Hierarchy Model of Games*, 119 Q. J. ECON. 861 (2004); Miguel Costa-Gomes, Vincent P. Crawford & Bruno Broseta, *Cognition and Behavior in Normal-Form Games: An Experimental Study*, 69 ECONOMETRICA 1193 (2001); Vincent P. Crawford, *Lying for Strategic Advantage: Rational and Boundedly Rational Misrepresentation of Intentions*, 93 AM. ECON. REV. 133 (2003); Teck-Hua Ho, Colin Camerer & Keith Weigelt, *Iterated Dominance and Iterated Best Response in Experimental "p-Beauty Contests"*, 88 AM. ECON. REV. 947 (1998); Rosemarie Nagel, *Unraveling in Guessing Games: An Experimental Study*, 85 AM. ECON. REV. 1313 (1995); Dale O. Stahl & Paul W. Wilson, *Experimental Evidence on Players' Models of Other Players*, 25 J. ECON. BEHAV. & ORG. 309 (1994); Dale O. Stahl & Paul W. Wilson, *On Players' Models of Other Players: Theory and Experimental Evidence*, 10 GAMES & ECON. BEHAV. 218 (1995); Miguel Costa-Gomes & Vincent P Crawford, *Cognition and Behavior in Two-Person Guessing Games: An Experimental Study* (UCSD Discussion Paper 2004-11, 2004), *available at* http://weber.ucsd.edu/~vcrawfor/16Dec05GuessingMain.pdf; Vincent P. Crawford & Nagore Iriberri, *Fatal Attraction: Focality, Naivete, and Sophistication in Experimental "Hide-and-Seek" Games* (UCSD Discussion Paper 2004-12R, 2005), *available at* http://weber.ucsd.edu/~vcrawfor/30Jan05Hide& Seek.pdf.

112. Indeed, if such signals existed, then individuals could not be equal. If they were allowed to know certain characteristics about each other, then they may be able to simplify this cognitive problem by reducing the range of beliefs that they hold about each other. If this were the case, however, then it is not clear that each person's statements, if made, would be judged equally by all of the other participants, and it is also not clear that information and collective decisionmaking would be improved. In the game we present in our experiments, all individuals share a common incentive, and they earn money if they answer the problems correctly, and they earn much more money if they *all* answer the problems correctly. This will not be true in unstructured deliberative settings; thus, the conditions for trust among the participants may not exist and deception among the participants may arise, which will lead to a loss of trust among all participants, which in turn will lead to a collapse of deliberation. On the flip side, if trustworthy and knowledgeable individuals arise in this setting (which might occur if individuals are allowed to get to know one another), then these individuals will be listened to and others will not be, so the deliberative setting will become an expertise system.

calculate the probability that they are pivotal. And, for there to be an equilibrium where everyone who needs help pays to receive information, everyone has to believe that they are pivotal (and that others are either pivotal just like them or know the answer without help) and thus have an incentive to pay for the information, as they are more or less certain their actions will bring about the collective bonus.

However, there are only two ways that all individuals who need help can believe that they are pivotal, and neither of these sets of beliefs is supportable. First, these individuals must believe that they do not know the correct answer to the problem and that others *do* know the correct answer. They must also believe either 1) that others know the answer and know that they know it or 2) that others are just like them and believe that they do not know the correct answer and believe that others do know the answer. Thus, there are two types of individuals: first, individuals who know the correct answer without help and second, individuals who do not know the correct answer to the problem and believe that others do. This second type is the prospective receiver of communication.

Consider the following example, in which there is one speaker and two receivers: Receiver A and Receiver B. In order to believe he is pivotal, Receiver A must simultaneously believe that he does not know the answer but that Receiver B does know the answer. Concurrently, Receiver B must believe that she does not know the correct answer while thinking that Receiver A does know the correct answer. These beliefs are unsupportable, as Receiver A's assessment of himself and his assessment of Receiver B is at odds with what he believes Receiver B believes, even about himself. As such, people will not hold these beliefs, and the equilibrium where everyone who needs the information pays to receive it is unlikely.

To see the logic here, we can define the probability of pivotalness, $P_p$, to be the product of more basic probabilities, let $P_p = \Pi P^{ia} * \Pi P^{ir}$, where $P^{ia}$ is player j's subjective probability that all other players, i=1, . . .n, will answer the math problem, while $P^{ir}$, is player j's subjective probability that all other players i=1, . . . n, will answer the problem correctly, if they answer. Take for example, the case where there are ten players, that is player j and nine other players. Let the mean of the distribution of $P^{ia}$=.9, that is player j believes that on average, every other player will answer the math question 90% of the time. Let the mean of the distribution of $P^{ir}$=.9, that is player j believes that on average, every other player will answer the math question correctly 90%

of the time when they choose to answer (i.e., they judge the problem to be easy). Thus, $P_p = .15$. In our treatment, where $\gamma$=\$2, $V_1$=\$1 and $V_2$=\$10, it follows from Equation 1 that $P_r < .2$. Thus, player j must think he has less than a 20% chance of getting the answer right (even though the problem is judged by player j to be easy), while everyone else has a 90% chance of getting the answer right. If these beliefs are true, simultaneously, then player j must also believe that the probability that she was drawn from the same distribution as the other nine players is less than .00000001. For everyone to acquire information, as is desired in the literature on deliberation, then everyone must believe they are dumb (have only a 20% chance of getting the problem right) while everyone else is smart (they have a 90% chance of getting the problem right), and moreover they must believe everyone believes this about them, so that while they think they are dumb, they think everyone else thinks they are smart. This would seem to be a very odd set of beliefs to hold.

We are thus left with the second type of beliefs that could support an equilibrium in which everyone who needs information pays to receive it. In this set of beliefs, everyone believes that they are unable to answer the question without help, and they believe that everyone else is the same and that everyone else believes this about everyone else. This set of beliefs is unsupportable as well, for if it is true, then no one will step forward to send information about the correct answer to the problem, and everyone will pay to receive information that, in fact, was never sent. Thus, these beliefs also seem unsupportable, and, in equilibrium, no one should choose to pay to receive information.