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The Role of Persuasion in Deliberative Opinion Change

SEAN J. WESTWOOD

How does discussion lead to opinion change during deliberation? I formulate and test hypotheses based on theories of persuasion, and examine them against other possible sources of deliberative opinion change. Through detailed analysis of a nationally representative deliberative event I create a full discussion network for each small group that deliberated by recording who said what, the argument quality for what was said, and to whom it was directed. I find that well-justified arguments made in the context of direct engagement between peers are a consistent predictor of opinion change. Individual-level persuasion, not knowledge-driven refinement or extremity, drives most opinion change. These results show that further deliberative research needs to account for persuasion when explaining deliberative opinion change.

Keywords persuasion, deliberation

Evidence documenting opinion change after deliberative discussion is strong and consistent, but the causes of opinion change are less clear. There is a significant but shrinking divide between the theory used to support (and oppose) deliberative models of consultation and what we actually know about how the processes of deliberation function. In response to limits to the testability of broad theoretical models of deliberation, some argue for less idealistic and more testable “middle-range” theories and models of deliberation (see Mutz, 2008). In this paper, following Mutz’s (2008) suggestion for research engaging smaller components of larger deliberative models. I specifically focus on the role of *persuasion* on opinion change.

Although persuasion is an important part of the process of opinion change, it is underexplored in the current literature. Despite classic psychology and communication research showing the importance of the amount and kind of persuasive discussion on opinion formation (see Hinsz & Davis, 1984; Poole, McPhee, & Seibold, 1982), a large amount of work on deliberative opinion change does not explore the effects of discussion as a persuasive tool (however, for work on the composition of group discussion on outcomes see Gastil, Black, & Moscovitz, 2008; Karpowitz, Mendelberg, & Shaker, 2012; Luc, 2013; Mendelberg, Karpowitz, & Goedert, 2013). There is good reason to believe that people

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change their opinions not just because of the sum total or variety of the presented arguments, but because of the persuasiveness of the arguments and those making them (see Hinsz & Davis, 1984; Sanders, 1997).

Discussion is core to deliberation, but there are many theoretical models of deliberation with varying requirements, expectations, and assumptions. Theories of deliberation generally suggest that opinions change as a result of discussion and consideration of opinions expressed during discussion (Fishkin, 1997; Gutmann & Thompson, 2004; Habermas, 1984; Neblo, 2005). Some models theorize that deliberative opinion change is the result of the evaluation of a multitude of different arguments, which ultimately increases knowledge and thus creates refined opinions (Elster, 1998; Fishkin, 2009; Gutmann & Thompson, 2004), while similar work argues that increases in awareness of differing views creates opinion change (see, for example, Kim, & Wyatt, Katz, 1999; Price, Cappella, & Nir, 2002). Another body of theory, drawing largely from psychology, is more critical of discussion, and contends that opinion change is the result of movement to more extreme positions after deliberation (Schkade, Sunstein, & Hastie, 2007; Turner, Hogg, Oakes, Reicher, & Wetherell, 1987), and possibly cognitive biases (Sanders, 1997). In all of these models, engagement among participants is crucial. Yet, a segment of this literature assumes—somewhat problematically—that participants not only consider opinions from other deliberators, but that “the decision-making process must involve discussion of all the viewpoints, with none of them excluded *a priori*” (Pellizzoni, 2001, p. 60). Because consideration of arguments is often constrained by the traits and abilities of participants, deliberation has uneven effects on participant opinions. Differing power dynamics elevate and suppress arguments from some participants (Pellizzoni, 2001; Sanders, 1997) and some participants in deliberative discussion are simply unable or unwilling to engage in the amount of cognitive work required to fully evaluate all the information presented during discussion (Mendelberg, 2002). One reason for individual differences in opinion change, explored here, is the persuasiveness of arguments made during debate that specifically engages individual participants.

This article addresses important standing gaps in the deliberative literature: Understanding how persuasive interaction affects opinion change and how important persuasion is relative to other sources of opinion change. First, through a novel combination of large-scale content analysis and social network analysis, I convert complete transcripts from an online deliberative experiment to a discussion network. As part of the content analysis, argument quality was assessed using the justification subscale of the Discourse Quality Index (Steenbergen, Bachtiger, Spordli, & Steiner, 2003). Together the network data and content analysis facilitates a general assessment of the argument quality for each statement made during deliberation and a complete map of who talked, what they said, and with whom they debated the issues. The deliberative event occurred over a series of meetings dedicated to specific issues and included a robust set of knowledge and opinion measures. I scale the effect of persuasion on individual opinion change against two theorized sources of opinion change across a number of issues: knowledge gain and the effects of polarization. Results show that persuasive argumentation is both the largest and most consistent indicator of opinion change. Although a Deliberative Poll is the source of data for this manuscript, my findings apply to the richer and more expansive body of deliberation research created concurrent to the Deliberative Polling model. Indeed, deliberative designs where interaction occurs over a longer period of time and where more individuals are able to share a larger number opinions are likely to produce more justified persuasive arguments.

Studying Deliberative Discussion

The first empirical work studying the process of deliberation was quite basic and focused largely on “simple input-output models of deliberation effects and [did not test], for example, whether the content and structure of actual citizen discussions follows normative assumptions . . .” (Price, Nir, & Cappella, 2005, p. 5). By relying solely on differences in survey responses collected pre- and post-deliberation (e.g., Luskin & Fishkin, 2002; Sunstein, 2009), this work infers the success or failure of group discussion without directly assessing the actual content of discussion, and therefore does not determine the causal effect of discussion on opinion change.

Recent research, however, employs more sophisticated methods to test theoretical assumptions on the effects of discussion during deliberation by exploring the actual content of discussion. For example, analysis of deliberative discussion shows that exposure to differing viewpoints increases understanding of the perspectives of others (Price et al., 2002). The composition of deliberative groups and the topics they discuss significantly changes what is said during deliberation (Karpowitz et al., 2012; Mendelberg et al., 2013; Price et al., 2005). Moreover, responsiveness to deliberative discussion and the kinds of arguments shared during discussion is contingent on the framing of the issue under discussion (Druckman, 2004; Price et al., 2005), and the salience of the issue to the individuals deliberating (Barabas, 2004). The presence and quantity of substantive debate and disagreement also significantly improves perception of deliberative satisfaction (Stromer-Galley & Muhlberger, 2009), showing that the content of deliberation is not merely a mechanism driving opinion change but something that is both appraised and valued by participants. The evidence shows that differences in the content of discussion result in different deliberative outcomes, and that the deliberative environment itself alters the content of discussion.

Persuasion and Opinion Change

Decades of data from social psychology research on group dynamics suggest that persuasion drives—or at least contributes to—opinion change during group discussion. Persuasion, simply conceptualized, is a process of attempts to change attitudes. Here I consider both the process of persuasion and what kinds of arguments are made during persuasive interactions during deliberation. Again, this work is not intended to evaluate the success or the validity of larger models of deliberation, but simply to document the effects of persuasion on opinion change during deliberative discussion.

The study of social influence and persuasion, especially in the context of decision-making bodies, traces back to the founding of social psychology as a discipline (Allport, 1935; Kelman, 1961). The foundational work on persuasion demonstrates that the reception of persuasive messages is conditional on the source of a message, the content of a message and the audience receiving the message (Festinger, 1964; Howland, Kelley, & Janis, 1954; McGuire, 1968). Known as systematic models of persuasion, these models require a great deal of cognitive effort. In rigid conceptualizations, the systematic model assumes that receivers pay attention to messages, evaluate the logical structure of arguments, and assess both their own status and the status of the persuader before forming or changing opinions. When people expend the cognitive effort to evaluate and consider message content, data show that persuasive argumentation causes opinion change (e.g., Chaiken & Eagly, 1976).

However, people often do not carefully consider the information they receive and instead superficially process information using heuristics (Chaiken, 1980; Chaiken & Trope, 1999). When processing heuristically, the content or logic of a message is not as

carefully considered; instead past experiences and more superficial aspects of a message can cause (or prevent) opinion change. For example, when processing heuristically a person may accept an argument because it came from an expert due to a general expectation that experts are trustworthy (Chaiken, 1980). Superficial attributes of messages, such as the order in which statements are presented (Haugtvedt & Wegener, 1994), the simple expression of a new concept (Miller, 1976; Zajonc, 1968), and the assertion of superior external support (Petty & Cacioppo, 1981) significantly affect opinion change. Systematic models of persuasion are very compatible with many deliberative theories as they focus on careful evaluation of messages, while models of heuristic processing are possibly less compatible as they show that traits external to actual arguments can explain opinion change. In either the systematic or heuristic model, argument quality can change opinion (argument development can function as a cue in heuristic processing). This article does not address which model is best. Instead, I characterize deliberative interactions based on how they may or may not trigger systematic evaluation.

When dealing with information individuals prioritize cognitive processing based on issue salience and cognitive ability (Chaiken, 1980; Petty & Cacioppo, 1986). Some deliberative statements garner the full cognition required in the systematic (central) processing pathway, but some go through the peripheral pathway where full consideration is replaced by heuristic judgments. The process of discussion—distinct from the content of discussion—changes cognitive evaluation and prioritization. Direct discussion between individuals increases the perception of salience and the likelihood that messages exchanged between the individuals are processed systematically and not heuristically. When attempting to engage or persuade, the use of triggers such as “you” or the remembrance and use of a person’s name consistently increase persuasive effectiveness and compliance with requests and messages (Howard, Gengler, & Jain, 1995; Shavitt & Brock, 1986). The identification of a specific individual by a speaker also increases personal relevance and investment in a message. Interactions directed at a specific person within a group are therefore functionally different from group statements, and are consequently processed differently by receivers because of more sophisticated cognitive processing (e.g., Petty & Cacioppo, 1984). For persuasion to have maximal impact on attitudes, it should ideally be well justified by the sender and systematically processed by the receiver. An efficient way to trigger systematic processing is to increase perceived salience of a message by a receiver, which, according to prior research, dyadic interaction (debate between individuals) should accomplish. Institutional designs can incentivize cognitive elaboration and systematic processing, and set norms that such consideration is expected, but even with these expectations the nature of human cognition persists and the traits of individuals and arguments should persist.

Scaling the Effect of Persuasion Against Other Sources of Opinion Change

A key purpose of this article is to compare the effects of persuasion to other suspected sources of opinion change. I scale the effects of persuasion against the effects of learning about issues and the effects of extremity from group attitudes. By exploring these different mechanisms I can determine the magnitude of persuasive effects against other possible sources of opinion change.

Opinion Shift from Knowledge Gains

Substantial normative heft supports the proposition that knowledge gains drive opinion change. After all, political knowledge is key to policy opinions (e.g., Gilens, 2001), and

knowledge consistently moderates many political attitudes and behaviors (Bartels, 1996; Delli Carpini & Keeter, 1996; Zaller, 1992). While the link between knowledge gains and deliberative opinion change is frequently cited (see Eveland, 2004; Luskin & Fishkin, 2002), it is often not explained as an individual-level process (for an exception, see Gastil and Dillard, 1999) but rather as aggregate group changes. Strikingly, in some—though not all—deliberative events, knowledge actually *decreases over time* (Denver, Hands, & Jones, 1995). Following the American National Election Studies and other standard instruments, deliberative studies often operationalize knowledge as a series of questions that participants answer before and after deliberation, or in some designs only at the end of deliberation. After deliberation, significantly more participants correctly answer some (but not all) factual questions, such as the number of parks in a city (Fishkin, He, Luskin, & Sin, 2010), the party in control of the state legislature (Fishkin, 2011), or general civics questions (Price et al., 2002). Many assert that these two measures are not simply correlated, but that knowledge directly drives opinion change. This is problematic as (a) a large subset—sometimes a majority—of participants do not gain knowledge during deliberation, and (b) there is little evidence to suggest that knowing answers to factual civics questions is sufficient to drive changes in opinion, especially considering that when national, salient issue-knowledge questions are asked, “gains in issue-knowledge are modest at best” (Price, 2009, p. 15).

Evidence showing that changes in knowledge cause changes in opinion during deliberation is mostly derived from correlations between pre- and post-deliberation knowledge (for some evidence, see Eveland, 2004; Luskin & Fishkin, 2002). While models showing the correlation between knowledge and opinion change are often significant, these results do not explain how deliberation creates the observed effects. Nonetheless, opinion changes from knowledge gains are, based on attention in the literature, worthy of comparison to persuasion.

Opinion Shift and Polarization

Polarization in the context, of deliberation largely focuses on group movements and not individual opinion change (Bray & Noble, 1978; Fishkin et al., 2010; Schkade et al., 2007; Sunstein, 2009). Critics of deliberation contend that discussion with dissimilar peers creates opinion change by driving participants to hold more extreme positions after deliberation relative to their original opinion or relative to the original position of the group. It is argued that polarization—defined both as a movement toward more extreme positions on issue scales and movement toward a more extreme overall group opinion—causes opinion change because of group effects on individual attitudes.

There is evidence to support these theories of opinion change. People adopt more extreme (not necessarily more risky or group-consistent) positions after group discussion across a wide variety of attitudinal measures (Moscovici & Zavallón, 1969). However, outside of deliberation (both judicial and political) those investigating the psychological processes of interaction have largely abandoned research on risky shifts—the tendency to adopt riskier positions after group engagement—within groups in favor of research on how groups and group processes—like persuasion—influence individuals (Reis, 2010). As Chambers (2003, p. 319) notes, “[t]he significance and limitation of the group polarization research comes to light if we read it alongside other experimental data.” Rather than focusing on group opinion, I directly assess the effect of deliberation on movement toward more extreme attitudes and toward the initial attitudes of the group. I compare these effects to persuasion and knowledge changes.

Defining the meaning of polarization in deliberation is outside the scope of this article, but to offer a fair assessment of discussion and polarization I will look for effects consistent with both conceptions of polarization—movement toward the polar extremes on issue questions and movement toward the pre-deliberation group opinion.

Hypotheses

I offer and test specific hypotheses explaining opinion change during deliberation. The hypotheses are not mutually exclusive—all are supported by theory and could reasonably account for opinion change.

First, given the importance of persuasion on opinion change in other discussion environments, and that well-argued and salient persuasive messages are more likely to have strong effects, I hypothesize (H1) *that persuasive interaction causes opinion change in the direction of the position of the persuader*. The literature on the cognitive response to persuasive messages shows that justified and salient messages are likely to cause opinion change. To test this hypothesis I code each message exchanged during a deliberative event for argument quality and identify the intended target (receiver) of the message. The hypothesis would be supported if justified messages with high salience (messages intended for specific individuals) cause opinions to change. Furthermore, I expect that opinion change caused by persuasion will result in opinion change in the direction of the ideological content of the message (i.e., more conservative messages cause more conservative opinions).

Second, acquiring knowledge should cause opinion change. Therefore, I hypothesize (H2) *that increases in knowledge cause opinion change*. People who learn during discussion should provide changed opinions at the end of discussion. To test this hypotheses I compare opinion change for those who learned and those who did not learn.

Third, I hypothesize (H3) *that people are not merely adopting more extreme positions as a result of deliberation*. If people are responsive to persuasion, then movements should not be caused by either group or individual attitudinal extremity. To test this expectation I look at how individuals' attitudes shift toward and away from the extremes (both scale end points and pre-deliberation group mean attitudes) after discussion.

Finally, I hypothesize (H4) *that individuals are not merely moving toward the initial attitude of their discussion group*. To test this expectation I look at the effects of initial group attitudes on opinion change across a series of issues.

I test these hypotheses together and individually in the following analyses.

Data and Measures

Data come from the "2004 Online Deliberative Poll on the Primaries." A group of 284 deliberators gathered from the Knowledge Networks panel participated in five one-hour discussions of issues related to major U.S. political issues in January 2004. A control group of 460 individuals that did not deliberate and only completed pre- and post- interviews was also drawn from the Knowledge Networks panel. Participants without Internet access were given a computer equipped with Internet access, participants who already had a computer and Internet access were offered an honorarium of \$200, and members of the control group were offered an honorarium of \$40.

Participants were randomly assigned to one of 16 small groups for discussion. Each group met online using voice-chat software that allowed participants to hear but not see one another. The use of an online sample is particularly advantageous to this study to control for possible effects of status, as it was not possible to detect the composition of the group

without keeping notes on the gender and age of each participant as they talked (if these traits could be discerned by voice alone). This is especially important given that group demographic composition has strong effects on engagement and opinion change (e.g., see Karpowitz et al., 2012; Mendelberg, 2002; Mendelberg et al., 2013). While not intended as part of the original design, the use of an online voice-chat system likely mitigates the importance of traits indicating status. It is also possible that cues present in face-to-face deliberation (race, age, and gender) are discernible from voices, but the elimination of visual interactions reduces the observability of these traits.

A moderator was present in each group to ensure decorum, to provide technical assistance, and to convene each discussion session. Participants were free to talk to the entire group, ask questions of one another, and to engage in debate among one another. Transcripts for one small group were missing and were excluded from analysis. The final number of participants included in this analysis was 264. The average small group size was 15.53 ($SD = 2.95$).

Content Analysis

Statements from each of the 15 small groups (75 hours of total deliberation) were algorithmically coded for direct references to other participants and converted into directed edgelist format (a form of data where every interaction is listed as a single row with information on the message sender and message receiver as columns).¹ A group of 14 human coders (a subset of three for each statement) then verified the computer assessment of all statements in the sample. The humans also coded each statement for argument quality as explained later. Wherever disagreement occurred, the majority opinion was used.

The quality of arguments presented in deliberation was determined with the justification scale from the Discourse Quality Index (DQI) developed by Steenbergen and colleagues (2003). The full DQI is comprised of several measures of discourse and is designed to assess parliamentary debate. Here I focus only on the justification component as this is the interest of the article and because this measure is not specific to parliamentary discussion. Statements were coded into four categories: (0) No justification, (1) Inferior justification, (2) Qualified justification, and (3) Sophisticated justification. Overall intercoder reliability was high (Krippendorff's $\alpha = .83$).²

Peer Interactions As Social Network Data

The deliberative environment allowed all participants to see the names of other participants and to request the microphone at any time. Participants were free to direct comments to the group, to single individuals or to many individuals. All participants were present for all statements, but there are several important differences between statements directed to the group and statements directed to another participant. Messages to the group were usually general, while messages directed to another participant were explicitly identified as for another participant (references by name) or implicitly identified as for another participant (references to the "last speaker," "the person before me," etc.).

While deliberating, participants offered 4,096 statements, of which 2,332 were directly related to topics of deliberation. Statements to and from moderators, greetings, technical support questions, and inaudible comments were removed from the data. Each statement was, as part of the coding process, classified as a statement to the group as a whole or as a statement directed at a specific participant. For example, in discussion when "participant x" referred to a point made by "participant y," this statement was recorded as a statement

directed at “participant y” from “participant x.” These interactions occurred in front of the group, but were dyadic in nature and constitute most of the substantive debate and discussion in the deliberative groups. The coding was initially completed with custom software that identified references to other participants. Human coders used a second custom software tool to process all interactions and to verify results identified by the software. Data on interactions between individuals identified from the content analysis of the group transcripts were structured as network data. This process allows for comprehensive mapping of all interactions between participants and for all participants.

With the data from the content analysis it is possible to assess both the number of directed statements directed toward each participant, and the level of sophistication of each statement. For each of the main deliberative issues the number of interactions for each participant from more conservative peers and more liberal peers was recorded. Peer interactions were limited to instances of substantive and justified arguments.

Survey Data

The overall political knowledge measure included seven factual knowledge questions and 24 candidate issue-placement questions (identifying whether candidates support or oppose policy issues). The overall measure was a percentage of correct responses to the 31 questions.³ Average inter-item correlation was .3. Discussion within the Deliberative Poll focused on major issues salient to the national political landscape in January 2004, with attitudes measured pre- and post-deliberation. All questions were captured with 5-point Likert-like scales and were coded with a neutral midpoint. Seven specific areas of policy preference and two economic outlook questions were captured in the poll questionnaires and are reported in [Table 1](#). Opinion change was calculated by subtracting attitudes reported at the start of deliberation (T1) from attitudes reported after deliberation (T2). Information on those at the midpoint at both T1 and T2 is reported in the appendix in the Supplemental Material.

In the following analysis these questions are scaled such that higher scores reflect the liberal position and lower scores reflect the conservative position. Liberal and conservative positions were determined by the average response by Democrats and Republicans in the sample, which in all cases were on opposing sides of the scale midpoints. Average opinion change was not consistent between issues either in direction or significance, which itself is an important finding. One possible explanation for this discrepancy is framing effects (see [Price et al., 2005](#))

A measure of extremity from the group at T1 was also generated. The measure follows the design of [Fishkin and colleagues \(2010\)](#) and [Sunstein \(2009\)](#) and was constructed by taking the absolute value of the difference between each respondent’s T1 attitude and the median T1 attitudes of the respondent’s discussion group (excluding the respondent). This measure indicates how far from the group median each respondent was at the start of deliberation.

Results

I present my findings in three parts. I first show that dyadic debate is highly justified. Next, I show that dyadic interaction has strong effects on opinion change. Finally, I compare the effects of persuasion to the effects of other theorized mechanisms of deliberation opinion change.

Table 1
Issue descriptive statistics

Issue	T1 mean (SE)	T2 mean (SE)	Δ Opinion (T2-T1) (SE)
Iraq By the time we leave Iraq, the results will have been worth the cost in lives and dollars.	3.13 (0.09)	3.31 (0.09)	0.18** (0.07)
Multilateralism The U.S. should share its control of Iraq with other countries or the U.N. in return for their sharing more of the military and financial burden.	2.01 (0.08)	1.97 (0.07)	-0.04 (0.06)
Preemptive war In general, the U.S. should be willing to invade other countries we believe pose a serious and immediate threat, even if we don't have a lot of international support.	3.25 (0.09)	3.13 (0.09)	-0.12 (0.08)
NAFTA What sort of impact would you say that NAFTA has had so far on the American economy?	3.47 (0.08)	3.65 (0.08)	0.19** (0.07)
Subsidies The U.S. should reduce government subsidies pro-tecting U.S. farms and industries from competition.	3.04 (0.09)	2.99 (0.08)	-0.05 (0.08)
Free trade On the whole, more free trade means more jobs, because we can sell more goods abroad.	2.94 (0.08)	3.24 (0.08)	0.30*** (0.08)
Protectionism Protecting existing American jobs and industries is more important than lowering prices and creating new jobs through free trade.	2.62 (0.08)	2.46 (0.08)	-0.16* (0.08)
Past econ Thinking back over the past few months, would you say the national economy is:	2.72 (0.07)	3.00 (0.08)	0.29*** (0.06)
Future econ Now looking forward to the next few months, do you expect the national economy to get better or worse?	2.5 (0.06)	2.64 (0.07)	0.15* (0.06)

Note. Two-tailed, paired t-tests. All scales are 5-point Likert-like scales.

*** $p < .001$. ** $p < .01$. * $p < .05$.

How Persuasive Is Dyadic Debate?

Results from the justification subscale from the DQI clearly show that statements directed at a specific peer are far more justified than statements made to the group at large. Table 2 shows that-discourse quality for both directed statements and group statements is generally high. In general, statements directed at a specific peer in addition to offering some justification offered more sophisticated use of justifications to support arguments. Nearly 90% of statements directed at a specific peer offered some justification and slightly less than 75%

Table 2
Discourse quality and interaction between participants

	Statements to an individual	Statements to the group
No justification	87 (10.60%)	475 (31.44%)
Inferior justification	122 (14.86%)	416 (27.53%)
Qualified justification	537 (65.40%)	601 (39.77%)
Sophisticated justification	75 (9.14%)	19 (1.26%)
<i>N</i>	821	1511
Mean (s.e.)	1.73 (0.02)	1.11 (0.02)

Note. Data sum to 100% by column.

offered qualified or sophisticated justification. For statements to the group, slightly less than 69% were justified and slightly less than 41% offered qualified or sophisticated justification. These differences suggest that most discussion is justified in some way, though targeted discussion is considerably more justified than general interactions.

Persuasive Interaction Predicts Opinion Change

Justified persuasive statements exert strong effects on opinion change. Table 3 shows the estimated effects of interaction from peers controlling for issue-specific knowledge, extremity from initial group attitudes, and other covariates. I use multilevel models with random intercepts for small groups to account for the group structure in the data. In these models the dependent measure is the difference between opinion measured at T2 and T1. A negative value indicates movement toward a more conservative opinion, while a positive value indicates movement toward a more liberal position. The two discussion variables—“Issue-Specific Interactions From More Liberal Peers” and “Issue-Specific Interactions From More Conservative Peers”—are counts for the number of justified interactions each participant received from a member of their small group who was more liberal or more conservative on the specific policy measure.^{4,5} “Distance From Median Group Attitude” is a measure of the distance between the initial position of the participant and the median position of her small group excluding her opinion. This measure is derived from the work of Fishkin (2009) and Sunstein (2009) and is included for two reasons. First, the majority of analysis of opinion change in the Deliberative Polling universe includes the measure. Second, this measure facilitates a test of the “group movement” interpretation of polarization.

Across four discussion issues where issue-specific knowledge measures and issue-specific discussion data were available, persuasive statements from more liberal peers lead to more liberal attitudes post-deliberation. In all cases, the effect of arguments from more liberal individuals significantly changed participant opinion ($p < .05$). The arguments made by more conservative peers led to significantly more conservative opinions on three of the four issues (no significant change was detected on the issue of protectionism). For two of the issues those more distant from the median initial attitude of the group adopted significantly more conservative opinions after deliberation (free trade and protectionism), though this effect was not detected for the other two issues (Iraq and subsidies). The effect of initial distance from the group mean attitudes is therefore mixed.

Table 3Effects of peer interaction, distance from initial group attitudes, and knowledge change on individual opinion change ($t_2 - t_1$)

	Iraq	Subsidies	Free trade	Protectionism
(Intercept)	0.31 (0.40)	0.18 (0.43)	0.84* (0.44)	0.50 (0.36)
Liberal interactions	0.22* (0.08)	0.34* (0.13)	0.21* (0.07)	0.32* (0.06)
Conservative interactions	-0.07* (0.03)	-0.06* (0.02)	-0.10* (0.03)	-0.02 (0.10)
Dist. group attitude	-0.04 (0.07)	0.01 (0.12)	-0.30* (0.10)	-0.37* (0.08)
Lib. interactions × know	-0.14 (0.60)	0.09 (0.10)	-0.06 (0.11)	0.00 (0.08)
Con. interactions × know	-0.15 (0.18)	0.05 (0.09)	0.05 (0.10)	0.07 (0.11)
Issue know change	0.20 (0.23)	-0.02 (0.18)	-0.06 (0.19)	-0.01 (0.15)
Republican	-0.20 (0.16)	-0.06 (0.19)	-0.12 (0.19)	-0.19 (0.15)
Democrat	0.17 (0.17)	0.16 (0.19)	0.00 (0.19)	-0.47* (0.16)
Female	-0.27* (0.13)	-0.05 (0.15)	-0.20 (0.16)	-0.02 (0.13)
High school	0.03 (0.22)	-0.08 (0.25)	-0.10 (0.26)	0.09 (0.20)
Some college	-0.11 (0.22)	0.01 (0.25)	-0.24 (0.25)	0.29 (0.20)
College degree	-0.29 (0.22)	-0.23 (0.25)	0.32 (0.26)	0.04 (0.20)
Age	0.01 (0.00)	0.00 (0.00)	-0.01 (0.00)	0.00 (0.00)
White	-0.02 (0.20)	0.05 (0.22)	-0.17 (0.23)	-0.01 (0.18)
Num. participants	264	264	264	264
Num. groups	15	15	15	15

Note. Results from multi-level models with discussion groups as random intercepts. “Don’t know” responses to attitude questions were recoded to the value of the scale midpoint. “Don’t know” responses were scored as incorrect in the knowledge indices.

* $p < .05$

Moreover, the effects of persuasive interaction were not related to knowledge. This suggests that persuasive messages were no more effective for those who learned, those who entered as experts, or those who failed to learn. Persuasive and justified messages drive opinion change regardless of differences in issue knowledge. There were also no significant main effects of knowledge on opinion change, nor was the sign of the effect of knowledge

consistent between the models in Table 3. This is also important because knowledge is often used as a proxy for issue salience in deliberation (see Barabas, 2004), which suggests that responses to justified directed arguments have a persuasive effect regardless of salience.

After deliberation, Democrats were more likely to adopt a more liberal position on the issue of protectionism ($b = -.47$, $s.e. = .16$, $p < 0.05$), but this was not observed in any of the other issues.

Interaction from more conservative or more liberal participants predicts consistent movement in the direction of the attitude of the persuader. The effects of persuasive argumentation were both more consistent than knowledge and distance from initial group attitudes. The effect sizes of interactions from more liberal peers were consistently larger than the effect of any other measure, while the effect size of interactions from more conservative peers were smaller than the effects of both initial group attitudes and the effects of interactions from more liberal peers. Although the sample used in this study was recruited to match demographic variables, there were 7% more Democrats than Republicans and the number of Independents adopting liberal positions was twice as large as the number adopting conservative opinions. It is therefore not surprising that the effects of liberal interactions are more successful than conservative interactions—there are more liberals to respond to liberal discussion. Persuasion is clearly an important source of opinion change in deliberation.

Knowledge Change Is Not Predictive of Opinion Change

Compared to the effect of persuasive interaction, knowledge change doesn't exert much influence on opinion change. I probe this finding more closely by looking at how changes in knowledge relate to changes in opinion. The results show that persuasion is not simply absorbing the effect of knowledge change, but that knowledge change is weakly related to opinion change. Regressions with knowledge change (T2 knowledge – T1 knowledge) as the independent measure and the absolute value of opinion change as the dependent measure showed an insignificant effect of knowledge change in all but one model, where increases in knowledge had a negative effect on opinion change ($b = -.68$, $s.e. = 0.07$, $p = .03$). Figure 1 illustrates these findings in plots of the absolute amount of opinion change by knowledge change (OLS estimates, standard errors, and p -values are also reported).

Knowledge indices are often used as a proxy for learning, though it is possible that the creation of an index might introduce some noise or error that would suppress the relationship between issue-specific knowledge and issue-specific opinion change. To address these concerns Figure 2 shows the effect of issue-specific knowledge change on opinion change for the same specific issue. There is no significant relationship between knowledge change and opinion change. In fact, there is not even a clear pattern of opinion change for those who did not learn, those who were initially correct and maintained a correct answer, those who learned, and those who moved from a correct response to an incorrect response.

It is important to consider why the knowledge results in this data set differ from the reports on the results from other Deliberative Polls. Most Deliberative Polls focus on obscure policy questions (e.g., matters of UK parliamentary procedure, capital infrastructure expenses in China, or retirement policies for public-sector employees in Brazil) and associated knowledge measures. In these polls participants enter with little to no knowledge of the topic, and thus gain information and form opinions as a part of discussion. The participants in the poll analyzed here were asked to engage the most substantive policy issues of 2004 and were presented knowledge questions that were relevant to these well-known and highly partisan issues. The data used here therefore offer a more rigorous test

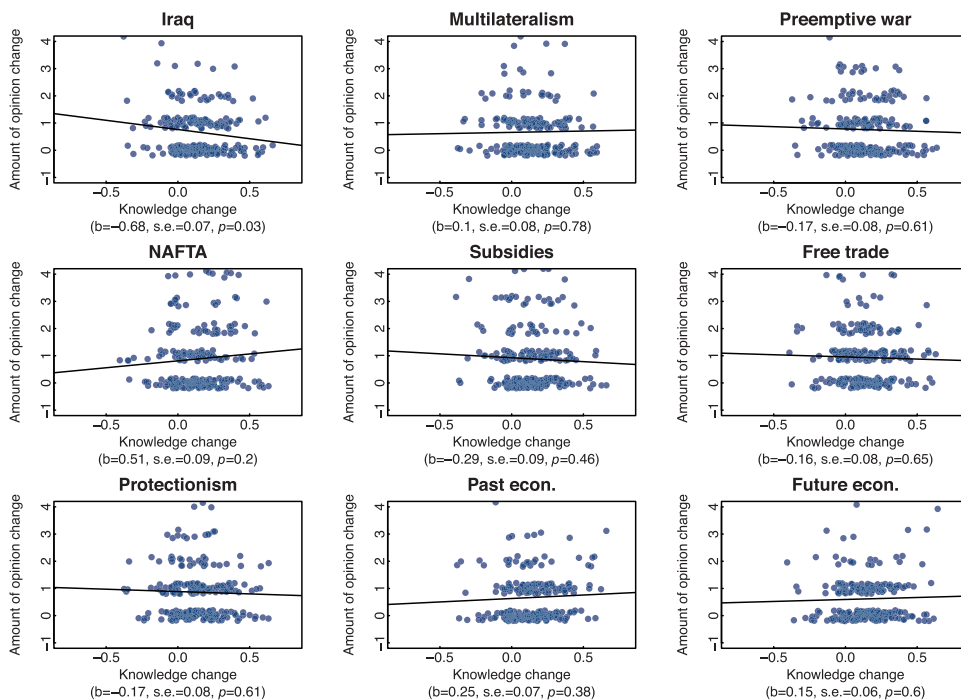


Figure 1. Absolute difference of opinion change by knowledge change.

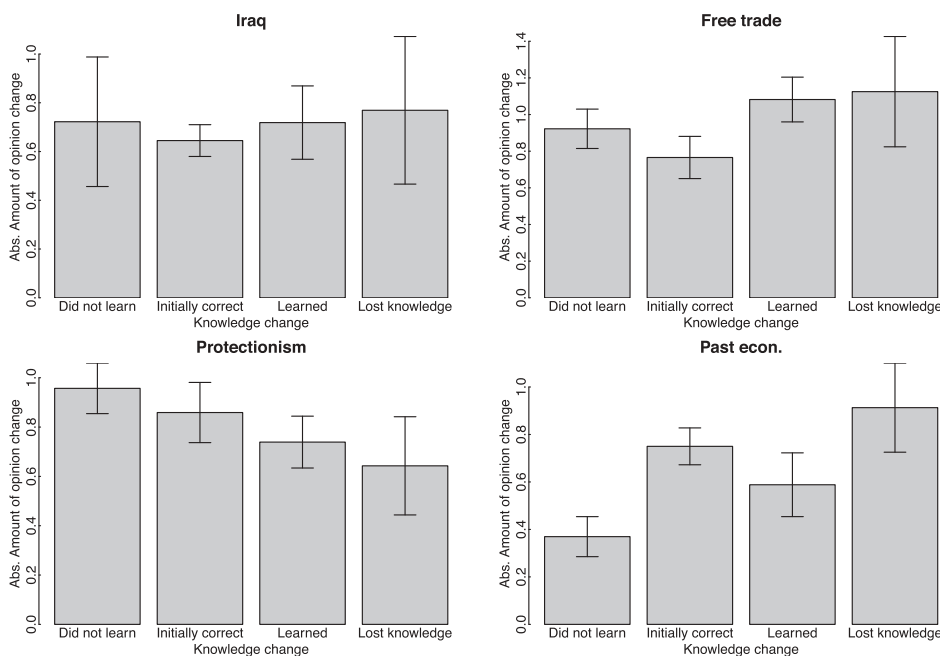


Figure 2. Issue-specific opinion change and issue-specific knowledge change.

Note: The four categories presented on the x-axis are defined as follows: “Did not learn”: Lack of knowledge both pre-and post-treatment. “Initially correct”: Knowledge on the pre-test and retention post-treatment. “Learned”: No knowledge prior to treatment, but knowledge post-treatment. “Lost knowledge”: Knowledge on the pre-test, but less knowledge post-treatment.

than previous work of what drives deliberative opinion change. Unlike polls on the minutia of infrastructure projects or energy policy, this poll tested the role of discussion on important issues for which many had strongly held views. These results are also consistent with prior work that documents knowledge atrophy in Deliberative Polls (Denver et al., 1995).

Movement Toward Extremity Is Inconsistent

Benchmarked against the effect of persuasive interactions between peers, evidence for movement toward more extreme opinions after deliberation is as equivocal as the evidence supporting learning-based opinion change. Table 3 shows the mixed results of mean group T1 opinions on opinion change (one of two conceptualizations of polarization). In this section I look at the other definition of polarization—movement to a scale endpoint after deliberation. I show that participants did not merely adopt more extreme attitudes after deliberation. On the issues covered in this deliberative event approximately 25% of respondents moved to a more extreme position at the conclusion of deliberation (Table 4). This is a sizable portion of the sample, but importantly those who move to extremes on each issue are different subsets of the sample. There is no uniform movement toward a more extreme or less extreme opinion on any of the issues. Furthermore, the majority of those with stable opinions across the two time points did not hold extreme positions that limit possible movement and instead maintain opinions between the scale endpoints. The fourth column in Table 4 shows the percentage of individuals who maintain a position at the extreme of the attitude scales at T-2. The fifth column of Table 4 shows the percentage of individuals who maintain a stable opinion at other points on the attitude scales.

Moreover, those who did adopt more extreme positions did not do so consistently across issues. On average, participants showed no change between T1 and T2 for 4.43 issues (s.e. = .11), movement toward a more extreme opinion on 2.40 issues (s.e. = 0.11), and movement toward the midpoint on 2.17 issues (s.e. = 0.09). Some opinions changed, but uniform movement to a more extreme position was not observed across issues at the level of the individual. Movement toward extreme opinions occurs, but this behavior is inconsistent.

Table 4
Participant movement toward extremity by topic

Issue	Participants at T2			
	% More extreme	% Less extreme	% No change (at scale endpoint)	% No change (not at scale endpoint)
Iraq	23%	23%	26%	28%
Multilateralism	24%	18%	32%	26%
Preemptive war	21%	27%	24%	28%
NAFTA	22%	19%	13%	46%
Subsidies	26%	22%	11%	41%
Free trade	24%	34%	9%	33%
Protectionism	27%	27%	16%	30%
Past econ.	21%	25%	12%	42%
Future econ.	18%	29%	8%	45%

Discussion

Debate and discussion during deliberation causes opinion change. Persuasion has strong and consistent effects on opinion change after deliberation, and the effects of persuasion are larger and more consequential than both knowledge change and polarization. Justified statements directed at a particular listener drive opinion change toward the attitude of the speaker. Although I am unable to test the specific cognitive mechanism responsible for participant responsiveness to persuasion—an important question for future research—prior work suggests that the kinds of interactions observed in this study are likely to trigger systematic processing (Howard et al., 1995; Shavitt & Brock, 1986). Hearing well-justified statements also likely increases the listener's respect for the speaker, which we would also expect to relate to opinion change.

Compared to persuasion, the knowledge-gain model of opinion change has little predictive value. Individual-level knowledge gain appears to be nearly orthogonal to opinion change, and has no effect when accounting for persuasion. It seems unlikely that this result is a product of comparatively poor measurement—the 31 knowledge questions consist of both factual and candidate placement questions, providing a rich means to assess the role of knowledge on opinion. Moreover, the results hold when only looking at knowledge questions specific to each of the issues. In these analyses, there is no clear pattern that participants gained, maintained or lost knowledge as a result of deliberation. Of course, it is possible that no survey can measure the kind of knowledge that we expect participants to gain in deliberation. On the other hand, it may be that the issues in question were salient, national issues on which participants already had firm positions rather than relatively narrow policy matters typically interrogated in deliberative studies.

In these analyses movement to more extreme opinions was hardly consistent for individuals and issues (to scale endpoints or toward the initial attitude of the group). The group of individuals adopting more extreme views varies from issue to issue. These results reinforce Chambers' (2003) argument that polarization—conceptualized here as movement to more extreme attitudinal positions—should be understood within and as part of complex psychological processes, rather than as an independent phenomenon.

One explanation for the observed persuasion effects is that direct interactions prompt participants to more systematically consider justified arguments. As Sanders (1997) recognizes in her critique of deliberation, all arguments are not equally constructed (because of intellectual and rhetorical ability), nor are they equally welcomed, nor equally considered (both because of cognitive barriers and because of pernicious biases). Some people and arguments are simply more engaging, salient, or important, and so carry more weight. Nonetheless, even considering that not all arguments are as eloquent or careful as others, the kind of messages exchanged between peers during deliberation are generally more justified and sophisticated than the messages directed toward the group as a whole.

Results show a stronger effect of interactions from liberals on opinion change than for interactions from conservatives. There are several explanations for this. First, there were more liberals in the sample. Second, models of motivated reasoning (see Kunda, 1990; Petersen, Skov, Serritzlew, & Ramsøy et al. 2013) show that information processing is often constrained by ideological positions (Jerit & Barabas, 2006; Wells, Reedy, Gastil, & Lee, 2009). Liberals and conservatives are likely more responsive to information that aligns with their ideological perspective, with these effects magnified by the distribution of liberals in the sample. Nonetheless, the effects of discussion from conservative peers are all in the expected direction and significant in three of four models.

The acceptance of persuasive arguments can be the result of power differentials between group members and perceived levels of status and not just the quality of argumentation (Festinger, 1964; Howland et al., 1954). Individuals sometimes do adopt the opinions of others to comply with the will of higher-status persuaders in order to maintain their own status in small groups (Forsyth, 2000; Kelman, 1961). However, there are good reasons to believe that power imbalances did not cause the observed effects of persuasion in this study. Because participants did not know one another prior to deliberation and because ties were known to end after deliberation, there is no potential for interactions to have been caused by preexisting relationships among participants or a desire to maintain status after discussion. Although I am unable to measure all types of status, the physical elements of status, including height and attraction, are not in play because the deliberation occurred in a voice-only online forum.⁶

This research is limited in several ways. Data were recorded within a deliberative counterfactual designed for the experimental assessment of the consequences of deliberation. Unlike most real-world discussion spaces, attitudinally and sociodemographically heterogeneous peers were present in each discussion group and interaction with dissimilar others was encouraged. Participants were compensated for the time and effort required to deliberate. Deliberation also took place in a digital environment. These conditions, while in many ways different from everyday discussion in the world at large, are roughly similar to other experimental assessments of deliberative opinion change and polarization.

This research also assumes that people with more liberal or conservative views on issues argued “for” their side during discussion. A reading of a random sample of deliberative statements suggests that this is in fact the case, but this analysis was not done for all statements due to resource constraints. It is important for future research to address how often—or if—participants advocate for more moderate or more extreme positions on issues than they indicate in survey responses.

Nonetheless, the design employed here represents a rigorous test of models of deliberative influence. The ability to map statements made among participants, measurement of levels of justification, and topical relevance provides an important lens for some of the social processes at work in the often ambiguously described deliberative *black box*. While controlled laboratory experiments excel in the observation of the effects of well-defined stimuli, it is extremely difficult and perhaps impossible to design a single experiment or even a reasonable set of experiments to control or vary the broad array of psychological processes and personal traits (motivation, baseline information, social bias, etc.) that influence the dynamics of group discussion. Moreover, laboratory studies cannot replicate the complex relationships that develop among participants during deliberation and the give-and-take inherent in deliberation, nor can they be administered to a national sample on a consistent basis due to funding limits.

This research does raise several issues requiring further research. It is important for future research to explore the cognitive mechanisms responsible for responsiveness to persuasive interactions. Evaluation and comparison of the motivated reasoning and heuristic processing models of information processing is especially relevant. Exploring possible framing effects and the possible moderating effect of issue salience on responsiveness to discussion is also important. Evaluation of the relationship between specific knowledge and movement toward specific opinions—that is, that knowledge gains in a specific direction drive opinion in that same direction, or that ideological priors constrain/guide knowledge shifts—is also important to understanding and contextualizing the knowledge results presented in this article. Finally, the Deliberative Poll is just one example of deliberative interaction. The Deliberative Poll provides for more limited and constrained interaction

than un-moderated and natural deliberation. It is important to document how structural and environmental aspects of deliberation moderate or magnify the effects of persuasion.

This research provides a detailed understanding for how deliberative opinion change occurs at the level of individual participants. The implications from this research are clear: Persuasion matters in deliberation and it should be considered in future analysis of deliberative discussion.

Supplemental Material

Supplemental data for this issue can be accessed on the publisher's website at <http://dx.doi.org/10.1080/10584609.2015.1017628>

Notes

1. Transcripts from one small group were missing and were excluded. This leaves a total of 15 groups in all following analyses.

2. Full distributions across the four levels are presented in the results section. Where disagreement occurred the majority ruled.

3. Statistics for item difficulty and discrimination are available in the Supplemental material. Full sample demographics are also included in the Supplemental material.

4. I collapse "inferior justification," "qualified justification," and "sophisticated justification" to create a justified/unjustified dichotomous measure. The justification variable was collapsed because of sparseness. Consideration of each level of justification would be ideal, but there are too few examples of sophisticated and inferior justification across the issues to perform meaningful analysis. There are no significant differences between the three levels of justification, but I cannot determine if this is because there are no differences or if this is because I do not have enough observations at the different levels to identify differences.

5. Each message was not coded for its ideological thrust. I assume that participants voice opinions consistent with their ideological position. A spot check of 100 statements shows this is a reasonable assumption.

6. Statements from those with higher education, which is often associated with status and expertise (see Peterson, 1990; Verba & Nie, 1987), had no effect on attitude change.

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