The Limited Effects of Testimony on Political Persuasion

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Abstract

The procedure of witness testimony and cross-examination under oath, which is institutionalized in the court system and in Congress, may increase the credibility of political messages by strengthening perceived incentives for truth-telling. In this paper, I test the hypothesis that testimony can increase the persuasiveness of empirical claims in realistic political settings. However, results from a large number of experiments, including numerous national survey experiments, indicate that describing statements as being made in Congressional or court testimony rarely generates significant change in respondents' beliefs or attitudes—a result that is robust to numerous experimental design variations.

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Introduction

It is well known that Americans are poorly informed about politics and may change their opinions when provided with relevant policy facts (Carpini and Keeter 1996; Kuklinski et al. 2000; Gilens 2001). However, citizens also tend to have a disconfirmation bias that leads them to reject information that contradicts their preconceptions (Kuklinski et al. 2000; Taber and Lodge 2006). As such, the circumstances under which they will consider new evidence—especially unwelcome evidence—remain unclear.

One possible approach to this problem is to identify institutional conditions that could make new information and evidence more credible to listeners. An obvious candidate is the procedure of delivering testimony. Both the courts and Congress allow witnesses to present testimony and then subject them to cross-examination (by lawyers or members of Congress, respectively) The process of cross-examination provides a mechanism that can reveal false or misleading statements. In addition, most witnesses in Congress (and all witnesses in court) testify under oath and are thus at least potentially susceptible to perjury prosecutions. It is therefore worthwhile to ask whether testimony may increase the persuasiveness of empirical claims about politics.

This paper presents results from numerous experiments, including several national survey experiments, testing the effect of

describing empirical claims about politics as being made in Congressional or court testimony. Regrettably, I show that describing statements as being made in testimony typically has little effect on respondents' factual beliefs, issue opinions, and predicted policy outcomes. These findings are consistent across a wide range of experimental designs.

Can testimony increase persuasiveness?

Studies of political knowledge have exhaustively documented the ways in which the public is poorly informed about politics (e.g. Carpini and Keeter 1996). These knowledge shortfalls appear to be politically consequential—econometric and experimental evidence suggests that members of the public would hold different preferences if they were fully informed (Althaus 1998; Gilens 2001). In particular, members of the public frequently hold mistaken beliefs about important political issues such as welfare (Kuklinski et al. 2000), crime (Gilens 2001), education (Howell and West 2009), the state of the economy (Bartels 2002; Lebo and Cassino 2007), Social Security (Jerit and Barabas 2006), and the war in Iraq (Kull, Ramsay, and Lewis 2003) that can distort their issue preferences (Kuklinski et al. 2000; Gilens 2001; Howell and West 2009). These misperceptions are often highly resistant to correction (Kuklinski et al. 2000; Nyhan and Reifler 2009). More broadly,

citizens may be unwilling to consider new information or evidence about issues even when it is validated by expert opinion. In both cases, the problem is that many important empirical findings about politics are not well-understood by the public. Even when those messages are transmitted to the public, they are frequently rejected or ignored.

Psychological research on goal-directed information processing (i.e. motivated reasoning) provides a compelling explanation of the failure of most efforts to improve citizen knowledge and reduce political misperceptions (for reviews of this literature, see Kunda 1990 and Molden and Higgins 2005). It has been well-understood for decades that people show biases toward messages that confirm their previous views and against messages that contradict or undermine those views (e.g. Lord, Ross, and Lepper 1979 and Edwards and Smith 1996; see also Shapiro and Bloch-Elkon 2008 for a general discussion). This research agenda has recently been extended in political science by Taber and Lodge (2006), who illustrate the often dramatic effects of prior attitudes of evaluations of argument strength.

We should therefore seek to determine the circumstances under which citizens are more likely to consider new information. From a democratic perspective, it would be especially useful if the institutions of government could create conditions in which expert-validated evidence would be more credible to listeners.

One possible source of inspiration comes from the social psychology and marketing literatures, which have conducted a great deal of research demonstrating that high credibility sources are generally more persuasive than low credibility sources (Pornpitakpan 2004). As described above, the institutional procedures used in witness testimony, including the threat of perjury prosecutions and cross-examination, may enhance the credibility of a speaker, serving as a cue to citizens that a speaker's statement is more likely to be accurate (for a discussion of heuristic processing of source cues, see Mondak 1993*a*).

The only published experimental study that is relevant to this hypothesis comes from Lupia (2004), who manipulates whether a statement is described as being made in sworn court testimony (manipulations in brackets, full text in Appendix C)[1]:

> A safety expert who works for {a private company/the federal government} {said that the government/testified under oath that the government} {should remain in charge of/should allow private companies to manage} air traffic control.

Lupia finds that describing the statement as being made in sworn

[1]The Lupia (2004) experiment is inspired by the formal model in Lupia and McCubbins (1998), which predicts that what they call "verification threat" (the possibility that claims will be veried and penalties for lying assessed) can make a speaker persuasive in the absence of common interests with a listener under certain specific conditions (53-58, 250-253). They find support for this hypothesis in stylized experiments concerning predictions of the outcomes of coin flips (133-139). This study does not attempt to test their model, nor is it clear how one could do so in a political context. First, it is not apparent how to measure prior beliefs in terms that correspond to the model. Second, any attempt to do so would prime relevant attitudes, as Lupia notes (2004, 154).

testimony increased the accuracy of subjects' predictions of who will manage air traffic control in the future.

I interpret this result as suggesting that testimony delivered by a witness who is subject to cross-examination and potentially susceptible to perjury prosecutions may be more persuasive to listeners. As such, such statements may lead to greater changes in beliefs and attitudes among listeners than those made under other circumstances.

Experimental design overview

In the experiments that follow, I attempt to measure the effects of describing statements as being made in testimony across a broad range of institutional settings, political issues, and dependent variables. I test the effect of Congressional testimony, the most relevant institutional mechanism in contemporary politics, as well as court testimony. Second, I consider numerous political issues that vary in both complexity and salience. Finally, I test the effect of testimony on three dependent variables—factual beliefs, issue opinions, and predictions of future outcomes—rather than just outcome predictions alone.

The wide variety of experimental designs in the four studies presented below are summarized in Table 1.

[Table 1 about here.]

Study 1 presents data from a national survey experiment measuring opinion change resulting from Congressional testimony in a one-sided and two-sided context for several salient policy proposals. Study 2 reanalyzes the experiment presented in Lupia (2004) and two other experiments from the 1998 Multi-Investigator Survey concerning the effect of court testimony on predictions of future policy outcomes. Study 3 measures the effect of Congressional and court testimony for multiple dependent variables on a student sample. Finally, Study 4, which uses a student/community sample, considers whether a visual image of a speaker swearing an oath increases the effect of the testimony treatment. The experiments embedded in the four studies also test numerous other design variations (these are summarized in Table 1 and described in more detail below):

- whether the proposal in question is attributed to a partisan figure or a political party;
- whether the testimony is explicitly described as being made "under oath";
- whether the speaker is described as an expert or not;
- whether the study is conducted via the phone or the computer;
- whether the speaker makes a positive or negative claim;

- whether the speaker's claim is about the outcome of a policy debate or the consequences of a proposed policy;
- and whether the contrast with witness testimony is a general statement, a statement to the press, or a press release.

Statistical approach

Each of the studies below seeks to estimate the effect of testimony on subject responses to a political message. As such, while these studies also included pure control groups, the statistical analyses that follow directly estimate the treatment effect of testimony by comparing subject responses to otherwise identical messages.[2]

In conducting this analysis, I seek to avoid the epistemological problems of frequentist hypothesis testing, which does not allow us to draw direct conclusions from a failure to reject the null hypothesis (Gill 1999). I instead employ a Bayesian approach, reporting the mean posterior draw $\hat{\beta}$ and the 90% highest posterior density (HPD) region[3] in the text and presenting posterior distributions graphically (Gelman, Pasarica, and Dodhia 2002).[4] In do-

[2]While treatment effects relative to controls may be of substantive interest (and are available upon request), the control group observations are irrelevant to estimating the treatment effect of testimony, which depends on a comparison between two otherwise identical messages. Omitting controls in this way does not materially affect the results and dramatically simplifies exposition.

[3]While the HPD credible interval often corresponds to a frequentist confidence interval when we have uniform priors, it is based on a Bayesian approach to statistical inference and thus can be directly interpreted. The HPD region can be defined formally in the following manner (Knight 2000, 350). If $\pi(\theta|x)$ is a posterior density of θ on $\Theta \subset R$, then a region $C = C(x)$ is the highest posterior density region of content p if $\int_C \pi(\theta|x)d\theta = p$ and $\pi(\theta|x) \geq \pi(\theta^*|x)$ for any $\theta \in C$ and $\theta^* \notin C$. If the posterior density is unimodal (as it is in all cases considered in this paper), the z% HPD region represents the shortest interval containing z% of the posterior density.

[4]All model results were estimated using the MCMCpack ordered probit and probit functions in

ing so, I hope to model a more coherent and effective framework for presenting so-called "null" results. (Appendix A presents supporting model results in tabular format.)

I estimate the following two ordered probit models in Studies 1, 3, and 4 under standard assumptions[5] (the probit models in Study 2 are defined analogously):

$$y_i^* = \beta_0 + \beta_1 \times \text{Testimony} + \beta_2 \times \text{GOP} + \beta_3 \times \text{Knowledge} + \epsilon_i \quad (1)$$

$$y_i^* = \beta_0 + \beta_1 \times \text{Testimony} + \beta_2 \times \text{GOP} + \beta_3 \times \text{Knowledge} + \beta_4 \times \text{Testimony} \times \text{GOP} + \epsilon_i \quad (2)$$

As noted above, these models include controls for party, which I operationalize using Republican party identification[6], and political knowledge to improve statistical efficiency.[7]

For the model described in equation 1, the quantity of interest is the highest posterior density of β_1, the coefficient for testimony. Specifically, we seek to determine if the 90% HPD of β_1 does not include zero (i.e. $0 \notin \text{HPD}(\beta_1)$). However, due to theoretical concerns that responses to testimony may differ depending on subjects' prior beliefs, I also test for an interaction between party and the testimony treatment using the model described in equation 2.

R with an improper uniform prior on β centered at 0 (Martin and Quinn 2006). HPD regions were calculated using the coda package in R (Plummer et al. 2006).

[5]Following normal practice for ordered probit, I assume $y_i = x_i'\beta + \epsilon_i$, that $y_i = j$ if $\tau_{j-1} \leq y_i^* < \tau_j$ for $j \in 1, ..., k$ (where k is the number of ordered categories of the dependent variable) and that $\epsilon_i \sim N(0, 1)$. The first cutpoint is normalized to zero.

[6]This measure is defined to include leaners.

[7]It is reasonable to wonder whether treatment effects differ by political knowledge. However, when we interact the testimony treatment with political knowledge, the interaction term is only statistically significant at the .90 level in three models out of more than thirty (results available upon request). The issue is thus not considered further.

I then estimate the posterior densities of the testimony treatment effect separately by party (i.e. β_1 for non-Republicans and $\beta_1 + \beta_4$ for Republicans) and plot them separately if the 90% highest posterior density region includes zero for only one group.[8]

Study 1: Salient issues (national sample)

I first present a national survey experiment that assesses the effects of Congressional testimony on responses to issue frames. To maximize realism and comparability to previous research, I consider both the context of a single frame, as in the original experiment, and competing frames, which is a more realistic representation of political debate (Sniderman and Theriault 2004; Jackman and Sniderman 2006). The experiment was thus a 2×2 between-subjects design with a control group.[9]

Each issue prompt begins with a description of a political figure or group advocating a proposal based on some empirical rationale. In the one-sided treatments, subjects are told that the rationale was expressed either in a press release or in Congressional testimony. In the two-sided treatments, subjects are also told that an opposing partisan or non-partisan expert has expressed a con-

[8] In this sense, I follow Brambor, Clark, and Golder (2006), who advocate considering marginal effects of variables of interest over the range of an interacting variable rather than focusing on the significance of the interaction term itself.

[9] At the beginning of the experiment, each respondent was assigned to a control group with a 20 percent probability. Controls did not receive any messages and were simply asked for issue opinions. Non-controls were randomly assigned to experimental conditions on a question-by-question basis. The order of questions was also randomly varied.

tradictory view in a press release or Congressional testimony.[10]

These institutional contexts were chosen to maximize the difference in the likelihood that a political statement would be verified and that a speaker would be sanctioned for lying. Witnesses during Congressional hearings are regularly interrupted by legislators and challenged on their claims (see, e.g., Mattei 1998, 451–453). Most (though not all) witnesses before Congress also testify under oath, which means that lies or misrepresentations could constitute perjury. By contrast, claims made in political press releases are much less likely to be challenged directly. Many are ignored, while those that are covered are often treated deferentially. For instance, Sellers (2000) found that national news coverage frequently conveyed themes emphasized in legislator press releases. Similarly, releases issued by members of Congress are often reprinted or lightly rewritten in local news outlets (Polk, Eddy, and Andre 1975; Grimmer N.d.). At a more general level, the journalistic ideal of objectivity tends to lead reporters to cover political debates in a "he said," "she said" style (e.g., Cunningham 2003). As a result, very few press releases are subject to extensive fact-checking or critical scrutiny.[11]

To illustrate the design, here are the treatments for Social Secu-

[10]The proposer's statement is always made in a press release in the two-sided treatments in order to limit the number of conditions and to generate a contrast with the counter-argument expressed in testimony.

[11]The results from this study are consistent with those from Studies 2–4 below, which vary the institutional setting for both the verification threat condition (Congressional or court testimony) and the non-verification threat contrast condition (a press release or a public statement).

rity (manipulated wording in brackets):

> *One frame:* President Bush has proposed allowing younger workers to invest a portion of their Social Security taxes in stocks and bonds. {In a press release, White House officials claim / White House officials have testified before Congress} that these private accounts would offer a higher rate of return.
>
> *Two frames:* President Bush has proposed allowing younger workers to invest a portion of their Social Security taxes in stocks and bonds. In a press release, White House officials claim that these private accounts would offer a higher rate of return, but Democrats have {issued an opposing press release / testified before Congress} claiming that the only way to pay for these private accounts is with deep benefit cuts in the future.

Four different issues are tested: private accounts in Social Security, limitations on medical malpractice lawsuits, reimportation of prescription drugs, and withdrawal from Iraq. (See Appendix B for full script.) These issues were selected to be salient and factually controversial, to vary in difficulty, and to be balanced with respect to partisanship.[12] In the two-sided context, I present conflicting partisan viewpoints on Social Security and prescription

[12]The proposer was either a well-known politician or a group of party members (e.g. "some Republicans"). No obvious differences were found across issues based on this difference.

drugs and a partisan viewpoint contradicted by a non-partisan expert on medical malpractice lawsuits.[13]

The design of these experiments departs from prevailing practice in three important respects. First, the treatments attribute messages to parties or political figures because the media usually do so in their reporting.[14] Contrary to Kuklinski et al. (2000) and Gilens (2001), I also present facts to subjects as contested, which again follows standard practice in news reports. Finally, I focus on Congressional testimony, which is more common in national politics than court testimony, and state that a political figure "testified before Congress" in the verification threat condition.[15]

A national telephone-based survey experiment was conducted from November 3, 2005 to February 7, 2006. Responses were collected from 514 randomly selected individuals who were reasonably representative of national averages.[16] Using branching questions, I created a four-point issue opinion scale for use as a dependent variable.[17] Table 2 presents mean issue opinions by cell:

[13]Due to a typographical error, the two-sided testimony condition for US withdrawal from Iraq was invalidated. Subjects in that condition were dropped from all results.

[14]While attributing messages to parties and political figures may limit framing effects (see, e.g., (1990; 1993*a*; 1993*b*; 1993; 2002; 1994), research that presents messages to subjects without identifying the speakers may generate misleading results (Druckman 2001; Sniderman and Tomz 2005). Studies 2-4 below do not attribute proposals in this way.

[15]I use "testified before Congress" rather than "testified under oath" because Congressional testimony is not always made under oath and it may suggest an endorsement to subjects. However, Studies 2-4 below use the "under oath" phrase and also consider testimony in court.

[16]Women, the college educated, and higher income earners were somewhat overrepresented, while Latinos and blacks were somewhat underrepresented. 34% of respondents identified as Republicans, 32% as Democrats, and 27% as independents.

[17]Only a handful of respondents failed to answer all four issue questions, so non-responses were dropped from the data by question.

[Table 2 about here.]

Under a naïve model, one might assume that positive frames would consistently increase support for a proposal, negative frames would consistently decrease support, and that testimony would enhance these issue framing effects. If so, we would expect the following ordering of support for the proposal across the four experimental conditions from most to least supportive (expectations for the control group are not clear):

1. One-sided frame, testimony
2. One-sided frame, no testimony
3. Two-sided framing, no testimony for second claim
4. Two-sided framing, testimony for second claim

As Table 2 makes clear, however, the pattern is more complex. Only the findings for Iraq are consistent with the ordering above, and none of the treatment means are statistically distinct from each other on any issue. To disentangle these results, I therefore estimate the treatment effect of testimony using separate Bayesian ordered probit models for subjects in the one-sided and two-sided conditions. As described above, the models include a variable for testimony and controls for GOP party membership and political knowledge to improve efficiency.[18] As noted above, I also test for party interactions and plot posterior densities separately for Re-

[18] I constructed a political knowledge scale from three questions about current events in the same TESS module ($\alpha = .59$, wording available upon request). I thank Markus Prior for these data.

publicans and non-Republicans when the 90% highest posterior density region includes zero for only one group.

Figure 1 presents the posterior densities for the treatment effect of testimony in a one-sided context. Since it supports the proposer's empirical claim, we expect a positive effect.

[Figure 1 about here.]

However, we find minimal overall treatment effects on all four issues. The posterior density of the treatment effect is closely centered about zero for Social Security private accounts ($\hat{\beta}$ = -.11, 90% HPD: [-.33, .10]), limitations on medical malpractice lawsuits ($\hat{\beta}$ = .00, 90% HPD: [-.21, .20]), and withdrawal from Iraq ($\hat{\beta}$ = .09, 90% HPD: [-.13, .32]). The one exception is prescription drugs, where non-Republicans responded favorably to testimony supporting a proposal attributed to former Vermont governor Howard Dean ($\hat{\beta}$ = .51, 90% HPD: [.20, .80]), whereas Republicans tilted in the opposite direction ($\hat{\beta}$ = -.25, 90% HPD: [-.56, .07]).[19]

Figure 2 presents a similar plot of posterior densities by issue for witness testimony in the context of competing frames. In this case, the existence of Congressional testimony is manipulated for the counter-frame, so we expect a negative treatment effect on support for the proposed policy.

[Figure 2 about here.]

[19]The overall treatment effect in the pooled model for prescription drugs (one frame) is positive but the 90% HPD region includes zero ($\hat{\beta}$ = .16 , 90% HPD: [-.07, .36]).

In the two-sided case, the treatment effects differ by party for two of three issues. On Social Security, the treatment effect for non-Republicans is negative ($\hat{\beta}$ = -.36, 90% HPD: [-.63, -.10]) but centered about zero for Republicans ($\hat{\beta}$ = .05, 90% HPD: [-.28, .39]).[20] This pattern is consistent with a pattern of motivated reasoning by subjects with partisan predispositions. However, the medical malpractice treatment effect, which we might expect to reduce support for the proposal by non-Republicans, actually works in the opposite direction. The treatment effect is negative for Republicans ($\hat{\beta}$ = -.41, 90% HPD: [-.79, -.04]) but centered near zero for non-Republicans ($\hat{\beta}$ = -.12, 90% HPD: [-.38, .14]). The overall treatment effect for medical malpractice in the pooled model is negative, though the magnitude of the estimated effect is substantially closer to zero ($\hat{\beta}$ = -.21, 90% HPD: [-.44, -.00]). This difference may be attributable to the difference in the source of the counter-frame. In the Social Security prompt, it is attributed to Democrats, whereas the medical malpractice counter-frame is attributed to the non-partisan Congressional Budget Office. Finally, the testimony treatment effect for prescription drug reimportation is centered near zero ($\hat{\beta}$ = -.11, 90% HPD: [-.31, .09]).

These results provide limited support for the effectiveness of testimony in facilitating opinion change on salient policy issues.

[20]The overall treatment effect in the pooled model for Social Security (two frames) is negative but the 90% HPD region includes zero ($\hat{\beta}$ = -.19, 90% HPD: [-.40, .01]).

Overall treatment effects in the one-sided context were centered near zero for all four issues tested. However, modestly negative treatment effects were observed for two of three issues tested in the two-sided context. In two cases, the treatment effect differed by party in direction that were consistent with motivated reasoning (prescription drug, one frame; Social Security, two frames). However, in one case, describing a negative message about medical malpractice from a neutral source as being made in Congressional testimony induces significant opinion change among Republicans. This result may indicate that the testimony manipulation is more effective when the speaker is non-partisan (a possibility that is tested more extensively in the following three studies).

Study 2: Reanalysis of 1998 MIS (national sample)

Based on the results of Study 1, I reanalyzed the air traffic control experiment from Lupia (2004) and two other verification threat experiments that were part of the 1998 Multi-Investigator Survey, a national random-digit telephone survey of 1,067 respondents[21] that included experiments from a large number of researchers. The study codebook describes verification threat experiments concerning predictions about policy outcomes for management of air traffic control, Medicare premiums, and regulations requir-

[21]The sample was 9% black and 3% Latino with a mean age of 46 and a relatively even distribution of Republicans (41%), independents (10.5%), and Democrats (48.5%).

ing side-impact airbags in cars (see Appendix C).[22] These experiments manipulated message source, content, and whether the statement was made in sworn testimony.[23] Respondents were given two choices of possible policy outcomes. The dependent variable was coded 1 if respondents chose the outcome that experts believed to be more likely and 0 otherwise.[24]

The experiments in Study 2 from the 1998 MIS differ in several important respects from those in Study 1. First, the effect of subject priors should be weaker. Unlike the first study, two of the issues—air traffic control and side-impact airbags—were arguably not high salience; all three omit ideological and partisan cues (including an identification of the proposer); and in each case the dependent variable is defined as the prediction of a policy outcome rather than a policy opinion. Second, the effect of the manipulation should be greater. Each experiment uses the phrase "testified under oath" to describe a statement in court; two of the studies (air traffic control and side-impact airbags) describe the speaker as an expert (a feature that was included only in the two-sided Medicare experiment in Study 1); and each experiment

[22]The data and codebook were downloaded from UC-Berkeley's Survey Documentation & Analysis website (sda.berkeley.edu).

[23]The instrument states that "Our next questions focus on some issues being discussed in Washington D.C. these days" and refers to an "important debate" over "how best to promote airline safety" and "debate[s]" over Medicare and side-impact airbags. As such, respondents are likely to have viewed the speakers as participants in these debates and to have interpreted their statements in both the verification threat and non-verification threat conditions as publicly made.

[24]The most likely outcomes were, respectively, that the federal government would continue to manage air traffic control, that Medicare premiums would be left the same, and that side-impact airbags would be required by the federal government.

uses a one-sided design (preventing subjects from being exposed to contrasting points of view). All of these differences should increase the likelihood that court testimony would have a significant effect on subject responses.

Following the same procedure as Study 1, I estimate the treatment effects of court testimony for respondents who received otherwise identical messages controlling for political knowledge and party and testing for a treatment interactions with party (I pool across message source, which Lupia finds makes no difference).[25] Figure 3 presents estimated treatment effects from probit models for the three issues. Because each experiment includes only one frame, the expected effect is positive when the message content includes the more likely answer (the left column) and negative when it includes the less likely answer (the right column).

[Figure 3 about here.]

For the air traffic control experiment analyzed in Lupia (2004), we observe the predicted effect—court testimony increased the likelihood of giving the answer supplied by the source. When the message is that air traffic control is likely to be run by the government, the testimony treatment increases the likelihood that the respondent will provide that answer ($\hat{\beta}$ = .30, 90% HPD: [.08,

[25] I almost precisely replicated the model reported in Lupia (2004), but follow the same estimation approach as Study 1 here to focus specifically on estimating the treatment effect of court testimony (results available upon request).

.51]).[26] Likewise, when the message states that private companies will manage air traffic control, the testimony treatment appears to reduce the likelihood that respondents would predict federal government management, though the 90% HPD region just includes zero ($\hat{\beta}$ = -.18, 90% HPD: [-.37, .00]).

However, the other two experiments showed minimal effects. Court testimony stating that side-impact air bags would be mandated had a positive effect on the likelihood that Republicans would make that prediction ($\hat{\beta}$ = .28, 90% HPD: [.02, .53]) but not non-Republicans ($\hat{\beta}$ = -.02, 90% HPD: [-.22, .19]) and the pooled treatment effect was centered near zero ($\hat{\beta}$ = .09, 90% HPD: [-.06, .25]). In addition, testimony manipulations had minimal effects on subjects' beliefs that side-impact air bags would not be mandated ($\hat{\beta}$ = .04, 90% HPD: [-.13, .20]) and that Medicare premiums would be raised ($\hat{\beta}$ = .01, 90% HPD: [-.16, .18]) or left at current levels ($\hat{\beta}$ = -.05, 90% HPD: [-.21, .11]).

In short, despite a more favorable design (including the use of experts as speakers), the testimony manipulation failed to have the expected effect on two of the three issues considered.

[26]The effect differs slightly by party—the estimated effect for non-Republicans ($\hat{\beta}$ = .32, 90% HPD: [.04, .60]) is slightly higher than for Republicans ($\hat{\beta}$ = .24, 90% HPD: [-.09, .58]).

Study 3: More dependent variables (student sample)

A more comprehensive study was subsequently conducted that expanded the range of dependent variables considered. Rather than simply considering policy preferences (as in Study 1) or policy outcomes (Study 2), Study 3 considered the effect of testimony on empirical beliefs, policy predictions, *and* policy outcomes (see Appendix D for wording).

The first component of Study 3 dealt with the issues of air traffic control, side-impact air bags regulation, and Social Security private accounts. The first two issues, which were adapted from Study 2, were chosen because they are less salient (and thus more likely to show experimental effects), while the third (Social Security), was chosen as a more salient comparison. In each case, a proposal was outlined and then an empirical claim about its potential effects was presented as being made in sworn testimony or not.[27] The empirical claims presented supported the air traffic control and side-impact air bag proposals but undermined the Social Security proposal. Subjects were then asked whether they agreed with the empirical claim, whether the proposal would become policy, and whether the proposal *should* become policy. Each dependent variable was measured on a five-point Likert scale.

A separate experiment was conducted for the issue of outsourc-

[27] In this sense, the design is more like the one-sided experiments in Study 1 since the messages in Study 2 were simply predictions of future outcomes.

ing. In this case, there were two treatment groups and a control group. One treatment group was told that the testimony was delivered in court (as in Study 2) while the other was told it was delivered before Congress (as in Study 1), allowing us to test whether the institutional setting affects the testimony treatment effect.[28]

As in Study 2, several aspects of the study should maximize the effect of the testimony manipulations. First, the prompts did not identify proponents of the proposals in question, preventing the use of partisan or ideological heuristics. Second, the speakers were described as independent experts, which should increase the credibility of their claims. Third, each testimony manipulation stated that the expert had testified "under oath." (The contrast condition for speakers who were not described as testifying was a statement to the press rather than a press release as in Study 1.) Finally, each study again used a one-sided design.

Study 3 was conducted via the Internet from April 11 to May 31, 2007 at a southeastern research university. Responses were collected online using Viewsflash survey software from a sample of 283 undergraduate students who live in the US and responded to an ad displayed to students on Facebook.[29]

[28]To address possible variation in subjects' perceptions of Congressional and court testimony, a scale was constructed measuring the credibility subjects attached to testimony in court and before Congress. Scale reliability was low and responses did not moderate the effects of the testimony manipulations, so the issue is not discussed further (wording and results available upon request).

[29]The sample was balanced by gender and diverse with respect to both geography and race (32% identified as non-white). Politically, approximately 26% of respondents identified as Republicans, 46% as Democrats, and 28% as independents.

The first row of Figure 4 presents treatment effects on subjects' beliefs in the claim made in the prompt (for instance, whether private management of air traffic control towers costs less than government management and does not compromise safety). In each case, the effect is expected to be positive.

[Figure 4 about here.]

We observe, however, that the posterior density for the treatment effect is centered near zero for all three issues: side-impact airbag regulation ($\hat{\beta}$ = .06, 90% HPD: [-.18, .29], private management of air traffic control ($\hat{\beta}$ = .10, 90% HPD: [-.12, .32]), and Social Security private accounts ($\hat{\beta}$ = -.04, 90% HPD: [-.27, .18]).

In the second row of Figure 4, we plot estimated treatment effects for predictions about policy outcomes. In this case, we expect the treatment to *increase* agreement on air traffic control and air bags (since the empirical claim reinforced those proposals) and to *decrease* agreement on Social Security (since the claim undermined that proposal). Once again, however, the treatment effects are closely centered around zero for airbags ($\hat{\beta}$ = -.02, 90% HPD: [-.25, .20]), air traffic control ($\hat{\beta}$ = .05, 90% HPD: [-.17, .28]), and Social Security ($\hat{\beta}$ = .00, 90% HPD: [-.22, .24]). The shift from facts to predictions makes no clear difference.

Finally, the third row of Figure 4 plots treatment effects for testimony on policy opinions. Expectations are the same as the pre-

vious figure (positive for air traffic control and air bags, negative on Social Security). For the third time, we observe no clear effects for airbags ($\hat{\beta}$ = -.07, 90% HPD: [-.29, .16]). The results for air traffic control ($\hat{\beta}$ = .19, 90% HPD: [-.03, .41]) are modestly positive but not clearly different from zero, while the Social Security treatment effect is also modestly positive ($\hat{\beta}$ = .19, 90% HPD: [-.03, .43])—the opposite of the expected direction—though again not clearly different from zero.

Results from the experiment contrasting Congress and court testimony are presented in Figure 5, which plots the treatment effects separately relative to controls. In this case, we expect a positive effect on belief in the empirical claim (which states that outsourcing benefits the economy) but a negative effect on the policy prediction and opinion questions (which ask if government outsourcing will be banned and whether it should be banned).

[Figure 5 about here.]

In each case, the distributions are closely overlapping. The treatment effects of testimony in Congress and court are not distinguishable from zero for empirical beliefs ($\hat{\beta}$ = .22, 90% HPD: [-.04, .49] and ($\hat{\beta}$ = .06, 90% HPD: [-.20, .31]), respectively) and issue opinion ($\hat{\beta}$ = -.10, 90% HPD: [-.37, .16] and $\hat{\beta}$ = -.02, 90% HPD: [-.26, .24], respectively). Treatment effects for predicted policy outcomes are not substantial except for the effect of Congres-

sional testimony on non-Republicans ($\hat{\beta}$ = -.32, 90% HPD: [-.64, -.00]). After hearing that an economist testified before Congress (which was controlled by Republicans at the time) that outsourcing helps the economy, non-Republicans were substantially less likely to predict that federal outsourcing would be banned in the next five years. (In this sense, they may be making a reasonable inference about the political likelihood of an event rather than gaining greater confidence in the empirical claim itself.) The estimated effects of court and Congressional testimony on predicted outcomes were otherwise not distinguishable from zero.[30]

Study 4: Visual prompt (student/community sample)

A final study was conducted to test whether the iconic image of a witness raising their hand while swearing an oath to tell the truth would make the testimony manipulation more effective. 102 students and community members at a southeastern research university took part in Study 4, which was administered on laptops at public settings on campus from July 10 to August 1, 2007.[31]

In this study, each subject was administered the air traffic control experiment from Study 3. However, participants also saw

[30]Testimony in Congress for Republicans: $\hat{\beta}$ = .39, 90% HPD: [-.14, .91]. Testimony in court for Republicans: $\hat{\beta}$ = -.33, 90% HPD: [-.82, .19]. Testimony in court for non-Republicans: $\hat{\beta}$ = -.03, 90% HPD: [-.33, .28].

[31]Of the 102 respondents, 42 were women and 60 men. The sample was highly racially diverse, with 21% identifying as African American, 24% as Asian American, and 7% as Latino. 75 subjects were between the ages of 18 and 22. 19 percent identified as Republicans, 41 percent as independents, and 40 percent as Democrats.

one of the images in Figure 6 while reading the prompt. Subjects in the non-testimony condition saw an image of a man speaking at a press conference (the picture in the top portion of the figure), while those in the testimony condition viewed an image of a man with his arm raised taking an oath at a hearing (the picture on the bottom portion of the figure).[32]

[Figure 6 about here.]

Subjects were then asked about the same three dependent variables as Study 3: belief in the empirical claim, prediction of future policy outcome, and policy opinion.

Because the empirical claim in question supported the proposal, the expected effect of the testimony manipulation on factual beliefs, predicted outcomes, and policy opinions is positive. However, despite the visual reinforcement of the manipulation, Figure 7 illustrates that it once again had no substantial effect on any dependent variable.

[Figure 7 about here.]

The treatment effect was not statistically distinguishable from zero for the empirical claim ($\hat{\beta}$ = -.02, 90% HPD: [-.38, .35]), the prediction of future policy ($\hat{\beta}$ = .20, 90% HPD: [-.17, .56]), or policy opinion ($\hat{\beta}$ = -.26, 90% HPD: [-.61, .11]). Visual reinforcement does not appear to enhance the testimony treatment effect.

[32]The control group was omitted.

Discussion

Across numerous experiments, I find little evidence that court or Congressional testimony increases the effect of issue frames in realistic political settings. This conclusion holds for issues of varying complexity and salience on three related dependent variables: belief in empirical claims, personal issue opinions, and predictions of future policy outcomes. The estimated overall treatment effects of testimony manipulations for these dependent variables, respectively, are summarized in Figures 8a, 8b, and 8c:

[Figure 8 about here.]

In almost every case, the 90% HPD of the estimated treatment effect includes zero. Providing a visual reinforcement of the witness oath does not appear to make a significant difference (Study 4), nor does the institutional setting (court or Congress), the explicit description of the witness as being "under oath," attributing the claim that is being contradicted to a public figure, the comparison statement condition (a general statement, a statement to the press, or a press release), the mode of the experiment (phone- or computer-based), the subject pool (general population or convenience samples), the direction of the claim (positive or negative), its content (a prediction of a policy outcome or a claim about policy consequences), or the expertise of the speaker.

While this finding is disappointing, we must keep in mind that scientific progress comes from the publication of positive *and* negative results. Indeed, a misplaced emphasis on statistical significance has led to indications of publication bias in top political science journals (Gerber and Malhotra 2008). One problem may be the difficulties associated with presenting and interpreting non-significant statistical results in a frequentist framework. Along those lines, this article has attempted to demonstrate how a Bayesian approach can aid in the effective presentation of so-called "null" results and avoid the inferential difficulties associated with frequentist hypothesis testing.

Conclusion

This study provides substantial evidence that describing statements as being made in court or Congressional testimony has limited effects on citizens' attitudes and beliefs. While it is possible to construct stylized experiments in which the possibility of witness sanctions (i.e. penalties for lying and public verification of speaker claims) can make a speaker more persuasive[33], the results presented above suggest that testimony in the American political and legal system is likely to prove less influential under realistic conditions. This finding could be the result of the fact

[33]See, for instance, the dice-rolling experiments in Lupia and McCubbins (1998) and the math problem experiments in Boudreau (2006) and Boudreau (2009).

that perjury prosecutions are quite rare, particularly in cases in which a witness is expressing an opinion about a policy issue or outcome. As such, the circumstances under which the mass public *will* be open to new factual evidence, particularly when that evidence cuts against their prior beliefs, remain unclear.

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Appendix A: Statistical results in tabular format

Table A1: Figures 1-2 (ordered probit)

	One-sided				Two-sided		
	Soc. Sec.	Medicare	RX drugs	Iraq	Soc. Sec.	Medicare	RX drugs
	Mean (90% HPD)	Mean (90% HPD)	Mean (90% HPD)	Mean (90% HPD)	Mean (90% HPD)	Mean (90% HPD)	Mean (90% HPD)
Testimony	-0.11	0.00	0.51	0.09	-0.36	-0.12	-0.11
	(-.33, .10)	(-.21, .20)	(.20,.80)	(-.13, .32)	(-.63, -.10)	(-.38, .14)	(-.31, .09)
GOP	0.96	0.73	-0.24	-1.07	0.88	0.78	-0.39
	(.79, 1.13)	(.56, .91)	(-.43, -.05)	(-1.24, -.89)	(.68, 1.07)	(.58, .97)	(-.55, -.21)
Knowledge	-0.15	-0.01	0.14	-0.28	-0.15	-0.01	0.14
	(-0.26, -0.04)	(-.13,.10)	(.03, .26)	(-.39, -.16)	(-.26, -.03)	(-.12, .11)	(.02, .25)
GOP * VT			-0.76		0.41	-0.29	
			(-1.20, -.32)		(-.01, .84)	(-.76, .16)	
Constant	0.27	0.64	1.20	0.92	0.33	0.66	1.30
	(0.15, 0.39)	(0.52, 0.77)	(1.04, 1.34)	(.78, 1.05)	(.19, .45)	(.52, .79)	(1.15, 1.46)
γ_2	0.44	0.36	0.40	0.62	0.44	0.36	0.39
	(0.37, 0.53)	(.29, .44)	(.31, .49)	(.53, .71)	(.37, .52)	(.27, .44)	(.29, .49)
γ_3	1.07	0.95	1.09	0.94	1.08	0.95	1.07
	(0.96, 1.19)	(.86, 1.06)	(.97, 1.22)	(.83, 1.06)	(.96, 1.19)	(.83, 1.07)	(.94, 1.22)
N	202	213	192	191	197	187	208

Table A2: Figure 3 (probit)

	Air traffic		Medicare		Side air bags	
	Govt.	Private	Raise	Not raise	Require	Not require
	Mean (90% HPD)	Mean (90% HPD)	Mean (90% HPD)	Mean (90% HPD)	Mean (90% HPD)	Mean (90% HPD)
Testimony	0.32	-0.18	0.01	-0.05	-0.02	0.04
	(.04, .60)	(-0.37, .00)	(-.16, .18)	(-.21, .11)	(-.22, .19)	(-.13, .20)
GOP	-0.10	-0.13	-0.04	-0.04	-0.20	-0.14
	(-.28, .06)	(-.29, .04)	(-.17, .09)	(-.18, .09)	(-.35, -.05)	(-.28, -.00)
Knowledge	0.40	0.40	0.17	0.17	-0.50	-0.51
	(.27, .53)	(.27, .53)	(.06, .29)	(.05, .28)	(-.61, -.39)	(-.62, -.39)
GOP * VT	-0.08				0.30	
	(-.54, .33)				(-.00, .64)	
Constant	0.97	1.07	-0.19	-0.17	0.03	0.02
	(.86, 1.08)	(.95, 1.18)	(-.28, -.10)	(-.27,-.08)	(-.07, .12)	(-.07, .11)
N	409	417	423	428	435	420

Table A3: Figure 4 (ordered probit)

	Empirical belief			**Policy prediction**			**Policy opinion**		
	Air bags	ATC	Soc. Sec.	Air bags	ATC	Soc. Sec.	Air bags	ATC	Soc. Sec.
	Mean (90% HPD)	Mean (90% HPD)	Mean (90% HPD)	Mean (90% HPD)	Mean (90% HPD)	Mean (90% HPD)	Mean (90% HPD)	Mean (90% HPD)	Mean (90% HPD)
Testimony	0.06	0.10	-0.04	-0.02	0.05	0.00	-0.07	0.19	0.19
	(-.18, .29)	(-.12, .32)	(-.27, .18)	(-.25, .20)	(-.17, .28)	(-.22, .24)	(-.29, .16)	(-.03, .41)	(-.03, .43)
GOP	-0.11	0.26	-0.54	0.21	0.08	0.08	-0.13	0.35	0.85
	(-.36, .16)	(.02, .51)	(-.78, -.29)	(-.04, .45)	(-.16, .32)	(-.15, .33)	(-.37, .13)	(.10, .58)	(.61, 1.10)
Knowledge	0.09	0.13	0.01	-0.15	-0.30	-0.33	-0.26	-0.04	-0.19
	(-.10, .29)	(-.06, .31)	(-.18, .18)	(-.34, .04)	(-.49, -.12)	(-.52, -.15)	(-.46, -.08)	(-.22, .15)	(-.38, -.00)
Constant	2.56	1.54	1.61	2.09	1.16	1.39	1.95	1.21	0.88
	(2.21, 2.92)	(1.35, 1.73)	(1.40, 1.83)	(1.78, 2.39)	(.98, 1.34)	(1.19, 1.60)	(1.71, 2.18)	(1.02, 1.40)	(.72, 1.05)
γ_2	1.11	1.02	1.15	1.32	1.21	1.38	1.03	1.13	0.82
	(.74, 1.45)	(.87, 1.17)	(.98, 1.36)	(1.01, 1.58)	(1.08, 1.37)	(1.20, 1.58)	(.86, 1.21)	(.97, 1.31)	(.70, .96)
γ_3	2.86	2.62	2.40	2.68	2.74	2.92	2.10	2.50	1.84
	(2.54, 3.20)	(2.48, 2.80)	(2.20, 2.62)	(2.38, 2.95)	(2.50, 2.97)	(2.68, 3.16)	(1.86, 2.31)	(2.30, 2.72)	(1.69, 1.99)
N	192	193	193	192	192	193	192	193	192

Table A4: Figure 5 (ordered probit)

	Empirical belief	Policy prediction	Policy opinion
	Mean (90% HPD)	Mean (90% HPD)	Mean (90% HPD)
Testimony (Cong.)	0.22	-0.32	-0.10
	(-.04, .49)	(-.64, -.00)	(-.37, .16)
Testimony (court)	0.06	-0.03	-0.02
	(-.20, .31)	(-.33, .28)	(-.26, .24)
GOP	0.30	-0.03	-0.07
	(.05, .54)	(-.47, .38)	(-.31, .17)
Knowledge	0.15	-0.26	-0.36
	(-.04, .33)	(-.45, -.07)	(-.55, -.18)
GOP * VT (Cong.)		0.71	
		(.11, 1.35)	
GOP * VT (court)		-0.30	
		(-.87, .31)	
Constant	1.46	0.97	0.84
	(1.19, 1.71)	(.72, 1.21)	(.62, 1.04)
γ_2	0.99	1.52	1.15
	(.80, 1.17)	(1.36, 1.69)	(1.03, 1.31)
γ_3	2.45	3.03	2.43
	(2.21, 2.68)	(2.80, 3.32)	(2.23, 2.64)
N	283	283	283

Table A5: Figure 6 (ordered probit)

	Empirical belief	Policy prediction	Policy opinion
	Mean (90% HPD)	Mean (90% HPD)	Mean (90% HPD)
Testimony	-0.02	0.20	-0.26
	(-.38, .35)	(-.17, .56)	(-.61, .11)
GOP	0.27	0.48	0.28
	(-.18, .72)	(.03, .94)	(-.16, .74)
Knowledge	0.10	-0.38	-0.38
	(-.18, .39)	(-.67, -.10)	(-.66, -.09)
Constant	1.40	1.81	1.30
	(1.03, 1.77)	(1.42, 2.21)	(.95, 1.69)
γ_2	0.61	1.16	0.81
	(.38, .81)	(.92, 1.45)	(.53, 1.07)
γ_3	1.39	2.03	1.47
	(1.12, 1.62)	(1.71, 2.31)	(1.18, 1.78)
γ_4	2.43	3.13	2.33
	(2.13, 2.73)	(2.75, 3.43)	(2.00, 2.60)
N	102	102	102

Appendix B: Study 1 wording

[Statements in brackets were varied depending on question order, the specific one- or two-sided treatment condition, and the subject's response to the initial agree/disagree question. Controls did not receive the issue prompts.]

Introduction

I'm now going to tell you about a series of political issues. I will then read you a statement expressing an opinion about each issue, and ask whether you agree or disagree with that statement. Please listen carefully to the information provided and then indicate your reaction to each statement.

Social Security

{First / Next}, I'm going to {tell / ask} you about the issue of Social Security.

One-sided conditions

President Bush has proposed allowing younger workers to invest a portion of their Social Security taxes in stocks and bonds. {In a press release, White House officials claim / White House officials have testified before Congress} that these private accounts would offer a higher rate of return.

Two-sided conditions

President Bush has proposed allowing younger workers to invest a portion of their Social Security taxes in stocks and bonds. In a press release, White House officials claim that these private accounts would offer a higher rate of return, but Democrats have {issued an opposing press release claiming / testified before Congress} that the only way to pay for these private accounts is with deep benefit cuts in the future.

Issue opinion (including controls)

Now I'm going to ask you what you think about this issue. Do you agree or disagree that younger workers should be allowed to invest a portion of their Social Security taxes in stocks and bonds? Do you strongly {agree/disagree} or only somewhat {agree/ disagree}?

Prescription drugs

{First / Next}, I'm going to {tell / ask} you about the issue of prescription drugs.

One-sided conditions

Howard Dean has proposed allowing Americans to import prescription drugs from Canada. {In a press release, he claims / He has testified before Congress} that Canadian drugs are safe and cheaper than U.S. drugs.

Two-sided conditions

Howard Dean has proposed allowing Americans to import prescription drugs from Canada. In a press release, he claims that Canadian drugs are safe and cheaper than U.S. drugs, but Bush administration officials have {issued an opposing press release which claims / testified before Congress} that we can't be sure imported drugs are safe.

Issue opinion (including controls)

Now I'm going to ask you what you think about this issue. Do you agree or disagree that Americans should be allowed to import prescription drugs from Canada? Do you strongly agree/disagree or only somewhat {agree/disagree}?

Medical malpractice lawsuit limitations

{First / Next}, I'm going to {tell / ask} you about the issue of medical malpractice lawsuits.

One-sided conditions

Some Republicans have proposed limiting the amount of money that juries can award in medical malpractice lawsuits. {In a press release, they claim / They have testified before Congress} that bogus lawsuits are driving up the cost of health care.

Two-sided conditions

Some Republicans have proposed limiting the amount of money that juries can award in medical malpractice lawsuits. In a press release, they claim that bogus lawsuits are driving up the cost of health care, but experts from the non-partisan Congressional Budget Office have issued an opposing press release which claims / have testified before Congress that malpractice lawsuits do not have a significant effect on health care costs.

Issue opinion (including controls)

Now I'm going to ask you what you think about this issue. Do you agree or disagree that the amount of money that juries can award in medical malpractice lawsuits should be limited? Do you strongly {agree/disagree} or only somewhat {agree/disagree}?

US withdrawal from Iraq

First / Next, I'm going to tell / ask you about the issue of the war in Iraq.

One-sided conditions

Some Democrats have proposed withdrawing all U.S. troops from Iraq by next year. {In a press release, they claim / They have testified before Congress} that the US presence is strengthening the insurgency.

Two-sided condition [invalidated]

Some Democrats have proposed withdrawing ALL U.S. troops from Iraq by next year. In a press release, they claim that the U.S. presence is strengthening the insurgency, but an expert from the

non-partisan Brookings Institution has issued an opposing press release which claims that pulling US troops out so fast would endanger the new Iraqi government.

Issue opinion (including controls)

Now I'm going to ask you what you think about this issue. Do you agree or disagree that all U.S. troops should be withdrawn from Iraq by next year? Do you strongly {agree/disagree} or only somewhat {agree/disagree}?

Appendix C: Study 2 wording

[Statements in brackets were varied by treatment condition. Controls did not receive the issue prompts.]

Our next questions focus on some issues being discussed in Washington D.C. these days.

Air traffic control management

One important debate concerns how best to promote airline safety. One proposal is to allow private companies to manage air traffic control stations. The other is to have the federal government continue to manage air traffic control stations.

A safety expert who works for {a private company/the federal government} {said that the government/testified under oath that the government} {should remain in charge of/should allow private companies to manage} air traffic control.

Looking ahead to one year from now, who do you think will be managing air traffic control—private companies, OR the federal government?

Medicare premiums

There is also a debate in Washington D.C. about the future of Medicare. One proposal is to increase premiums paid by Medicare recipients. Another proposal is to leave premiums as they are, which will increase future budget deficits.

{A spokesman for an anti-tax group/A current Medicare recipient} {said that the government/testified under oath that the government} {should raise Medicare premiums/should leave things as they are}.

Looking ahead to one year from now, what do you think will happen? Will the government raise Medicare premiums, OR leave things as they are?

Side-impact air bag regulation

There is another debate in Washington D.C. about side-impact air bags in cars. One proposal is to let car makers decide for them-

selves whether or not to install side-impact air bags. The other is to force car makers to install them.

A safety expert who works for the auto industry {said/testified under oath} that the government should {let car makers decide whether or not/force car makers/to install side-impact air bags}.

Looking ahead to one year from now, what do you think will happen? Will the government let car makers decide whether or not to install side-impact air bags, OR will the government force car makers to install them (side-impact air bags)? [As needed: Side-impact air bags are air bags that open when a car is hit from the side.]

Appendix D: Study 3 wording

[Statements in brackets were varied by treatment condition. Controls did not receive the issue prompts. For all agree/disagree questions below, subjects recorded their answers on a Likert scale ranging from strongly agree to strongly disagree.]

Outsourcing

Please read the passage below and then answer the following questions.

> Currently, there are no restrictions on the outsourcing of contract work being performed for the federal government. Some people want to prohibit federal contract work from being outsourced overseas, arguing that corporations receiving government funds should have to use American workers.
>
> An economist who studies international trade recently {testified under oath in court/testified under oath before Congress} that outsourcing is a net benefit to the national economy and that the restriction would drive up costs for the government.

Please state whether you agree or disagree with the following statements.

1. Prohibiting the outsourcing of federal contract work would hurt the economy and drive up costs for the government.
2. Five years from now, the government WILL prohibit the outsourcing of federal contract work.
3. The government SHOULD prohibit the outsourcing of federal contract work.

Side-impact air bags

Please read the passage below and then answer the following questions.

> Currently, automakers decide whether or not to install side-impact air bags in their cars. Some people want to require car makers to install side-impact air bags in all their cars, arguing that they provide necessary protection to vulnerable passengers.
>
> {Speaking to the press/Speaking at a Congressional hearing}, an independent expert on auto safety recently {said/testified under oath} that side-impact air bags significantly reduce deaths in auto accidents.

Please state whether you agree or disagree with the following statements.

1. Requiring the installation of side-impact air bags in all new cars would significantly reduce deaths in auto accidents.
2. Five years from now, side-impact air bags WILL be required in all new cars.
3. Car makers SHOULD be required to install side-impact air bags in all new cars.

Air traffic control

Please read the passage below and then answer the following questions.

> Currently, the federal government manages most air traffic control towers. Some people want to allow private companies to manage more air traffic control towers, arguing that government management is ineffective and inefficient.
>
> {Speaking to the press/Speaking at a Congressional hearing}, an independent air safety expert recently {said/testified under oath} that privately managed air traffic control towers cost less than equivalent government-managed towers and have an equally good safety record.

Please state whether you agree or disagree with the following statements.

1. Private management of air traffic control towers costs less than government management and does not compromise safety.
2. Five years from now, private companies WILL be managing more air traffic control stations than they currently do.
3. More air traffic control stations SHOULD be managed by private companies.

Social Security

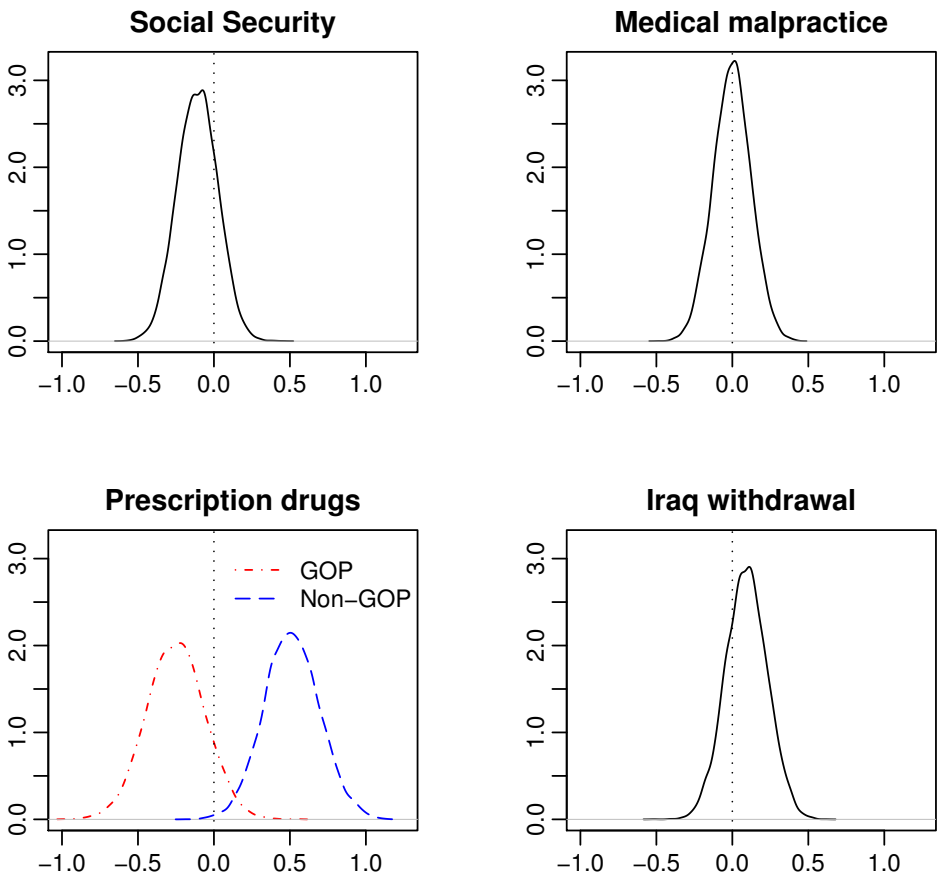
Please read the passage below and then answer the following questions.

> Currently, Social Security offers a fixed retirement benefit that is calculated based on your lifetime earnings. Some people want to allow younger workers to invest a portion of their Social Security taxes in stocks and bonds, arguing that private accounts would offer a higher rate of return than the current system.
>
> {Speaking to the press/Speaking at a Congressional hearing}, a non-partisan budgetary expert recently {said/testified under oath} that the only way to pay for private accounts is with deep benefit cuts in the future.

Please state whether you agree or disagree with the following statements.

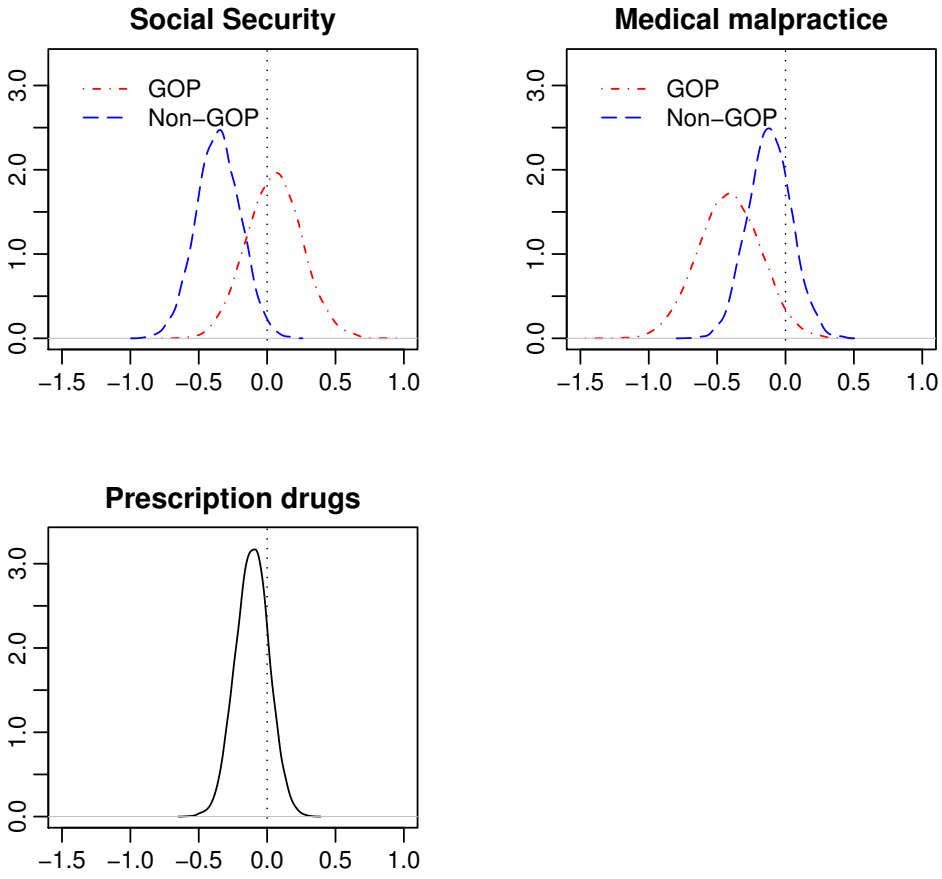
1. Creating private accounts in Social Security will force large cuts in benefits in the future.
2. Five years from now, private accounts WILL be available in Social Security.
3. Private accounts SHOULD be made available in Social Security.

Figure 1: Treatment effects—One frame, policy opinion (Study 1)



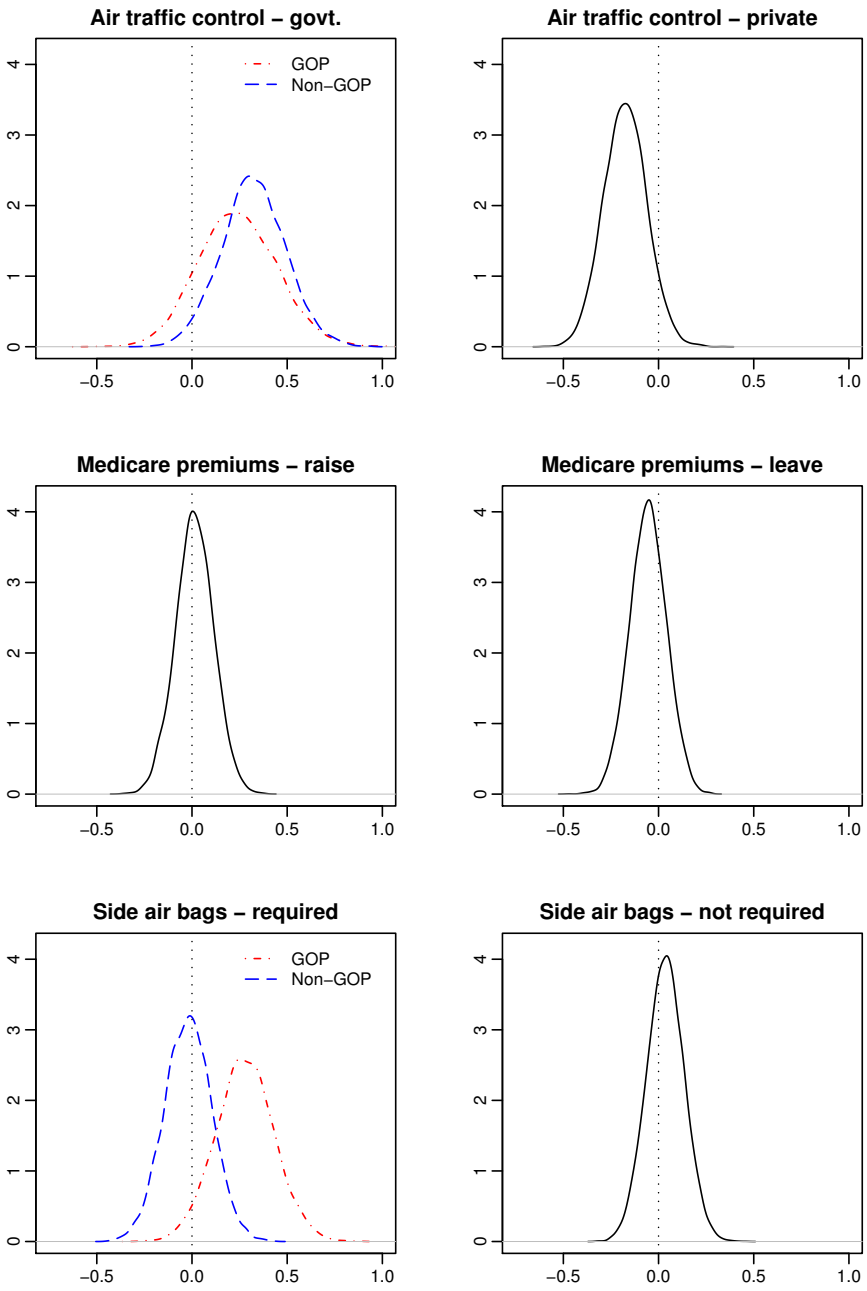
Plots represent posterior distributions for the treatment effect of Congressional testimony on subjects' policy opinions. Positive values indicate increased support for the policy in question. Densities are plotted separately for Republicans and non-Republicans when the 90% highest posterior density region includes zero for only one group. See Table A1 for estimation results.

Figure 2: Treatment effects—Two frames, policy opinion (Study 1)



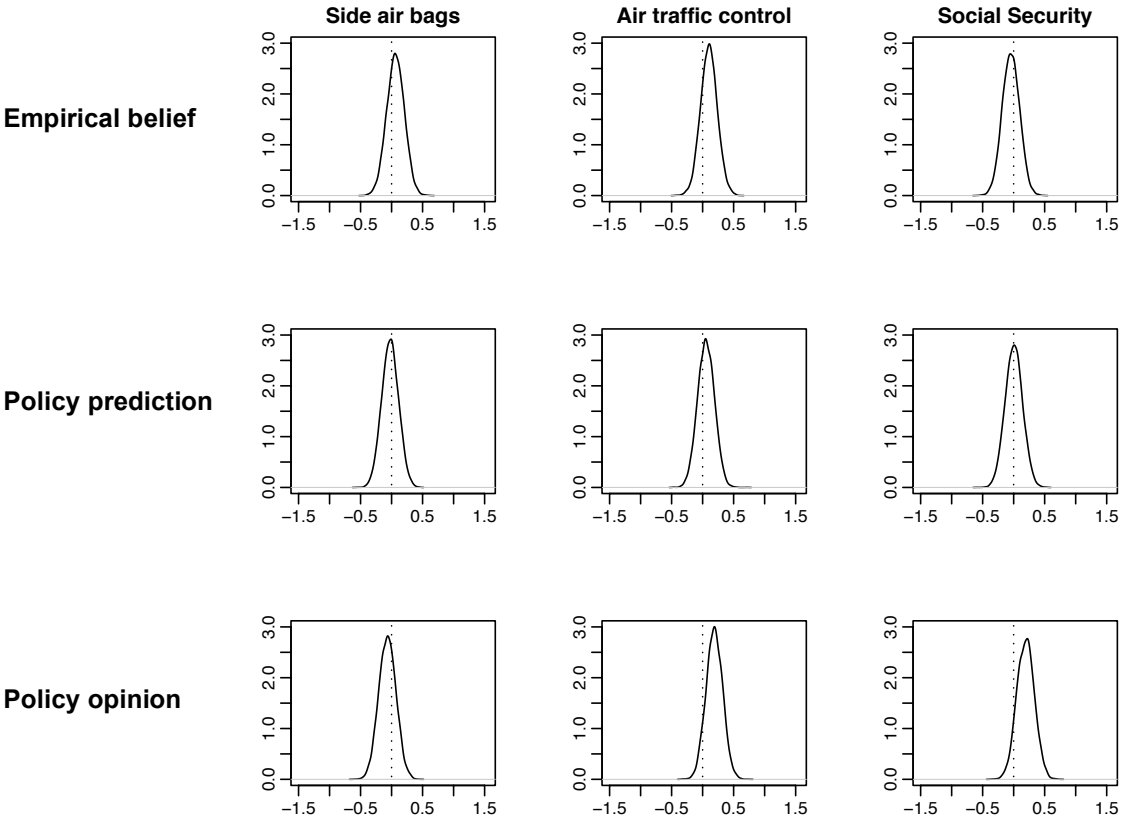
Plots represent posterior distributions from ordered probit models for Congressional testimony treatment effect on subjects' policy opinions. Positive values indicate increased support for the policy in question. Densities are plotted separately for Republicans and non-Republicans when the 90% highest posterior density region includes zero for only one group. See Table A1 for estimation results.

Figure 3: Treatment effects—One frame, policy prediction (Study 2)



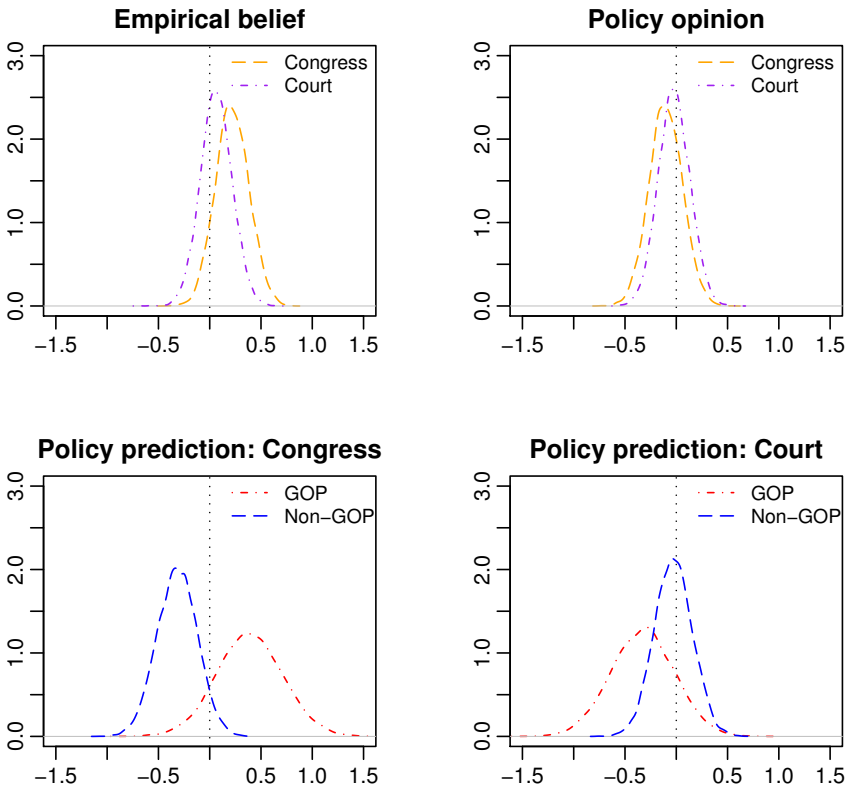
Plots represent posterior distributions from probit models for court testimony treatment effect on subjects' predictions of future policy outcomes. Positive values indicate an increased likelihood of choosing the most likely future outcome. Densities are plotted separately for Republicans and non-Republicans when the 90% highest posterior density region includes zero for only one group. See Table A2 for estimation results.

Figure 4: Treatment effects—One frame (Study 3)



Plots represent posterior distributions of the testimony treatment effect from ordered probit models. The dependent variables are participants' empirical beliefs, predicted policy outcomes, and policy opinions for the issues of air traffic control, side-impact air bag regulation, and Social Security private accounts. See Table A3 for estimation results.

Figure 5: Treatment effects—One frame (Study 3)

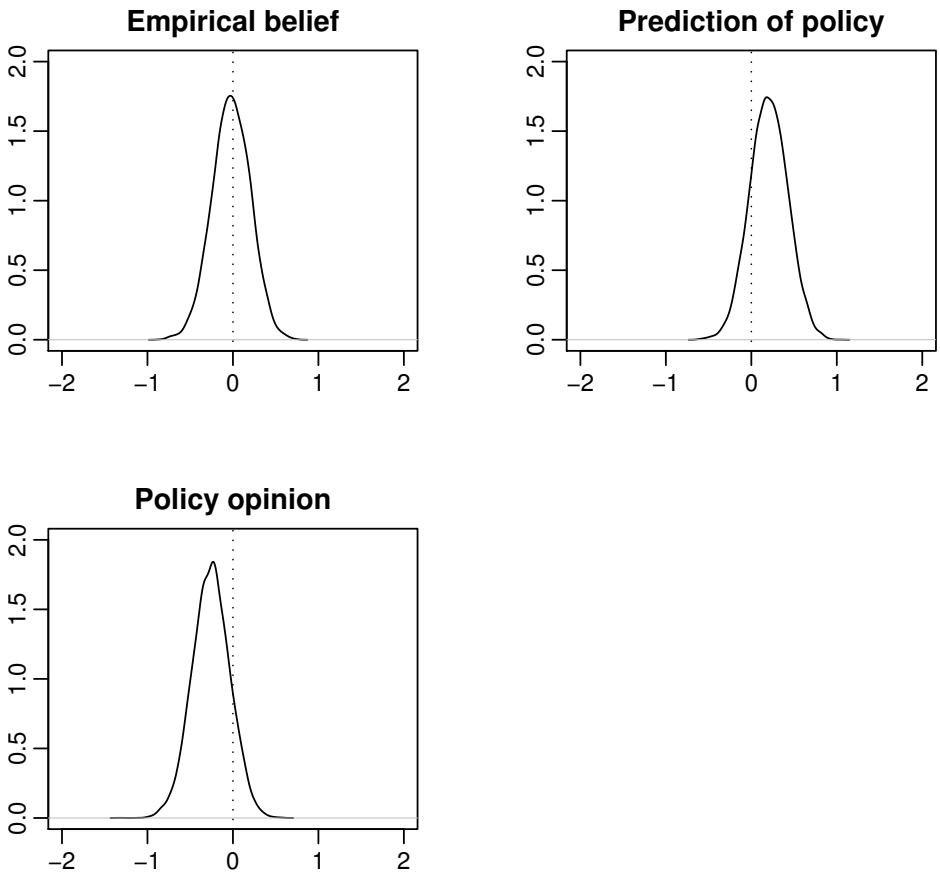


Plots represent posterior distributions from ordered probit models for the treatment effect of testimony in court and in Congress relative to controls on the issue of outsourcing. Densities are plotted separately for Republicans and non-Republicans when the 90% highest posterior density region includes zero for only one group. See Table A4 for estimation results.

Figure 6: Visual manipulation from Study 4

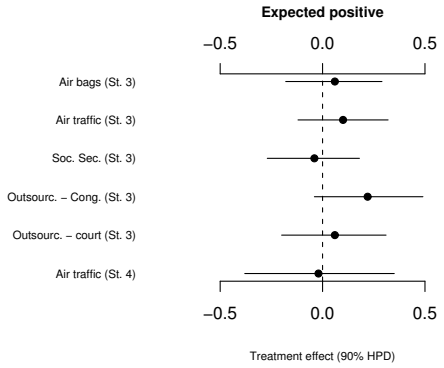
While reading the prompt from the air traffic control experiment in Appendix D, subjects in the non-testimony condition saw an image of a man speaking at a press conference (the picture in the top portion of the figure), while those in the testimony condition viewed an image of a man with his arm raised taking an oath at a hearing (the picture on the bottom portion of the figure).

Figure 7: Treatment effects—One frame, visual cue (Study 4)

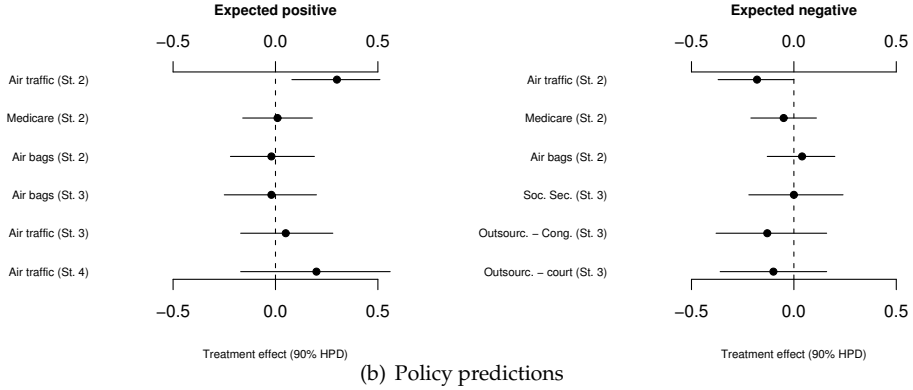


Plots represent posterior distributions from ordered probit models for visual testimony treatment effect on three dependent variables—empirical beliefs, predicted policy outcome, and policy opinion—for the issue of air traffic control management. See Table A5 for estimation results.

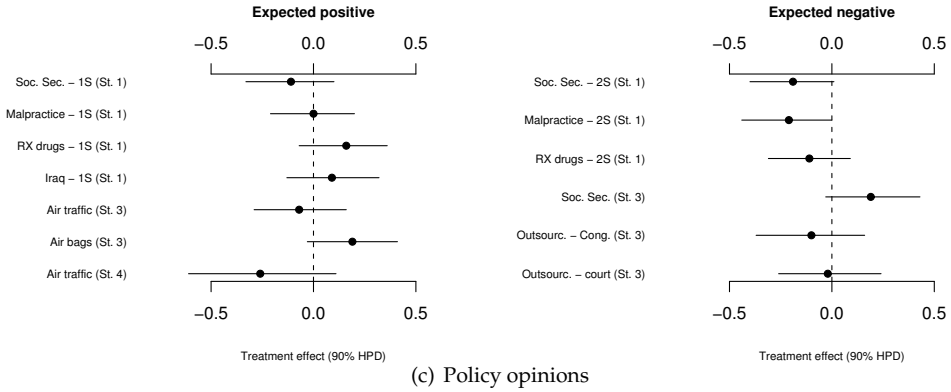
Figure 8: Testimony treatment effects



(a) Empirical beliefs



(b) Policy predictions



(c) Policy opinions

Plots represent 90% HPD regions from probit and ordered probit models of the experiments presented above. "1S"=one-sided; "2S"=two-sided. See Appendix A for estimation details.

Table 1: Experimental overview

		Design											Dependent variables		
	Issue	Salient	Frames	Claim	Attributed	Expert	Oath	Contrast	Venue	Visual	Sample	Mode	Belief	Prediction	Opinion
Study 1	Social Security	X	1	Positive empirical				Release	Cong.		Natl.	Phone			X
	Medicare	X	1	Positive empirical	X			Release	Cong.		Natl.	Phone			X
	RX drugs	X	1	Positive empirical	X			Release	Cong.		Natl.	Phone			X
	Iraq	X	1	Positive empirical	X			Release	Cong.		Natl.	Phone			X
	Social Security	X	2	Negative empirical	X			Release	Cong.		Natl.	Phone			X
	Medicare	X	2	Negative empirical	X	X		Release	Cong.		Natl.	Phone			X
	RX drugs	X	2	Negative empirical	X			Release	Cong.		Natl.	Phone			X
Study 2	Air traffic		1	Positive prediction		X	X	Said	Court		Natl.	Phone		X	
	Medicare	X	1	Positive prediction			X	Said	Court		Natl.	Phone		X	
	Air bags		1	Positive prediction		X	X	Said	Court		Natl.	Phone		X	
	Air traffic		1	Negative prediction		X	X	Said	Court		Natl.	Phone		X	
	Medicare	X	1	Negative prediction			X	Said	Court		Natl.	Phone		X	
	Air bags		1	Negative prediction		X	X	Said	Court		Natl.	Phone		X	
Study 3	Air bags		1	Positive empirical		X	X	Press	Cong.		Stud.	Comp.	X	X	X
	Air traffic		1	Positive empirical		X	X	Press	Cong.		Stud.	Comp.	X	X	X
	Social Security	X	1	Negative empirical		X	X	Press	Cong.		Stud.	Comp.	X	X	X
	Outsourcing	X	1	Positive empirical		X	X	Court	Cong.		Stud.	Comp.	X	X	X
	Outsourcing	X	1	Positive empirical		X	X	Cong.	Court		Stud.	Comp.	X	X	X
Study 4	Air traffic		1	Positive empirical		X	X	Press	Cong.	X	Stud.	Comp.	X	X	X

"Salient" indicates that the issue was highly salient.
"Attributed" indicates that the proposal was attributed to a prominent political figure or party.
"Expert" indicates that the speaker who is testifying (or not) is described as an expert.
"Oath" indicates that the speaker is explicitly described as testifying "under oath" in the testimony condition.
"Contrast" indicates the contrasting condition to the testimony manipulation.
"Venue" indicates the institutional context for the testimony manipulation; "Cong." indicates that the context was testimony before Congress.
"Release" indicates a press release; "said" indicates a general statement in an undefined context; and "press" indicates a statement made to the press.
"Stud." indicates that a student or student/community sample was used.

Table 2: Mean opinion by cell in Study 1

	Social Security	Malpractice	RX drugs	Iraq withdrawal
Control group	2.88 (1.22)	3.13 (1.10)	3.33 (1.00)	2.67 (1.33)
One-sided frame	2.57 (1.22)	3.14 (1.12)	3.00 (1.12)	2.60 (1.22)
One-sided, testimony	2.58 (1.27)	2.98 (1.16)	3.25 (1.04)	2.61 (1.33)
Two frames	2.65 (1.20)	2.96 (1.21)	3.02 (1.08)	2.39 (1.24)
Two frames, testimony	2.48 (1.23)	2.78 (1.24)	3.07 (1.11)	—

Responses measured on a 1-4 Likert scale; $n = 514$. Due to a typographical error, the two-sided testimony condition for US withdrawal from Iraq was invalidated.