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ABSTRACT

Partisanship seems to affect factual beliefs about politics. For example, Republicans are more likely than Democrats to say that the deficit rose during the Clinton administration; Democrats are more likely to say that inflation rose under Reagan. We investigate whether such patterns reflect differing beliefs among partisans or instead reflect a desire to praise one party or criticize another. We develop a model of partisan survey response and report two experiments that are based on the model. The experiments show that small payments for correct and "don't know" responses sharply diminish the gap between Democrats and Republicans in responses to "partisan" factual questions. The results suggest that the apparent differences in factual beliefs between members of different parties may be more illusory than real.

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A persistent pattern in American public opinion is the presence of large differences between Democrats and Republicans in stated attitudes about factual matters. For example, in 2010, Harris Interactive surveyed U.S. adults to determine their beliefs about whether Barack Obama was born in the United States. Forty-five percent of Republicans stated that he was born abroad, compared to only eight percent of Democrats (Harris Interactive 2010). This partisan divide appears in many other surveys and on other topics, e.g., whether weapons of mass destruction had been found in Iraq (Harris Interactive 2006; see also Duelfer 2004). Partisan divisions would be expected for questions about political attitudes or tastes, but they extend even to evaluations of economic trends during a president's tenure (Bartels 2002, 133-38).

Systematic partisan differences in responses to factual questions about politics are not mere curiosities. Some of the strongest defenses of democracy rest on theories of retrospective voting: even if voters know little, these theories maintain, they can administer "rough justice" by rewarding or punishing incumbents for things that have happened during their terms (Fiorina 1981, 4). But partisan differences in responses to factual questions call into question voters' abilities to vote retrospectively (see also Healy and Malhotra 2009). And partisan bias in voters' memories of incumbent performance may give incumbents weaker incentives to seek true improvements in voter welfare.

More generally, both recent and classic research supports the notion that partisanship has a powerful influence on attitudes and behaviors (e.g., Gerber, Huber, Washington 2010; Campbell et al. 1960). In light of this tradition, it is not surprising that scholars often take survey respondents' statements of beliefs at face value (e.g., Bartels 2002; Shapiro and Bloch-Elkon 2008; Jerit and Barabas 2012). If partisanship is a "perceptual screen," partisan differences in factual beliefs are a natural consequence of the influence of partisanship on information acquisition and processing. This paper, however, considers a distinct alternative: partisan differences in survey responses may not solely indicate differences in true beliefs. Instead, they may also reflect the expressive value of offering survey responses that portray one's party in a favorable light. A partisan pattern of survey response follows when this expressive value outweighs the utility that survey respondents would receive from stating their sincere beliefs. Partisan

divergence may therefore reflect the joy of partisan "cheerleading" rather than sincere differences in beliefs about the truth. Despite the reality that survey respondents have limited incentives to respond accurately to survey questions, almost no research has attempted to determine the extent to which partisan divergence in responses to factual questions with partisan implications reflects sincere beliefs.

This paper reports results from two novel experiments designed to distinguish sincere from expressive partisan differences in responses to factual questions. In both experiments, all subjects were asked factual questions, but some were given financial incentives to answer correctly. In both experiments, we find that the incentives reduce partisan divergence substantially—on average, by about 55% and 60% across all of the questions for which partisan gaps appear when subjects are not incentivized. But offering an incentive for accurate responses will not deter cheerleading among those who are unsure of the correct factual response, because such people stand to gain little by forgoing it. In our second experiment, we therefore implement a treatment in which subjects were offered incentives both for correct responses and for admitting that they did not know the correct response. We find that partisan gaps are even smaller in this condition—about 80% smaller than for unincentivized responses. This finding suggests that partisan divergence is driven by both expressive behavior and by respondents' knowledge that they do not actually know the correct answers.

These results have important implications for our understanding of public opinion. Most importantly, they call into question the claim that partisan divergence in beliefs about factual questions is ground for concern about voters' abilities to hold incumbents accountable for their performance. Partisans may disagree in surveys, but we should not take these differences at face value.[1]

These results may also affect our understanding of partisan polarization in the mass electorate. At least in the realm of factual evaluations, partisan differences exist, but our results suggest that they are not as large as naïve analysis of survey data suggests. Just as people enjoy rooting for their favorite sports team and arguing that their team's players are superior, even when they are not, surveys give citizens an

[1] These results also have implications for the literature on economic voting, because our results confirm concerns (e.g., Ansolabehere, Meredith, and Snowberg 2013) that survey reports of economic conditions may be contaminated by expressive partisan responding.

opportunity to cheer for their partisan team (Green, Palmquist, and Schickler 2002). Deep down, however, individuals understand the true merits of different teams and players—or, at the minimum, they understand that they don't know enough to support their expressive responding as correct.

Our work also has important methodological implications. In particular, how should one interpret experiments that show partisan cues increase partisan divisions in survey response? Such results are commonly taken to show that partisanship affects attitudes. Our results suggest, however, that partisan cues may merely remind participants about the expressive utility that they gain from offering partisan-friendly survey responses. A key task for researchers is thus to understand when survey responses reflect real attitudes and when they reflect these more expressive tendencies. Such an understanding is essential if survey attitudes are used to explain vote choices or other salient political outcomes, a topic we take up in the conclusion.

The remainder of this paper proceeds as follows. We begin by reviewing prior theory and evidence about partisan response patterns in answers to factual questions. We then present a model of survey response that incorporates the possibility of expressive benefits to offering partisan responses. This model informs the design of our two experiments, which we present in the next sections. The final section considers the implications of our results and avenues for future research.

THEORY AND PRIOR EVIDENCE

Prior research documents partisan differences in expressed factual beliefs (e.g., Jerit and Barabas 2012; Gaines et al. 2007; Jacobson 2006), and some of it focuses on differences in evaluations of retrospective economic conditions (e.g., Conover, Feldman, and Knight 1986, 1987; Bartels 2002, 133-38).[2] Many of these partisan gaps arise because members of one party issue retrospective economic assessments that deviate starkly from objective conditions. For example, despite the large improvement in unemployment and inflation during Ronald Reagan's presidency, Bartels (2002) shows that, in 1988, Democrats were more likely than Republicans to incorrectly report that unemployment and inflation had increased since

[2] A related but distinct literature concerns partisan differences in responses to non-factual questions (e.g., is the president evil?) or to questions whose answers are not readily observable (see, e.g., Berinsky 2012).

1980. This pattern was reversed in 2000, at the end of the Clinton presidency, when Republicans were more likely to offer negative retrospective evaluations.[3]

The key question is how to interpret these partisan gaps. Bartels presents the common view when he argues that partisans likely believe their divergent assessments: "Absent some complicated just-so story involving stark differences in the meaning of 'unemployment' and inflation…among Democrats and Republicans, these large differences can only be interpreted as evidence of partisan biases in perceptions" (Bartels 2002, 136-37). An alternative view is that differences in survey responses are the result of a combination of motivations. Individuals may express responses consistent with their partisanship not because they believe those responses, but because doing so gives them opportunity to support their "team" (e.g., Gerber and Huber 2010; Green, Schickler, and Palmquist 2002).

Of course, many social scientists have wrestled with the problem of insincere survey responses (e.g., Berinsky 2005; Kuklinski, Cobb, and Gilens 1997; Noelle-Neumann 1993). But they typically focus on responses to sensitive topics (e.g., race) rather than on problems that may be caused by "expressive benefits" in survey response.[4] And the methods used to overcome problems associated with responses to sensitive topics—for example, "list experiments" (Kuklinski, Cobb, and Gilens 1997)—may not apply to the problem of eliciting sincere responses when people derive expressive benefits from answering insincerely.

Instead, researchers have long turned to incentives to induce honest responses or rational behavior. In a review of experiments involving incentives, Morton and Williams (2010, 358-61) argue that incentives often reduce the size and frequency of decision-making errors. But almost all of the studies that they review are apolitical and do not involve tests of factual knowledge. Prior and Lupia (2008) do

[3] Additional work examines conditions that can exacerbate apparent partisan gaps. Asking political questions prior to economic ones increases the correlation between partisanship and subjective economic evaluations (Lau, Sears, and Jessor 1990; Palmer and Duch 2001; Sears and Lau 1983; Wilcox and Wlezien 1993), and partisan gaps are larger when elections are more salient (Lavine, Johnston, and Steenbergen 2012, ch. 4; see also Stroud 2008). What is unclear in this work, however, is how to interpret these patterns. Do circumstances that make partisanship more salient provide factual information to survey respondents or do they simply increase the expressive value of partisan responses?

[4] An exception to this characterization is the literature on economic voting discussed above.

study the effects of financial incentives on responses to factual questions about politics, and they find that the effects of offering incentives are real but weak.[5] However, they do not examine the effects of incentives on partisan patterns in responding.

To date, only one study has examined the effects of incentives on partisan response patterns to factual questions about politics: Prior (2007). Subjects in the study were asked 14 questions about politics; some were assigned at random to receive $1 for each correct answer. The results were mixed, but they suggest that $1 incentives can reduce party differences in responses to such questions.[6] One unanswered question in that work, however, is how respondents who do not know the correct answers should be expected to behave in the presence and absence of incentives. It may be, for example, that partisan responses are insincere, but that respondents continue to offer them when given incentives to provide a correct response because they do not know what other answer might be correct.

To address these questions, we present a model of survey response that incorporates the possibility that individuals (a) receive utility from offering partisan-tinged responses and (b) differ in their underlying knowledge of the truth. We use this model to understand the effect of incentives on a respondent's tendency to answer questions in a manner that reflects either her partisan affinity or her sincere beliefs about the truth. We also show that our model can be used to understand the proportion of partisan differences that arise because individuals are uncertain about the truth.

A THEORY OF EXPRESSIVE SURVEY RESPONSE

To understand the role that expressive survey response plays in the partisan polarization of survey responses, and to motivate our experimental design, we present a model of survey response in the presence and absence of financial incentives. Our objective is to provide intuitions about how sincere

[5] All subjects in the Prior and Lupia (2008) study were asked 14 factual questions about politics. Subjects in a control condition averaged 4.5 correct answers, while those who were paid $1 for each correct answer averaged 5.0 correct answers (Prior and Lupia 2008, 175).

[6] Incentives reduced partisan gaps in responses to four items. Results on a fifth item were mixed. Results were null for two other items. There was no partisan gap in the control group for three further items, and results for the remaining four items were not reported.

differences in beliefs about the truth, the expressive value of partisan responding, and incentives may interact to shape polarization in survey responses. The model allows us to clarify expectations about our experimental findings. As in our experimental design, financial incentives in the model take two forms: Respondents may be paid for offering a correct response or for admitting that they "don't know" the correct answer.

We begin by focusing on incentives for a correct response. Our model shows that incentives allow us to assess the degree to which partisan divergence arises because people simultaneously (1) understand that they would otherwise provide inaccurate partisan responses, (2) give low value to this "cheerleading" relative to the size of the offered incentive, *and* (3) maintain strong beliefs about the correct answer that are common to members of both parties. Under these conditions, a surveyor can reduce partisan divergence by offering incentives for correct responses.

A consequential aspect of our models is the third condition: a shared bipartisan belief about the truth. Holding all else constant, if members of different parties have different beliefs about the truth, then financial incentives will not cause their survey responses to converge. This, of course, is what most existing research assumes is true: that partisan differences in factual beliefs are sincere. Alternatively, however, competing partisans may not differ in their beliefs about the truth, but they may still be uncertain enough about the truth that a reward will not cause them to deviate from their partisan-tinged response. Put another way, if I'm being paid for a correct response but I believe that my preferred partisan response is as likely to be correct as any other (i.e., I am completely uniformed), then my expected utility is maximized by continuing to offer the response that gives me the most expressive partisan utility.

In light of this ambiguity, we extend the model by incorporating incentives for admitting one's lack of knowledge. When respondents are offered incentives for both correct and "don't know" answers, our analysis shows that the proportion of respondents choosing "don't know" is increasing in the proportion of respondents who (1) give low value to partisan cheerleading relative to the size of the incentive for choosing "don't know," *and* (2) have sufficiently weak beliefs about the truth that they are better off choosing "don't know" than any other option. Overall, incentives for "don't know" responses

allow us to estimate the proportion of partisan divergence that arises because respondents know that they don't know the truth and instead offer expressive partisan responses in the absence of incentives for choosing "don't know."

Basic Model

We begin with a model in which respondents derive utility from their survey responses in three ways: by offering answers that cast their party in a favorable light, by expressing their sincere beliefs, and by earning financial rewards. For now, we set aside the possibility that people can choose to say "don't know." For simplicity, we focus on the case in which there are two survey responses, r_1 and r_2. Individuals, indexed by the subscript i, are either Democrats (T = D) or Republicans (T = R). Individuals differ in their taste for partisan cheerleading and their beliefs about the truth.

Turning first to expressive benefits, individual *i*'s taste for partisan cheerleading is denoted by the parameter c_i, for cheerleading, which ranges from 0 (no taste for it) to any positive number. Beliefs about the truth are described by the function $p_i(r_j)$, which is the probability that i believes response r_j, j = 1 or 2, is correct. In this example, we assume that response r_1 portrays Democrats most favorably, that response r_2 portrays Republicans most favorably, and that these assumptions are shared by respondents from both parties. Specifically, the expressive function $e(T, r_j)$ maps an individual's partisanship T to the personal benefit of offering response r_j, and is defined as $e(T = D, r_1) = e(T = R, r_2) = 1$ and $e(T = D, r_2) = e(T = R, r_1) = 0$. That is, Democrats and Republicans receive an expressive partisan utility boost from offering the response that portrays their party in a favorable light, and they receive no partisan utility from offering the response that is inconsistent with their partisan leanings.

The utility associated with providing a sincere response is measured by the "honesty" function $h_i(r_j)$. For simplicity, we assume $h_i(r_j) = p_i(r_j)$, i.e., the honesty value of offering response r_j is the probability that the respondent believes it is true. Finally, some respondents may also receive an incentive, I > 0, which is the additional reward for a correct response. We assume utility is linear in I.

These assumptions allow us to describe a respondent's expected utility for offering response r_j as the sum of three terms. We omit the individual subscript i for clarity:

(1) $EU(r_j|.) = h(r_j) + I \times p(r_j) + c \times e(T,r_j)$.

The first term is simply the honesty value of response r_j. The second term is the additional value of providing response j in the presence of incentive I (realized with the probability that response is correct). The third term is the partisan value of offering response r_j weighted by the respondent's value of expressive partisan responding, c. Using the assumption that h() is equivalent to p(), we rewrite (1) as:

(2) $EU(r_j|.) = (1+I) \times p(r_j) + c \times e(T,r_j)$,

which is the form of the expected utility we focus on here. A respondent will offer the response r_j from (r_1,r_2) that maximizes (2).

To make the exposition as clear as possible, we suppose that the respondent is a Democrat (T = D). The analysis for the Republican partisan mirrors that for the Democratic partisan and is omitted. Recall that r_1 is the partisan Democratic response, and so $e(D, r_1) = 1$ and $e(D, r_2) = 0$.

First, consider how our model predicts that partisans will respond to a survey in the absence of incentives for correct responses. In this case, equation (2) reduces to

(3) $EU(r_j|.) = p(r_j) + c \times e(T,r_j)$.

Using (3), the utility from reporting response r_1 is $p(r_1) + c$, and the utility from reporting r_2 is $p(r_2) = 1 - p(r_1)$. Therefore the Democrat will report r_1 whenever $c \geq c^* = 1 - 2p(r_1)$.

As c is weakly positive, whenever $p(r_1) > .5$ (that is, the Democrat believes response r_1 is at least as likely to be correct as r_2), the Democrat will offer the partisan response r_1 even in the absence of expressive returns (i.e., even if c = 0). By contrast, as $p(r_1)$ grows small (i.e., as the Democrat becomes increasingly likely to believe the pro-Republican response is correct), larger values of c are required to cause her to offer r_1. To produce a response of r_1, the partisan expressive return must be larger to offset the greater cost of providing an answer that is likely to be untrue.

This relationship is displayed graphically in Panel A of Figure 1, which shows that for each value of $p(r_1)$ there is a value of expressive partisan responding such that, for those Democrats with c at least this large, r_1 will be their survey response. Democrats offering r_1 are therefore composed of two groups. The first group consists of those who believe that r_1 is more likely to be correct than r_2; this group is

represented by the right-hand side of the panel, for which $p(r_1) > .5$. The second group consists of those who believe that r_2 is more likely to be correct, but for whom that belief is offset by a larger return from offering an expressive partisan response. This group is represented by the upper segment of the left-hand side of the panel, which is labeled "insincere choice of r_1."

To link expressive returns to polarization of partisan responses, consider Panels B and C. Panel B shows the response pattern for Republicans, which is a mirror image of Panel A. And Panel C displays both partisan response patterns at once. It shows that in the presence of expressive returns, Democrats and Republicans *who share common beliefs about the truth* (are at the same position on the horizontal axis) *can nonetheless offer polarized survey responses if their value of expressive partisan responding is large enough*. When beliefs about the truth are shared, polarization is most prevalent when beliefs are most uncertain, i.e., when $p(r_1) = p(r_2) = .5$. Polarization will also arise, even in the absence of returns to expressive partisan responding (i.e., when $c = 0$), if Democrats and Republicans hold different beliefs about the truth.

We next consider what happens when incentives are offered for correct responses, i.e., when $I > 0$. From equation (2), for a given value of I, there is a unique $c^{*\prime} = (1+I)(1 - 2p(r_1))$ such that all Democrats with an expressive responding parameter greater than $c^{*\prime}$ will offer r_1. As before, incentives have no effect on the responses of Democrats who believe that response r_1 is correct (i.e., $p(r_1) > .5$). But for Democrats who believe response r_2 is more likely to be correct, a larger return to cheerleading is now required to offset the earnings that are likely to be lost by offering response r_1. Formally, $c^{*\prime} = c^* + (I \times (1 - 2p(r_1))$. This relationship is shown in Panel A of Figure 2. (For simplicity, we assume throughout Figure 2 that $I = 1$.)

Comparison of Panel A in Figure 1 and Panel A in Figure 2 draws out a basic but important result: incentives for correct responses reduce expressive partisan responding by causing some of those who know that response r_1 is less likely to be true to offer response r_2 instead. In Figure 2, these respondents are represented by the region that is labeled "induced choice of r_2."

Figure 2 draws out a second important result: when a Democrat believes that r_2 is more likely to

be correct, the additional value of expressive returns (c) that is required to make her offer response r_1 increases in her belief that r_2 is correct. Formally, $c^{*'} - c^*$ is increasing in $p(r_2)$. To see this result graphically, note that the vertical gap between the dashed and solid lines increases as one approaches the left side of the x-axis. This gap increases because the difference between $c^{*'}$ and c^* is a function of $p(r_1)$. In other words, for those who are more uncertain ($p(r_1)$ is closer to .5), incentives have smaller effects. At the extreme, an individual who believes that r_1 and r_2 are equally likely to be true—that is, she knows that she doesn't know the truth—continues to offer r_1 regardless of incentives for correct responses because she won't (in expectation) do better by giving up the certain benefit of a partisan response.

To illustrate the effect of incentives on polarization, Panel B of Figure 2 shows the effect of incentives for Republican partisans, and Panel C displays both partisan response patterns at once. Comparison of Panel C in Figure 1 to Panel C in Figure 2 shows that increasing incentives decreases polarization. In particular, incentives reduce the frequency with which Democrats and Republicans who share common beliefs about the truth offer different survey responses, apart from the case in which $p(r_1) = p(r_2) = .5$.

This exposition leads us to two conclusions. First, incentives for correct answers reduce partisan divergence in the presence of shared beliefs about the truth. Second, partisan divergence may persist in the face of incentives. It is clear that if partisan groups have different sincere beliefs about which response is most likely to be true, paying respondents for correct responses will not reduce polarization. However, although it may seem intuitive that persistent partisan divergence in the presence of incentives for correct responses *implies* underlying differences in beliefs about the truth, our analysis suggests partisan divergence may nonetheless persist for two other reasons. First, the taste for expressive partisan cheerleading (c) may be large. Second, even if that taste is small, individuals may be uncertain about the truth. In that case, they will offer partisan responses even in the face of large incentives for correct responding.

We have considered respondents who must provide either a partisan-consistent or a partisan-inconsistent response. But giving respondents the option to decline to provide a response may reduce

observed polarization. To explore this possibility, we consider a model with an additional response option: "don't know."

Incorporating "Don't Know" Responses

To incorporate a "don't know" response option, we must specify the utility that a respondent receives from selecting "don't know." For simplicity, we assume that a "don't know" response (r_{dk}) yields some fixed positive psychological benefit $V_{dk} > 0$ plus whatever financial incentive is offered for giving that response (I_{dk}). Specified this way, $U(r_{dk}) = V_{dk} + I_{dk}$. One can think of V_{dk} as the honesty value of choosing "don't know" relative to an incorrect response. As before, the individual is offered an incentive I for providing a correct response.

When will a respondent choose "don't know"? Note that the value of "don't know" is unaffected by c or p(), so a respondent chooses "don't know" when the values of c and p() make both r_1 and r_2 less attractive than "don't know." Recall from the previous analysis (illustrated in Panel A of Figure 2) that a Democrat's selection of r_1 or r_2 depends on whether c is greater or less than $c^{*\prime} = (1+I)(1 - 2p(r_1))$.

Consider first a Democrat who would otherwise choose the "Republican" response, r_2. Her expected utility for choosing this response is $(1+I) \times (1 - p(r_1))$. This utility is greater than the utility associated with selecting "don't know" when $p(r_1) < p^*(r_1) = 1 - (V_{dk} + I_{dk}) / (1+I)$. This $p^*(r_1)$ is the lowest probability that the Democratic response (r_1) is correct for which the Democrat will select "don't know" rather than the Republican response. When $p(r_1)$ is below this critical value, the Democrat prefers to report the Republican response. Note that this critical value of $p^*(r_1)$ is unaffected by the expressive value of partisan responding c, because the return to r_2 is unaffected by c.

Figure 3 illustrates this logic. For presentation, we assume that I = 1, $I_{dk} = .75$, and $V_{dk} = .5$.[7] The value of $p^*(r_1)$ is thus $1 - (.5 + .75) / (1 + 1) = .375$. Graphically, this solution is represented in Panel A by the leftmost line that defines the "induced don't know" region. Substantively, the point is that when

[7] We choose a relatively high level of I_{dk} because Figure 3 illustrates the logic of our model when there are only two survey responses (in addition to "don't know"). Given only two responses, even complete uncertainty means that one is, in expectation, correct half of the time. In a model with more response options, the value of I_{dk} necessary to sustain don't know responses would be smaller.

$p(r_1)$ exceeds the critical value $p^*(r_1)$, all cases in which the Democrat would have offered the Republican response are replaced by "don't know" answers.

We next examine how a Democrat who otherwise would have chosen the "Democratic" response, r_1, behaves in the presence of incentives for "don't know." We have already shown that if $c = c^*$', the Democrat is indifferent between the Democratic and the Republican responses, and that if $p(r_1) = p^*(r_1)$, she is also indifferent between those responses and "don't know." However, as $p(r_1)$ rises above $p^*(r_1)$, the expected return from choosing the "Democratic" response increases. This means that as the Democratic response becomes more likely to be true, smaller returns to expressive responding are required to keep the Democratic response more attractive than "don't know." In Panel A of Figure 3, this condition is illustrated by the downward-sloping line that defines the top of the region labeled "induced don't know." Formally, $c = c^{*\prime\prime} = (V_{dk} + I_{dk}) / (p(r_1)(1+I))$ is the critical value, such that when $c > c^{*\prime\prime}$ (and $c > c^*$'), the Democrat chooses the Democratic response over "don't know."

Parallel analysis for Republicans appears in Panel B of Figure 3. For both Democrats and Republicans, the subjects who offer "don't know" responses are drawn from those who are most uncertain about which answer is correct, i.e., from subjects for whom $p(r_1)$ is close to .5. Our analysis above establishes that it is this uncertainty that makes incentives for correct answers least likely to affect survey responses. Accordingly, for these uncertain respondents, the "sure thing" of a "don't know" payment is a more effective inducement than the smaller probability of earning a potentially larger payment for a correct response.

Combining these analyses, as we do in Panel C, and comparing that plot to panel C of Figure 2 allows us to assess the effect on observed polarization of offering incentives for both correct and "don't know" responses. Relative to simply offering incentives for correct responses, adding incentives for "don't know" responses decreases the frequency with which Democrats and Republicans who share common beliefs about the correct response provide divergent (non-"don't know") survey responses.

We now describe the design of our two experiments. The first experiment focuses on differences in survey responses in the presence and absence of incentives for correct responses. The second

experiment also incorporates incentives for "don't know" responses.

EXPERIMENT 1: THE EFFECT OF FINANCIAL INCENTIVES FOR CORRECT RESPONSES ON PARTISAN DIVERGENCE

Our first experiment was fielded on the 2008 Cooperative Congressional Election Study, an Internet survey of U.S. citizens that was conducted by YouGov/Polimetrix in October 2008. YouGov/Polimetrix uses sampling and matching techniques to generate a sample that approximates the demographic composition of the adult U.S. population. (See Appendix A for further information about the construction of the 2008 CCES sample.) Six hundred and twenty-six participants were randomly assigned to the control group (N = 312) or the treatment group (N = 314).[8] We restrict our analysis to the 419 participants who identified as either Democrats or Republicans.[9]

We told control-group subjects that they would be asked questions about politics, that they would have 20 seconds to answer each question, and that their scores would not be shared with anyone. Treated subjects received the same instructions and were also told that answering correctly would increase their chance of winning a prize:

> For each question that you answer correctly, your name will be entered in a drawing for a $200 Amazon.com gift certificate. For example, if you answer 10 questions correctly you will be entered 10 times. The average chance of winning is about 1 in 100, but if you answer many questions correctly, your chance of winning will be much higher.

After receiving their instructions, all subjects were asked the twelve factual questions shown in Table 1. The first ten items had closed response options and were similar to questions for which other research has found partisan differences. No "don't know" option was offered. Each question included a reference to a salient partisan issue, e.g., the war in Afghanistan under a Republican president. The last two "placebo" questions required participants to enter numerical responses and were fielded to ascertain

[8] Of these 419 partisans, 81% were white, 7% were black, 8% were Hispanic and 54% were female. Their mean age was 48 years old, their median level of educational attainment was "some college," and 67% were married or in a domestic partnership

[9] We defined partisanship as responding either "Democrat" or "Republican" to the first question in the standard party identification stem question, "Generally speaking, do you think of yourself as a …?" We present question wording for both experiments in the appendix.

whether participants were using their allotted 20 seconds to look up answers using outside references. These questions demanded knowledge of obscure historical facts. Using these questions, we find little evidence that participants "cheated": rates of correct responding in the control and payment conditions were statistically indistinguishable.[10]

This experiment allows us to understand whether some partisan divergence in responses to factual questions arises because of the expressive benefit of providing partisan responses. We can do so by comparing divergence in the treatment and control conditions. As we discussed earlier, divergence will decrease only if our incentives are large enough to overcome the expressive value of partisan responding and if participants have beliefs about the correct responses that are both common across parties and sufficiently strong. Given the modest size of the incentives that we offered, we view these estimates as providing a lower bound on the importance of expressive partisan responding in explaining partisan divergence.

To measure partisan divergence, we create scale scores by coding all responses to range linearly from 0 to 1. The most Republican responses to each question are coded 0; the most Democratic responses are coded 1. If partisans are answering in a manner consistent with their partisanship, Democrats should offer "larger" responses than Republicans.

Table 1 shows the average partisan difference, by question, for those in the control group. Questions were asked in fixed order, but in Table 1 they are ordered by the size of the partisan gap observed in the control group, with the two placebo questions at the bottom. For nine of the ten non-placebo questions, we find positive partisan gaps that are consistent with our expectations about patterns of partisan responding.[11] Eight of those differences are significant at $p < .10$ (one-tailed). The gaps vary substantially in size, with the largest gaps for the questions about changes in causalities in Iraq between

[10] Correct-response rates in the control and treatment groups were 3% and 3% (Bangladesh) and 1% and 1% (price of gold), respectively. We also fielded an open-ended question about the offices held by George von L. Meyer. No participant answered this question correctly.

[11] The exception is the question about the change in the deficit under George W. Bush. There was almost no partisan divergence in responses to this question: Fully 88% of Democrats and 90% of Republicans correctly reported that the deficit increased under Bush.

2007 and 2008 and Bush's economic performance. For the placebo question about the price of gold we find an unexpected partisan gap, whereas for the question about Bangladesh's date of independence there is no gap. Those placebo questions are not included in our remaining analyses.

What effect do incentives for correct responses have on observed partisan divergence? To measure these effects, we estimate a model in which we predict differences in scale score R for individual *i* and question *j:*

$$R_{ij} = b_0 + b_1 Democrat_i + b_2 PayCorrect_i + b_3(Democrat_i \times PayCorrect_i) + Question_j + e_i,$$

where *Democrat* takes on the value 1 for Democratic participants and 0 for Republicans, *PayCorrect* = 1 for those assigned to the incentive condition, and *Question* is a vector of question-specific fixed effects. b_1 is therefore the average party difference in mean scale scores in the control condition, while $b_1 + b_3$ is the average party difference in the incentive condition. Prior research suggests $b_1 > 0$, while the theoretical model introduced above predicts that b_3 will be negative if partisans offer partisan-tinged responses in the absence of incentives, share common and sufficiently strong beliefs about the truth, and give less weight to partisan responding than to the expected value of the incentive. OLS estimates, with standard errors clustered at the respondent level, appear in Table 2.

Pooling across the eight non-placebo questions for which we observe statistically significant partisan gaps in the control condition, column (1) provides estimates of the average effect of incentives on responses.[12] The .118 ($p < .001$) coefficient for *Democrat* (b_1) is the average gap between Democrats and Republicans in the control condition. The –.065 ($p < .001$) coefficient for *Democrat* × *PayCorrect* (b_3) means that this gap is reduced to .053 (.118 – .065), or by 55%, when incentives are offered. In column (2), we add demographic controls; the results are nearly unchanged.

These results show that even modest incentives can substantially reduce partisan divergence in factual assessments. In this experiment, participants were told that answering correctly would improve

[12] This analysis excludes cases in which participants didn't provide a response, which occurs 3% of the time in both treatment and control conditions. Replacing those responses with party averages for that question produces substantively similar results. Analysis is available upon request. In Table A1 of the appendix, we repeat these analyses for each questions individually. In all eight cases, the estimate for b_3 is negative, although it is not usually statistically significant.

their chances of earning a $200 gift certificate, and that the baseline chance of winning was around 1 out of 100. Assuming that participants estimate that answering all questions correctly would double their chances of winning this prize, the expected value of answering any given question correctly is $0.167.[13] In turn, the finding that incentives reduced partisan gaps by more than 50% implies that more than half of the party gap may be generated by participants for whom partisan responding is worth less than $0.17.

Of course, we cannot ascertain why the remaining proportion (about 45%) of the partisan gap remains. Following our model, the individuals responsible for this gap may value partisan cheerleading more highly (high values of expressiveness, c), disagree about which response is correct (difference in $p(r_j)$ across parties), or be sufficiently uncertain about which response is correct that they cannot improve their chances of earning the incentive by deviating from their partisan response (uncertainty). To understand the role of awareness of one's own lack of knowledge, we now turn to our second experiment.

EXPERIMENT 2: THE EFFECT OF FINANCIAL INCENTIVES FOR CORRECT AND "DON'T KNOW" RESPONSES ON PARTISAN DIVERGENCE

We fielded our second experiment in 2012 with subjects whom we recruited from Amazon.com's Mechanical Turk marketplace.[14] Subjects were required to pass a two-question attention screener and were then randomly assigned to a control group (N = 156) or to one of three treatment groups, two of which we examine here.[15] In the first treatment group, participants were paid for correct responses (N = 534). In the second treatment group, participants were paid for both correct and "don't know" responses (N = 660). Below, we restrict our analysis to the 795 individuals in these three groups who

[13] (1/100 × $200)/12 questions = $0.167 per question.

[14] We recruited 1,506 participants for the MTurk study over the web from March 29, 2012 to April 16, 2012. See Appendix A for details. Because MTurk samples tend be more Democratic than the general population, we invited equal numbers of Democrats and Republicans who had previously taken our surveys to participate in this study. Of the 795 partisans analyzed, age ranged from 19 to 75 with a mean of 33, 54 percent were female, and 46 percent had at least a four-year college degree.

[15] In a third treatment, we paid participants a flat fee to answer questions post-treatment, the same incentive provided to the control group. However, we also allowed respondents to express "don't know" answers.

identified as either Democrats or Republicans.[16]

There are three major differences between this experiment and Experiment 1. First, and of greatest importance theoretically, we introduce a new treatment here, in which we offer subjects the opportunity to select "don't know" and incentives for both correct and "don't know" responses. Doing so allows us to estimate the degree to which partisan responding arises because participants are unaware[17] of correct responses, but are aware of their lack of knowledge. Therefore, unlike Experiment 1, Experiment 2 permits us to assess the extent to which partisan divergence that persists in the face of incentives for correct responses reflects knowing ignorance, rather than partisan cheerleading (as driven by large expressive returns) or sincere differences in beliefs.

Second, in both treatment conditions, we randomly vary the amount offered for correct responses. In the treatment that includes payment for "don't know" responses, we also vary the amount offered for that response. These randomizations allow us to assess the degree to which partisan divergence is affected by the size of incentives.

Third, for all of the questions asked in this experiment, we used a novel graphical input device to measure participants' attitudes. Figure 4 displays an example of the "slider" that we used to gather answers to each of the questions we asked. After we trained participants to use this interface (complete instructions appear in Appendix B), we asked them to respond to each question by manipulating the slider. As before, we gave subjects 20 seconds to answer each question to limit opportunities for consulting outside information sources. Additionally, in the conditions in which participants were paid for correct responses, subjects were informed that a response would be scored as correct if the slider overlapped the correct answer. The primary advantage of this input device is that it allows individuals to

[16] As in our first experiment, we defined partisanship as responding either "Democrat" or "Republican" to the first question in the standard party identification stem question, "Generally speaking, do you usually think of yourself as a Democrat, a Republican, an Independent, or what?" Of the 795 partisans in our sample, 65% were Democrats, 89 were assigned to the control group, 327 to the pay-for-correct-response group, and 379 to the pay-for-correct-and-"don't know" group.

[17] We use "unaware" loosely: "unaware" subjects include those who believe that one response option is most likely to be true, but for whom there is only a small difference in assessments of which answer is true (i.e., $|p(r_1) - p(r_2)|$ is small).

provide responses continuously across the entire range of possible responses instead of requiring categorical responses.

In all conditions, participants were initially asked five questions that were selected at random from a larger list that we describe below. All questions had a closed response format and we did not present a "don't know" response option. Their treatment was then introduced, and they were then asked seven more questions: two new questions followed by the same five questions that they had previously been asked. (See Appendix B for the text that we used to introduce each treatment.) In the control condition, participants were paid a flat $0.50 bonus to answer those seven post-treatment questions. In the pay-for-correct condition, participants were informed that they would be paid for each correct response, and the amount offered for each correct response was randomly assigned to be $0.10 with probability .25, $0.25 with probability .25, $0.50 with probability .25, $0.75 with probability .15, and $1.00 with probability .10.

Finally, in the pay-for-correct-and-"don't know" condition, participants were again informed they would be paid for each correct response, and the amount offered for each correct response was assigned as in the prior treatment. Participants in this treatment were also given "don't know" response options and told that they would be paid for selecting "don't know." The amount paid for "don't know" responses was also assigned randomly, and was a fraction of the amount offered for a correct response: 20% of the payment for a correct response with probability .33, 25% with probability .33, and 33% with probability .33.

We list the 12 questions that we fielded in this experiment in Table 3, which also shows the correct response and the range of the response options (i.e., the lower and upper bound of the labeled horizontal line) that we offered to participants. These questions were chosen so that correct responses varied across the entire range of potential answers: they were not concentrated at either end of the scale or in the middle. The direction of partisan responding also varied: sometimes, higher responses favored the Democratic Party; sometimes, they favored the Republican Party. As before, we used a placebo question

designed to assess whether or not participants were consulting outside references.[18]

As with Experiment 1, we recoded all responses to range from 0 to 1, with 1 indicating the most Democratic response. The right-hand column of Table 3 reports, for each question, the observed pre-treatment difference in mean scale scores between Democrat and Republican participants. (Recall that each participant was asked five pre-treatment questions.) We find statistically significant ($p < .10$, one-tailed) partisan gaps for ten of these questions, with the largest gaps for questions about unemployment under Bush and Obama, and the smallest gaps for a question about the proportion of the population that is foreign-born and for the placebo question about baseball. Our subsequent analysis is restricted to the ten non-placebo questions for which there are statistically significant pre-treatment partisan gaps.

The Effect of Incentives for Correct and "Don't Know" Responses

We begin by reporting the effect of the treatments on the frequency of selecting "don't know." Our model suggests that the rate at which participants select "don't know" when offered a payment for doing so indicates the degree to which they understand that they don't know the correct response to these questions. In particular, if beliefs about correct responses are sufficiently weak (i.e., uninformative about the truth) and preferences for expressive partisan responding are not too large, then choosing "don't know" when paid to do so will yield greater expected utility than either expressive or sincere responses.

Pooling across the non-placebo questions for which we found pre-treatment partisan gaps, we find that 47.8% of responses in the payment-for-correct-and-"don't know" condition are "don't know."[19] That is, nearly half of participants forgo a response that would allow them to support their party or give them a chance to earn a larger monetary incentive for a correct response.

Recall that for "don't know" responses, participants were randomly assigned to receive 20%, 25%, or 33% of the payment that they received for correct responses. Across these conditions, the frequency of "don't know" is 46%, 47%, and 50%, respectively. These differences are ordered as the

[18] See Appendix A for an analysis of reported efforts to look up correct responses using outside sources.

[19] By contrast, in the other treatment that we fielded, in which participants were paid a flat fee for their responses and also offered a "don't know" option (see note 15), only 14.8% of responses were "don't know."

theoretical model predicts, but only the difference in means between the 20% and 33% conditions approaches statistical significance ($p < .07$, one-tailed).

This pattern—frequent "don't know" responses when subjects are paid to say "don't know," even though they are also offered more for correct responses—implies that participants are sufficiently uncertain about the truth that they expect to earn more by selecting "don't know." For example, given that 46% of participants selected "don't know" when paid 20% of the correct-answer payment for "don't know" responses, and given that the slider covers 20% of the response space, we infer that participants' beliefs about the probability that a response is correct are nearly equal across responses. By contrast, if participants were confident that even 20% of the range of the scale did not include the correct answer, they would do better in expectation by simply guessing randomly from among the remaining 80% of the scale range.[20]

This great willingness to select "don't know" has important implications for our understanding of partisan divergence. In particular, participants who offer "don't know" responses behave in a manner that is consistent with this hypothesis: they know that their responses are otherwise partisan *and* that they don't know the truth. In the absence of incentives for "don't know" responses, they would offer insincere partisan responses, even if paid for correct ones, because they are both uninformed about the truth and aware of their ignorance. Overall, absent sufficiently strong beliefs about what the truth is, they cannot expect to earn more if paid only for correct responses.

To incorporate "don't know" responses into our analysis of partisan divergence, we must decide where to place those responses on the 0-1 scale that we use to analyze other responses. Because participants who admit that they don't know thereby forgo the opportunity to express support for their party, we treat these responses as being non-polarized. That is, we assign both Democrats and Republicans who choose "don't know" to the same position on the 0-1 scale. In particular, we assign

[20] This is so because the slider can cover up to $1/6^{th}$ of the response range, so random guessing from the entire range would be correct about 16.7% of the time. If 20% of the scale range is eliminated, randomly guessing from the remaining 80% of the scale would be correct about 20.8% of the time. This calculation assumes risk neutrality.

"don't know" responses for a given question to the average pre-treatment response that participants offered to that question. In practice, the particular value makes little difference to our analyses; the important point is that Democrats and Republicans are assigned to the same position on the scale if they say "don't know." One implication of this choice is that if all partisans chose "don't know," we would find no divergences between the parties.

As in the previous section, we study the effect of the treatments on party polarization by examining whether post-treatment partisan gaps differ between the control and treatment conditions.[21] Our analysis initially takes the following form:

$$R_{ij} = b_0 + b_1 PayCorrect_i + b_2 PayCorrectDK_i + b_3(Control_i \times Democrat_i) + b_4(PayCorrect_i \times Democrat_i) + b_5(PayCorrectDK_i \times Democrat_i) + Question_j + e_i,$$

where *Democrat* = 1 for Democratic participants and 0 for Republicans, *Control* = 1 for those assigned to the control condition, *PayCorrect* = 1 for those assigned to the pay-for-correct-response condition, *PayCorrectDK* = 1 for those assigned to the pay-for-correct-and-"don't know" condition, and *Question* is a vector of question-specific fixed effects. In this specification, b_3, b_4, and b_5, are the amount of partisan divergence in the control condition and the two treatment conditions. (This specification does not exploit, within treatment, variation in the amounts that we paid for correct and "don't know" responses.) Our expectation is that $b_3 > b_4$ and $b_3 > b_5$, that is that each treatment will reduce partisan divergence relative to the control (flat fee) condition. Additionally, our theoretical model suggests that some partisans who will not respond to incentives for correct responses will nonetheless respond to incentives for "don't know" responses. For this reason, we also predict $b_4 > b_5$.

The first column of Table 4 reports OLS estimates of the equation. (Parallel analysis for each individual question appears in Table A2 of Appendix A.) The estimate of b_3 is .145 ($p < .01$), which means that, on average, Democrats and Republicans in the control condition differ in their answers by about 15% of the range of the scale. The estimate of b_4 is only .058, and the difference between these two

[21] One alternative would be to compare pre-treatment responses to post-treatment responses in a given treatment condition. That analysis, however, would conflate the effect of the treatment with the effect of answering some questions a second time.

estimates is significant at $p < .01$. (This test statistic is reported in the second-to-last row of the table.) The difference indicates that only 40% of the previously observed party gap remains when participants are paid small amounts for correct responses. Despite the differences in subject pools, questions, and details of the experiment, this effect is similar in size to what we find in our analysis of Experiment 1. And, like Experiment 1, this result shows that analysis of survey responses as sincere expressions of factual beliefs likely overstates true partisan polarization.

This experiment also allows us to estimate the effect on apparent partisan polarization of incentives for "don't know" responses. The estimate of b_5 is .028, or about 80% smaller than the corresponding control-condition estimate and about 50% smaller than the pay-only-for-correct-response estimate. Both differences are significant at $p < .05$. In practical terms, this means that whereas the baseline (control-group difference) between Democrats and Republicans was about 15% of the scale range, it shrinks to 3% of the range when we offer incentives for both correct and "don't know" responses. To give a more concrete understanding of the importance of these differences, in the case of the question about change in unemployment under Bush, the response scale ranged from –2% to 4%, and the estimates imply that control-group Democrats offered a response that was about .9 percentage points higher than control-group Republicans. Among those paid for a correct response, these estimates suggest that gap was only .4 percentage points, and among those paid for both a correct and don't know response, it was only .2 percentage points.

From the perspective of voters trying to evaluate a president, an annual change in the unemployment rate of .2 points or greater happens more than 80 percent of the time, and a change of .4 points or greater happens 65 percent of the time. By contrast, a change of .9 points or greater happens only about 25 percent of the time.[22] Partisan gaps in survey response in the presence of incentives are therefore far more appropriately calibrated to year-to-year variation than the gaps suggested by unincentivized responses.

[22] Annual change in the unemployment rate from 1970 to 2012 retrieved from the BLS at http://data.bls.gov/timeseries/LNU04000000?years_option=all_years&periods_option=specific_periods&periods=Annual+Data.

We consider the robustness of these results in columns (2) through (4). In column (2) we estimate a Tobit specification, which allows us to account for the fact that our response scales were finite and therefore unable to accommodate extreme responses. The Tobit estimates are similar to those shown in column (1) and indications of statistical significance do not change. In columns (3) and (4) we examine different subsets of the questions that each respondent answered. Column 3 reports results only for those questions that respondents had also been asked at the pre-treatment stage. Column 4 reports results only for those questions that respondents had *not* been asked at the pre-treatment stage. Dividing the analysis in this way reduces the size of the sample in each column, but the pattern of effects remains: The partisan gap is largest in the control condition, around 60% smaller in the pay-for-correct-response condition, and around 80% smaller in the pay-for-correct-and-"don't know" condition. Indications of statistical significance are marginal in the column (4) specification, which is restricted to only two questions per respondent.

We can also leverage the variation in the incentive amounts provided to assess more fully the effect of differences in correct and "don't know" payments on observed divergence. A specification that exploits this variation appears in column (5). It includes indicators for each level of payment. These indicators appear separately and are interacted with partisanship. The resulting specification is highly flexible because it does not make any assumptions about the functional form of the effects of changes in payments.

The estimated .145 ($p < .05$) coefficient for *Democrat* is the average difference between Democrats and Republicans in the control condition. As expected, of the five interactions between amount paid for a correct response and *Democrat,* all are negative and statistically significant at $p < .10$, which means that party gaps are smaller when participants are offered incentives for correct responses. With one exception, they are also ordered in decreasing fashion. That is, larger payments are associated with smaller partisan gaps relative to the control group. The exception is the $0.75 payment for a correct response, which is associated with a decrease in the partisan gap of .06 ($p < .10$), smaller than the .08

decrease associated with a $0.10 payment for a correct response.[23] Focusing just on the comparison of the effect of the $1.00 and $.10 payment and acknowledging concerns about multiple comparisons, we estimate that partisan gaps are 56% smaller in the $0.10 payment condition than in the control group and 80% smaller in the $1.00 payment condition. The difference between the two coefficients (*Amount correct = $0.10 × Democrat* and *Amount correct = 1.00 × Democrat*) is marginally significant ($p < .10$, one-tailed test).

We can also assess the effects of variation in the amount paid for "don't know" responses. All of the interactions between the fractional payment amounts and partisanship are in the expected negative direction, meaning that adding incentives for "don't know" reduces partisan gaps. For payments that are 20% or 33% as large as the payments for correct responses, the estimates are statistically significant at $p < .10$ (two-tailed), and the pooled estimate of the effect of "don't know" payments is significant at $p < .05$. To interpret these coefficients, one can fix the payment for a correct response at $0.10, in which case the estimated partisan gap is .063 (.145 – .082, $p < .01$). Adding the "don't know" payment is estimated to reduce this party gap by between .02 (a 25% reduction for a "don't know" payment of $0.025) and .04 (a 65% reduction for a payment of $0.033).

The ordering of the effects for the proportional payments is mixed. The largest reduction in partisan divergence is associated with the 33% payment for "don't know" responses, the next-largest reduction is associated with the 20% payment, and the smallest reduction is associated with the 25% payment. None of these coefficients are statistically distinguishable from one another, perhaps reflecting the relatively small sample sizes in each condition.[24] At the same time, the point estimates imply that the combination of a $1.00 payment for a correct response and a $0.33 payment for a "don't know" response will eliminate *the entire* partisan gap between Democrats and Republicans in responses to partisan factual

[23] We note that this is one of two treatment conditions, the other being the $1.00 payment, which we undersampled for reasons of cost. There are 574 respondent-answers in the $0.75 payment condition, compared to 1000 on average in the $0.10, $0.25, and $0.50 payment conditions.

[24] For example, among those 1130 cases assigned to the $0.50 payment for a correct response, there are 571 [50%] in which no payment was offered for "don't know." The remaining cases were split almost equally across the three levels of proportional "don't know" payments.

questions.[25]

Taken as a whole, these results have two implications. First, as in Experiment 1, modest incentives substantially reduce partisan gaps, which is consistent with some portion of these gaps being due to expressive responding rather than to sincere differences in beliefs. Second, at least half of the partisan divergence that remains even in the presence of incentives for correct responses arises because people know that they do not know the correct response. On average, payments for correct responses in this experiment reduce partisan gaps by 60%. Adding "don't know" payments reduces partisan gaps by an additional 20 percentage points, leaving only 20% of the original gap. This implies that fully half of the remaining gap arose because participants were unaware of the correct response and understood their lack of knowledge. Indeed, the relatively high rate of selecting "don't know" (about 48% across "don't know" payment rates) suggests a great deal of self-aware lack of knowledge about the world. When offered a payment both for a correct response and a "don't know" response, nearly half of participants chose "don't know." In doing so, they gave up both the chance to engage in expressive partisan responding and the opportunity to earn a larger payment by offering a correct response.

DISCUSSION AND IMPLICATIONS

Our results have important implications for both political science and understandings of contemporary public opinion. Regarding the former, persistent partisan gaps, if sincere, suggest important limitations to democratic accountability. If Democrats and Republicans perceive different realities, then the incentives for incumbent politicians to pursue policies that generate objectively good policies may be reduced. Our results imply that such concerns are overstated. Democrats and Republicans may diverge in their survey reports of facts, but such responses should not be taken at face value as sincere expressions of partisan worldviews.

To make the magnitude of this concern clear, we use Experiment 1 to assess the correlation between survey assessments of factual matters and reported candidate preference. By comparing the

[25] This calculation is .145 – .116 – .041, which is actually slightly smaller than 0.

correlations in the control and treatment conditions, we can understand whether the use of cross-sectional survey measures to predict vote choice is biased when those measures are affected by partisan cheerleading. In particular, we estimate

$$PresVote_i = b_0 + b_1 FactualAssessments_i + b_2 PayCorrect_i + b_3(PayCorrect_i \times FactualAssessments_i) + e_i,$$

where *PresVote* = 1 indicates an intended vote for Obama and *PresVote* = 0 indicates an intended vote for McCain. (We exclude from the analyses those who aren't registered, prefer other candidates, or report that they won't vote.) *FactualAssessments* is a mean scale created from the eight items included in our earlier analysis of the experiment, with each item coded so that 1 is the most Democratic response and 0 is the most Republican response. *PayCorrect* is an indicator for assignment to the pay-for-correct-response condition. Existing research suggest $b_1 > 0$, that is, more Democratic assessments are associated with voting for the Democratic candidate. If those factual assessments are affected by partisan-consistent cheerleading when incentives are not offered, then that correlation should be reduced in the treatment condition, implying $b_3 < 0$.

We present OLS estimates with clustered standard errors in Table 5.[26] Per these estimates, a one-standard-deviation increase (.124) in the factual assessments scale is associated with a 22-percentage-point increase in the likelihood of voting for Obama ($p < .01$). Among those assigned to the treatment group, however, the negative estimate for b_3 means that this effect is substantially reduced ($p < .05$). In particular, the same shift in the assessments scale now increases the probability of voting for Obama by only 13 percentage points, a decrease of more than 40% in the effect of those assessments on voting. This means that the observed correlation between normal (unincentivized) survey reports of factual assessments and voting is exaggerated by the partisan "contamination" of those responses. Analysts should therefore craft research designs that allow them to distinguish the true relationship between sincere factual assessments and political choices from the apparent relationship that exists when factual assessments are affected by partisan expressive responding. Failure to do so likely biases inference about

[26] In this sample, the mean FactualAssessments score is .59 and 50% of the sample prefers Obama. Probit results are substantively similar.

the effect of the "perceptual screen" on retrospective voting.

Extending beyond political science, our results also inform understandings of contemporary public opinion. Scholarly and popular analysts alike frequently take survey responses at face value, assuming that what individuals choose in a survey context reflects their true underlying beliefs. While this assumption has been called into question for sensitive topics, our results suggest that the concern should be far more widespread. Indeed, in light of this concern, ongoing efforts to assess the dynamics of public opinion must grapple with the possibility that changes in partisan responses to many questions may not reflect changes in factual beliefs but changes in the degree to which different responses are understood as conveying support for one's party. (They may also reflect changes in the social returns to partisan cheerleading: see Iyengar, Sood, and Lelkes 2012). Further, if our results about factual questions extend to responses to non-factual survey items, our findings have important implications for partisan divergence in attitudinal self-reports.

CONCLUSION

A common feature of American politics is the existence of differences between Democrats and Republicans in survey assessments of factual beliefs. How should those differences be interpreted? One view is that they represent the stark reality of partisan bias, in which Democrats and Republicans perceive different realities. Another possibility, highlighted in this paper, is that differences in survey responses arise because surveys offer partisans low-cost opportunities to express their partisan affinities.

To highlight the distinction between sincere beliefs about the truth and survey responses, we have presented a model of survey response that incorporates the possibility of expressive partisan responding. The model shows that incentives for correct responses can be used to distinguish sincere from insincere partisan responding. It also shows that incentives will fail to reduce partisan responding if respondents understand that they are unaware of the truth. However, by providing incentives for both correct and "don't know" responses, one can estimate the proportion of partisan responding that arises because of either informed or uninformed partisan cheerleading.

Building from this model, we designed and fielded two novel experiments. In the first experiment, some participants were paid for correct responses to factual questions. The payments reduced observed partisan gaps by about 55%. In the second experiment, we also paid some participants for "don't know" responses. In this experiment, incentives for correct responses reduced partisan gaps by 60%, and incentives for "don't know" did so by an additional 20%, yielding partisan gaps that were 80% smaller than those that we observed in the absence of incentives. Taken together, these results provide a lower-bound estimate on the proportion of partisan divergence that arises because of the combination of expressive partisan returns and self-aware ignorance of the truth. Extending our analysis, we found that paying people for correct responses sharply reduces the power of factual assessments to predict vote choice.

Our work also highlights areas for subsequent research. The imprecision of our estimates about the effects of increasing incentives, for example, suggests the value of conducting additional experiments with larger samples. The apparent increasing effect of those incentives also implies that it would be desirable to ascertain whether even larger incentives can further reduce apparent bias by overcoming the tendency for individuals to engage in expressive partisan cheerleading. There is also the question of whether individual-level factors can explain which individuals are more likely to engage in expressive cheerleading, and which individuals are most responsive to these financial inducements.[27]

These questions aside, the core of our paper is the exposition of a model of expressive survey response and the implementation of a pair of experiments designed to distinguish that cheerleading behavior from sincere partisan divergence. We find that small financial inducements for correct responses can substantially reduce partisan divergence, and that these reductions are even larger when inducements are also provided for "don't know" answers. In light of these results, survey responses that indicate partisan polarization with respect to factual matters should not be taken at face value. Researchers and general analysts of public opinion should consider the possibility that the appearance of polarization is to a great extent an artifact of survey measurement rather than evidence of real differences in beliefs.

[27] See Appendix C for a preliminary discussion of accuracy.

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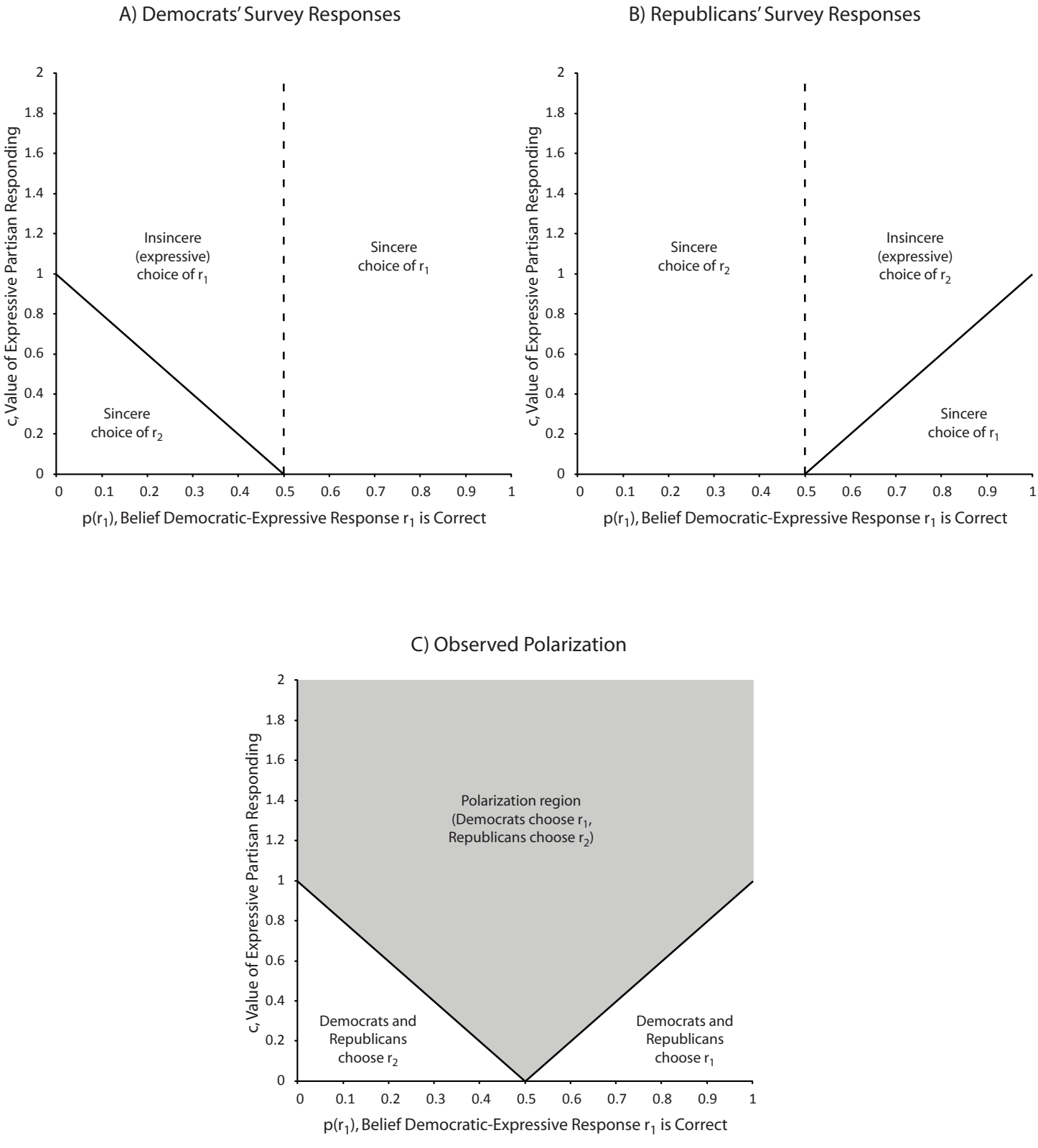
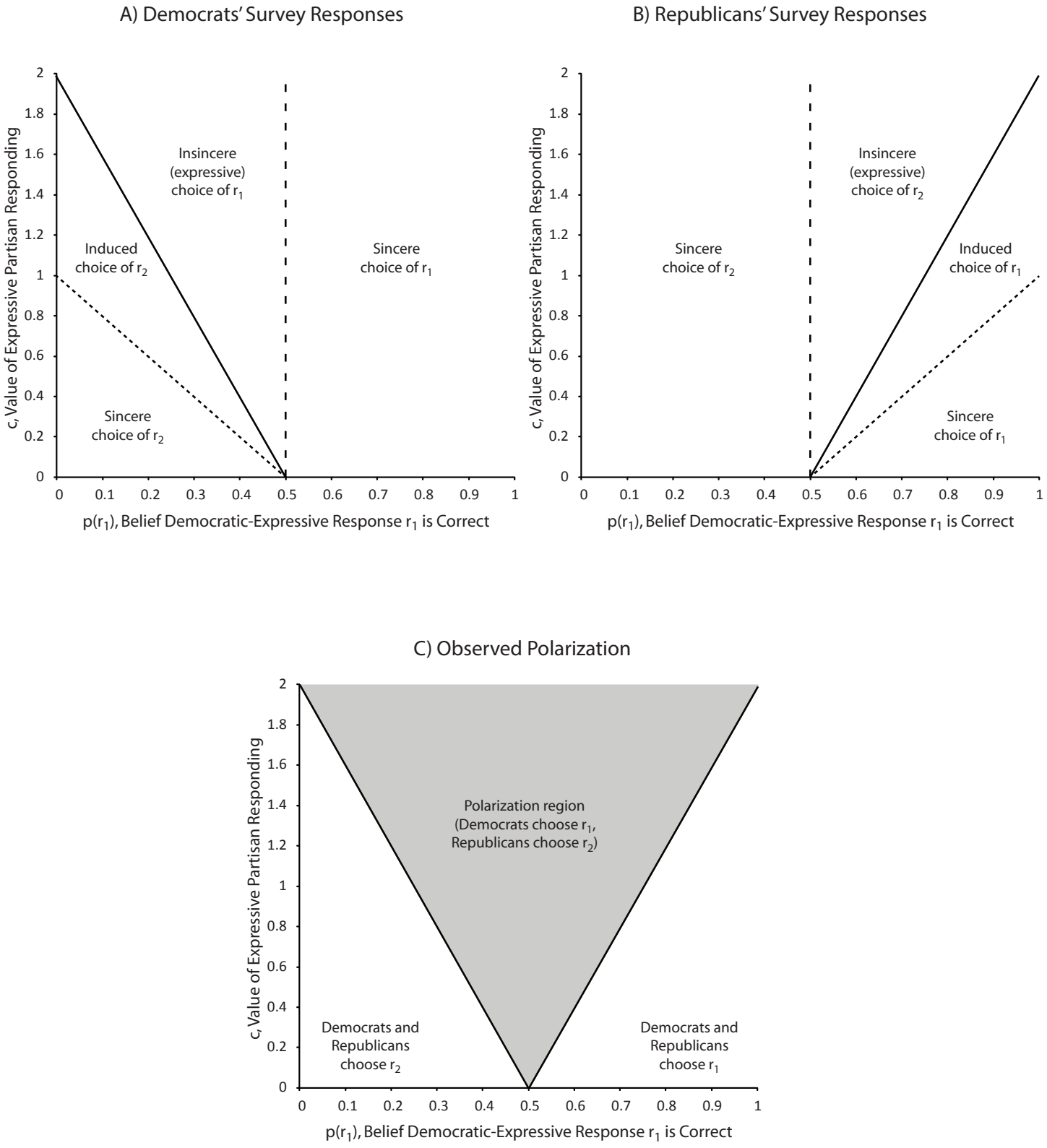
Figure 1: Patterns of Survey Response in the Absence of Incentives
by Value of Expressive Partisan Responding and Beliefs about Correct Responses



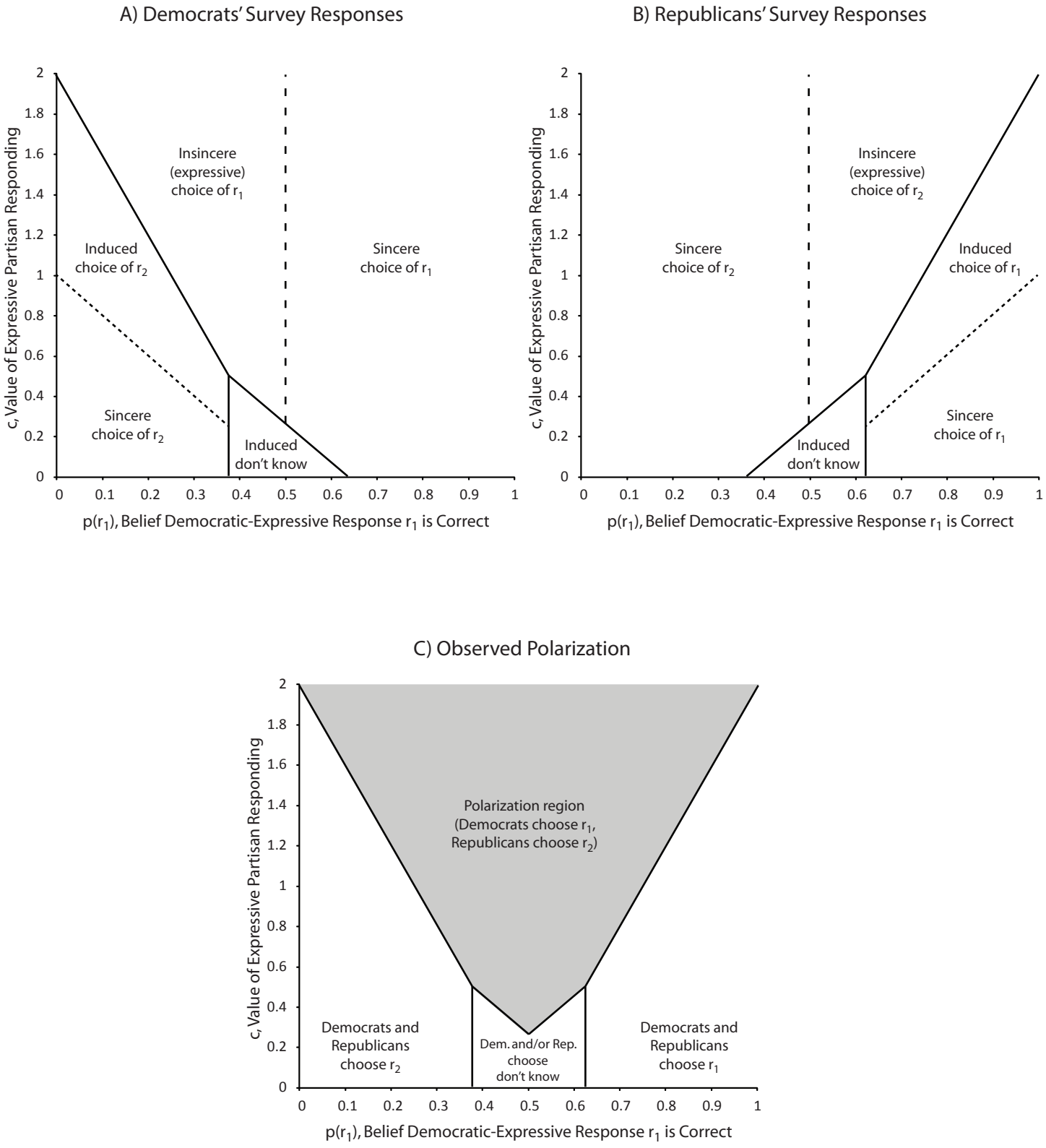
Note: Panel A displays Democrats' survey responses in the absence of incentives for different levels of returns to expressive partisan responding and beliefs about whether response r_1 is correct. Panel B displays responses for the same parameters for Republicans. Finally, the grey area in panel C is the range of parameters for which Democrats and Republicans offer different survey responses despite common beliefs about which response is correct.

Figure 2: Patterns of Survey Response Given Incentives for Correct Responses (I=1) by Value of Expressive Partisan Responding and Beliefs about Correct Responses



Note: Panel A displays Democrats' survey responses given incentives I=1 for correct responses for different levels of returns to expressive partisan responding and beliefs about whether response r_1 is correct. Panel B displays responses for the same parameters for Republicans. Finally, the grey area in panel C is the range of parameters for which Democrats and Republicans offer different survey responses despite common beliefs about which response is correct.

Figure 3: Patterns of Survey Response Given Incentives for Correct (I=1) and Don't Know (I_{dk}=.75) Responses by Value of Expressive Partisan Responding and Beliefs about Correct Responses



Note: Panel A displays Democrats' survey responses given incentives for correct (I=1) and don't know (I_{dk}=.75) responses for different levels of returns to expressive partisan responding and beliefs about whether response r_1 is correct. In all panels, V_{dk}=.5. Panel B displays responses for the same parameters for Republicans. Finally, the grey area in panel C is the range of parameters for which Democrats and Republicans offer different non-don't know survey responses despite common beliefs about which response is correct.

Figure 4: Example of Graphical Input Slider for Experiment #2

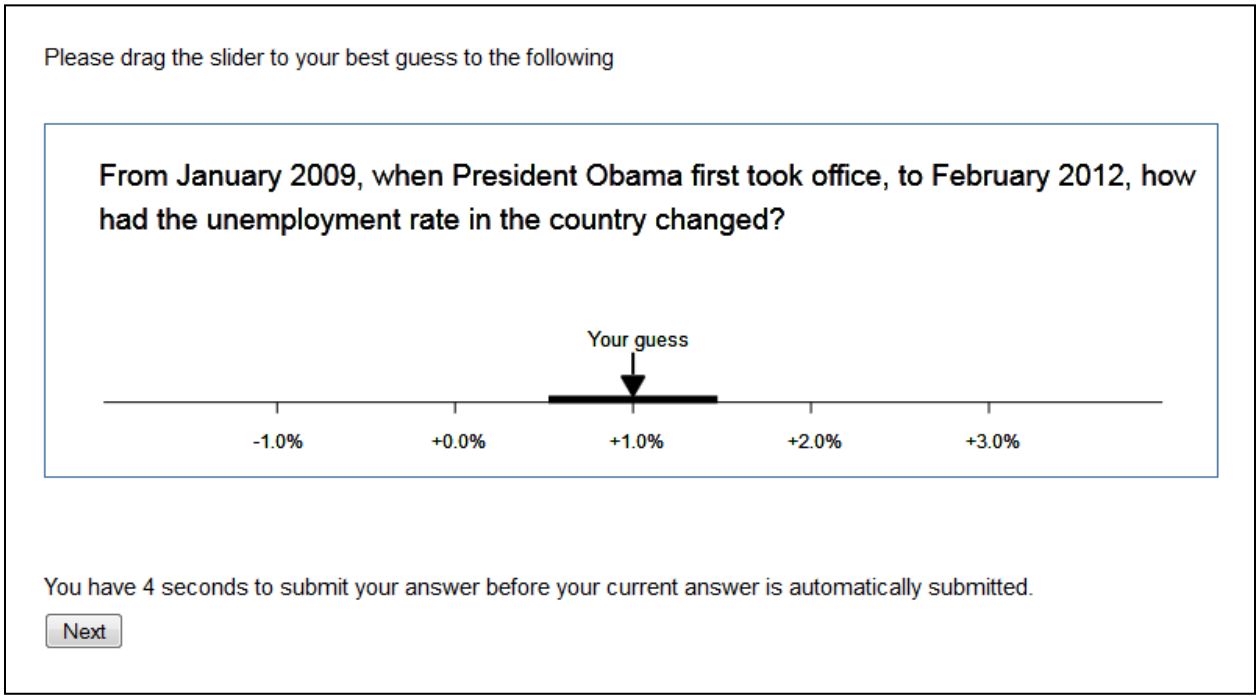


Table 1: Experiment 1, Question Wording and Baseline Partisan Differences in Scale Scores

Question	Question wording	Correct response	Control Group, Mean Democratic Response	Control Group, Mean Republican Response	Control Group Difference in Scale Scores, Democrats - Republicans	P-value of Difference of party means, 1-tailed test	N
Iraq 07 to 08 Change Casualties	Was the number of U.S. soldiers killed in Iraq in the first half of 2008 lower, about the same, or higher than the number who were killed in the second half of 2007?	*Lower (0),* About the same (.5), Higher (1)	0.416	0.177	0.239	0.000	212
Bush Inflation Change	Compared to January 2001, when President Bush first took office, has the level of inflation in the country increased, stayed the same, or decreased?	*Increased (1),* Stayed about the same (.5), Decreased (0)	0.894	0.694	0.201	0.000	207
Bush Unemployment Change	Compared to January 2001, when President Bush first took office, has the level of unemployment in the country increased, stayed the same, or decreased?	*Increased (1),* Stayed about the same (.5), Decreased (0)	0.766	0.598	0.168	0.002	208
Est. Bush Approval	About what percentage of *Americans* approve of the way that George W. Bush is handling his job as President?	*20% (1),* 30% (.75), 40% (.5), 50% (.25), 60% (0)	0.909	0.817	0.092	0.000	216
Iraq Total Casualties	About how many U.S. soldiers have been killed in Iraq since the invasion in March 2003?	*4,000 (0),* 8,000 (.25), 12,000 (.5), 16,000 (.75), 20,000 (1)	0.200	0.114	0.087	0.013	210
Est. Bush Approval Among Reps.	About what percentage of *Republicans* approve of the way that George W. Bush is handling his job as President?	40% (1), 50% (.75), *60% (.5),* 70% (.25), 80% (0)	0.794	0.724	0.070	0.039	211
Obama Age	How old is Barack Obama?	37 (0), 42 (.33), *47 (.66),* 52 (1)	0.558	0.508	0.050	0.055	213
McCain Age	How old is John McCain?	62 (0), 67 (.33), *72 (.66),* 77 (1)	0.681	0.637	0.044	0.035	215
Afgh. 07 to 08 Change Casualties	Was the number of U.S. soldiers killed in Afghanistan in the first half of 2008 lower, about the same, or higher than the number who were killed in the second half of 2007?	Lower (0), *About the same (.5),* Higher (1)	0.608	0.598	0.010	0.430	208
Bush Deficit Change	Compared to January 2001, when President Bush first took office, has the federal budget deficit in the country increased, stayed the same, or decreased?	*Increased (1),* Stayed about the same (.5), Decreased (0)	0.938	0.944	-0.006	0.589	212
Placebo, Gold Price 1980	What was the price of gold, in dollars per ounce, on January 18, 1980?	In dollars, 0=0, 1000=1, Correct is *between $800 and $900*	0.791	0.680	0.111	0.005	128
Placebo, Bangladeshi Indpc. Date	In what year did Bangladesh become independent of Pakistan?	In years, 1800=0, 2000=1, Correct is *1971*	0.151	0.185	-0.034	0.755	123

Note: Source: 2008 CCES Study. Questions are ordered by size of partisan gap in Control Group responses, with placebo questions at the bottom. All responses scaled 0 to 1, with 1 the most Democratic response.

Table 2: Experiment 1: Effect of Payment for Correct Responses on Partisan Divergence in Scale Scores

	(1)	(2)
	Mean Scale Score (0 to 1) (Pooled for 8 questions with partisan gap, p<.10, among control cases)	
Democrat (1=Yes, 0=Republican)	0.118	0.105
	[0.015]***	[0.016]***
Payment for Correct Response * Democrat	-0.065	-0.059
	[0.022]***	[0.022]***
Payment for Correct Response	0.038	0.031
	[0.016]**	[0.016]*
Knowledge (0-1)		0.013
		[0.015]
Race: White (1=yes)		0.017
		[0.024]
Race: Hispanic (1=yes)		0.040
		[0.028]
Race: Other Race (1=yes)		0.051
		[0.030]*
Female (1=yes)		0.016
		[0.012]
Age (Years)		0.001
		[0.002]
Age-squared/100		-0.001
		[0.002]
Region: Northeast		0.043
		[0.017]***
Region: Midwest		0.042
		[0.016]***
Region: South		0.014
		[0.014]
Income (1=<10k; 14=>150k; 15=RF/Missing)		0.005
		[0.002]**
Income Missing		-0.046
		[0.024]*
Education (1=No HS; 6=Post-grad)		0.000
		[0.006]
Education: No HS		0.006
		[0.024]
Education: Some college		0.019
		[0.014]
Education: 2-year college		0.032
		[0.026]
Education: 4-year college		-0.003
		[0.019]
Married/Domestic Partnership (1=yes)		-0.007
		[0.013]
Religious Attendance (1-6)		-0.002
		[0.004]
Constant	0.239	0.160
	[0.021]***	[0.059]***
Observations	3321	3299
R-squared	0.398	0.407

Note: Source: 2008 CCES study. Includes only Democrats and Republicans. Cases included are from control and paid for correct response condition. OLS Coefficients with robust standard errors, clustered by respondent. Question fixed effects not reported. * significant at 10%; ** significant at 5%; *** significant at 1% (two-tailed tests).

Table 3: Question Wording and Baseline Partisan Differences in Scale Scores, 2012 MTURK Study

Question	Question wording	Range of response line	Correct response	Pre-treatment, Mean Democratic Response	Pre-treatment, Mean Republican Response	Pre-Treatment Difference in Scale Scores, Democrats - Republicans	P-value of Difference of party means, 1-tailed test	N
Obama Unemployment	From January 2009, when President Obama first took office, to February 2012, how had the unemployment rate in the country changed?	-2 (Unemployment decreased) to 4% (Unemployment increased)	increased by 0.5 %	0.552	0.378	0.174	0.000	389
Bush II Unemployment	From January 2001, when President Bush first took office, to January 2009, when President Bush left office, how had the unemployment rate in the country changed?	-2 (Unemployment decreased) to 4% (Unemployment increased)	increased by 3.6 %	0.715	0.583	0.132	0.000	383
Defense Spending	For every dollar the federal government spent in fiscal year 2011, about how much went to the Department of Defense (US Military)?	3 to 27 cents	19.4 cents	0.731	0.631	0.101	0.000	355
Obama Vote 08	In the 2008 Presidential Election, Barack Obama defeated his Republican challenger John McCain. In the nation as a whole, of all the votes cast for Obama and McCain, what percentage went to Obama?	50 to 62%	53.70%	0.544	0.444	0.100	0.001	366
Iraq deaths % Black	Approximately 12 to 13% of the US population is Black. What percentage of US Soldiers killed in Iraq since the invasion in 2003 are Black?	9 to 21%	9.90%	0.430	0.344	0.085	0.006	373
Medicaid Spending	Medicaid is a jointly funded, Federal-State health insurance program for low-income and needy people. For every dollar the federal government spent in fiscal year 2011, about how much went to Medicaid?	3 to 27 cents	7.5 cents	0.577	0.502	0.075	0.013	343
TARP % Paid Back	The Treasury Department initiated TARP (the first bailout) during the financial crisis of 2008. TARP involved loans to banks, insurance companies, and auto companies. Of the $414 billion spent, what percentage had been repaid, as of March 15, 2012?	1 (Less repaid) to 100 (More repaid)	69.56%	0.391	0.324	0.068	0.027	349
Global Warming Amount	According to NASA, by how much did annual average global temperatures, in degrees Fahrenheit, differ in 2010 from the average annual global temperature between 1951 and 1980?	-1 (Temperatures cooler) to 2 (Temperatures warmer)	increased by 1.1 degrees	0.685	0.640	0.045	0.013	382
Iraq deaths	About how many U.S. soldiers were killed in Iraq between the invasion in 2003 and the withdrawal of troops in December 2011?	1000 to 7000	4,486	0.549	0.504	0.044	0.072	382
Debt Service Spending	The Treasury Department finances U.S. Government debt by selling bonds and other financial products. For every dollar the federal government spent in fiscal year 2011, about how much went to pay interest on those Treasury securities?	3 to 27 cents	6.2 cents	0.501	0.458	0.043	0.095	360
Foreign Born %	According to the Census Bureau, in 2010 what percentage of the total population of the United States was born outside of the United States (foreign-born)?	1 to 100%	12.92%	0.785	0.772	0.013	0.239	388
Placebo: Mantle home runs '61	In 1961, Roger Maris broke Babe Ruth's record for most home runs hit in a major league baseball season. He hit 61 home runs that year. How many home runs did his Yankees teammate Mickey Mantle hit in that year?	36 to 60	54	0.339	0.319	0.019	0.236	362

Note: Source 2012 Mturk Study. Questions are ordered by size of partisan gap in pre-treatment responses with placebo question at the bottom. All responses scaled 0 to 1, with 1 the most Democratic response.

Table 4: Experiment #2: Effect of Payment for Correct Responses on Partisan Divergence in Scale Scores

	(1)	(2)	(3)	(4)	(5)
Sample	All 10 non-placebo questions with partisan-gaps (p<.10) pre-treatment		Second time answering any of 10 non-placebo questions with partisan-gaps (p<.10) pre-treatment	First time answering any of 10 non-placebo questions with partisan-gaps (p<.10) pre-treatment	All 10 non-placebo questions with partisan-gaps (p<.10) pre-treatment
Specification	OLS	Tobit	OLS	OLS	OLS
Flat fee * Democrat (1=Yes, 0=Republican)	0.145	0.152	0.160	0.109	
	[0.028]***	[0.029]***	[0.029]***	[0.052]**	
Payment Correct * Democrat	0.058	0.061	0.062	0.047	
	[0.012]***	[0.013]***	[0.015]***	[0.025]*	
Payment DK and Correct * Democrat	0.028	0.029	0.033	0.015	
	[0.009]***	[0.009]***	[0.011]***	[0.015]	
Payment for Correct Response	0.018	0.018	0.022	0.007	
	[0.025]	[0.026]	[0.027]	[0.048]	
Payment for DK and Correct Response	0.049	0.052	0.056	0.033	
	[0.024]**	[0.025]**	[0.026]**	[0.046]	
Democrat (1=Yes, 0=Republican)					0.145
					[0.028]***
Amount correct = 0.10 * Democrat					-0.082
					[0.033]**
Amount correct = 0.25 * Democrat					-0.092
					[0.033]***
Amount correct = 0.50 * Democrat					-0.096
					[0.033]***
Amount correct = 0.75 * Democrat					-0.061
					[0.036]*
Amount correct = 1.00 * Democrat					-0.116
					[0.036]***
Prop. payment for DK=.20 * Democrat					-0.031
					[0.018]*
Prop. payment for DK=.25 * Democrat					-0.016
					[0.020]
Prop. payment for DK=.33 * Democrat					-0.041
					[0.020]**
Amount correct = 0.10					0.010
					[0.027]
Amount correct = 0.25					0.028
					[0.027]
Amount correct = 0.50					0.020
					[0.027]
Amount correct = 0.75					0.005
					[0.029]
Amount correct = 1.00					0.042
					[0.029]
Prop. payment for DK=.20					0.023
					[0.013]*
Prop. payment for DK=.25					0.030
					[0.017]*
Prop. payment for DK=.33					0.034
					[0.016]**
Constant	0.614	0.617	0.608	0.628	0.614
	[0.026]***	[0.026]***	[0.027]***	[0.048]***	[0.026]***
Observations	4608	4608	3275	1333	4608
R-squared	0.179		0.190	0.157	0.181
F-test, Flat fee * Dem. > Pay Correct * Dem.	0.000	0.000	0.000	0.140	
F-test, Pay Correct * Dem. > Pay DK and Correct * Dem.	0.020	0.020	0.060	0.130	

Source: 2012 MTURK study. Includes only Democrats and Republicans. Comparison of post-treatment responses in control, pay correct, and pay correct and don't know conditions. OLS Coefficients with robust standard errors in columns (1) and (3)-(5). Tobit results shown in column (2). Standard errors are clustered by respondent. Question fixed effects not reported. * significant at 10%; ** significant at 5%; *** significant at 1% (two-tailed tests).

Table 5: Experiment #1: Vote Choice by Average Factual Assessments Scale Score in Control and Pay Correct Conditions

	Presidential Vote (1=Dem., 0=Rep., .=Else)
Average factual assessments scale score (0=Most Republican, 1=Most Democratic)	1.770
	[0.222]***
Pay Correct * Average factual assessments scale score	-0.741
	[0.367]**
Pay Correct condition	0.418
	[0.224]*
Constant	-0.548
	[0.135]***
Observations	373
R-squared	0.130
Percentage of Scale Score Effect on Vote Eliminated in Pay Correct Condition	41.9%

Note: Source: 2008 CCES. Includes only Democrats and Republicans. Scale score is pooled across 8 non-placebo questions with partisan gaps in control condition. * significant at 10%; ** significant at 5%; *** significant at 1%

APPENDIX A

Experiment 1: Construction of the 2008 CCES Sample

The survey sample was part of a private module on the 2008 CCES, with a target population sample of 1,800 individuals. These questions were asked of a subset, drawn at random, of 626 of the 1,800 individuals in the full sample. The full sample is based on the 2005-06 American Community Study, November 2008 Current Population Survey, and the 2007 Pew Religious Life Survey. Thus, this target sample is representative of the general population on a broad range of characteristics including a variety of geographic (state, region and metropolitan statistical area), demographic (age, race, income, education and gender), and other measures (born-again status, employment, interest in news, party identification, ideology and turnout). Polimetrix invited a sample of their opt-in panel of 1.4 million survey respondents to participate in the study. Invitations were stratified based on age, race, gender, education and by simple random sampling within strata. For more detailed information on this type of survey and sampling technique see Vavreck and Rivers (2008). More broadly, see Baker et al. (2010) for a report on the potential strengths and limitations of online panels.

Experiment 2: Construction of MTurk Sample

Subjects for the experiment were recruited with an advertisement for "A quick survey to see what you know and how you learn." We also invited 868 previous participants in our surveys, 115 each strong Democrats and Republicans, 208 each Democrats and Republicans, and 111 each weak Democrats and Republicans, in an attempt to attract more Republicans than are ordinarily found in MTurk samples.

Experiment 2: Instructions to Subjects

The experiment had three conditions: a control condition, the pay-for-correct condition, and the pay-for-correct-and-"don't know" condition. (It also had a fourth condition that we do not analyze here: see Footnote 15.)

Instructions in the control condition: "Once again, your answers will be timed. By answering

these questions, you will earn an additional 50 cent bonus."

Instructions in the pay-for-correct condition: "Once again, your answers will be timed. Additionally, we are now going to give you a [X] cent bonus for each question you answer correctly. We'll tell you how many questions you get right at the end of the survey. You'll get credit for answering a question correctly if the thick horizontal bar underneath your arrow covers the correct answer. So, for example, in the picture below, the arrow is at 5. If the correct answer were 5.25, which is under the bar, you would earn the bonus. If the correct answer was 7, however, you would not earn the bonus."

Instructions in the pay-for-correct-and-"don't know" condition: "Once again, your answers will be timed. Additionally, we are now going to give you a X cent bonus for each question you answer correctly. We'll tell you how many questions you get right at the end of the survey. You'll get credit for answering a question correctly if the thick horizontal bar underneath your arrow covers the correct answer. So, for example, in the picture below, the arrow is at 5. If the correct answer were 5.25, which is under the bar, you would earn the bonus. If the correct answer was 7, however, you would not earn the bonus. As an alternative to being paid for a correct answer, you can instead earn a X × Y cent bonus for each question you tell us you don't know the answer to. We'll pay you for saying 'don't know' if you click the check box next to 'don't know,' but when you do so, the location of your arrow, whether correct or incorrect, does not affect your payment. Because the payment for 'don't know' is (Y × 100)% of the payment for getting an answer correct, you will on average earn more by selecting don't know than your best guess if you are less than (Y × 100)% sure that the bar underneath the arrow covers the correct answer."

Experiment 2: Analysis of Consultation of Outside References

After the survey was over, we asked participants if they had looked up the answers to each question that they were asked, noting explicitly that "Your bonus is already determined, and we won't change your bonus in any way on the basis of your answer to these questions." Of our 795 partisan participants, only 20 (2.5 percent) reported looking up the answer to 41 questions (0.74 percent of all questions asked). The percentages of user-questions by treatment assignment are 0.32 percent (control), 0.96 percent (pay for

correct), and 0.64 percent (pay for correct and pay for don't know).

Appendix References

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APPENDIX B

(Begins on following page)

You are being asked to complete an online research survey that will take approximately 7-9 minutes. The survey is conducted by researchers at Yale University to study how people learn. This page describes your consent.

Findings from this study may be reported in scholarly journals, at academic seminars, and at research association meetings. The data will be stored at a secured location and retained indefinitely. No identifying information about you will be made public and all of your choices will be kept completely confidential. Your participation is voluntary. You are free to stop the survey at any time without penalty.

There are no known risks associated with this study beyond those associated with everyday life. Although this study will not benefit you personally, we hope that our results will add to the knowledge about how people learn. You will receive $0.50 for completing the survey, paid through Amazon Mechanical Turk. You will also have the opportunity to earn a bonus of $0.50 or more, although not everyone will receive a bonus.

To participate in the study, you must be at least 18 years old and a United States resident. JavaScript must be activated on your browser so that the graphics in the survey will work properly. The next page will test your browser.

If you have any questions about the research, you can contact Seth Hill at seth.hill@yale.edu. If you have any questions about your rights as a research participant or concerns about the conduct of this study, you may contact the Yale University Human Subjects Committee, Box 208010, New Haven, CT 06520-8010, 203-785-4688, human.subjects@yale.edu.

When you are ready to begin, please elect to participate and press the Submit button. You will then be taken to the first page of the survey.

- (•) I agree to participate.
- ( ) I do not agree to participate.

Submit

To confirm that our survey graphics will work with your browser, please follow the instructions in the graphic below. You have 20 seconds to complete this task. After 20 seconds, your browser will automatically proceed to the next page.

Please drag the arrow as far as you can to the right. You can move the arrow by clicking on the arrowhead and dragging.

You have 16 seconds to submit your answer before your current answer is automatically submitted.

Please read carefully and answer the following questions.

Here are two personality traits that may or may not apply to you. Please check the box to indicate the extent to which *you agree or disagree with each statement*. You should rate the extent to which the pair of traits applies to you, even if one characteristic applies more strongly than the other. To demonstrate that you've read this much, just go ahead and select both disagree strongly and agree strongly for both questions below, no matter how you would actually answer each question. In other words, to confirm that you are paying attention, for each question please check both of these two boxes.

I see myself as: Dependable, self-disciplined.

- Agree strongly.
- Agree moderately.
- Agree a little.
- Neither agree nor disagree.
- Disagree a little.
- Disagree moderately.
- Disagree strongly.

I see myself as: Disorganized, careless.

- Agree strongly.
- Agree moderately.
- Agree a little.
- Neither agree nor disagree.
- Disagree a little.
- Disagree moderately.
- Disagree strongly.

Next

Please read carefully and answer the following questions.

What is the highest level of education that you have achieved?

- No high school diploma.
- High school diploma or equivalent.
- Some college.
- Two year degree.
- Four year college graduate.
- Post-graduate.

What is the year of your birth?

What is your gender?

- Female.
- Male.

What is your state of residence?

Generally speaking, do you usually think of yourself as a Democrat, a Republican, an Independent, or what?

- Democrat.
- Republican.
- Independent.
- Other.

Next

Please read carefully and answer the following questions.

Some people seem to follow what's going on in government and public affairs most of the time, whether there's an election going on or not. Others aren't that interested. Would you say you follow what's going on in government and public affairs...?

- Most of the time.
- Some of the time.
- Only now and then.
- Hardly at all.

We are interested in the kinds of things people do when they use the internet. What kinds of things have you used the internet for in the LAST SEVEN DAYS? (Choose as many as apply to you)

- Get directions.
- Plan vacations.
- Keep in touch with friends.
- Look at sports highlights.
- Find restaurants.
- Pay bills.
- Look up movie times.
- Shopping.
- Read the news.
- Read about politics.

Do you happen to know how much of a majority is required for the United States Senate and House to override a Presidential veto?

- A majority (fifty percent plus one vote).
- Two-thirds (sixty-seven percent).
- Three-fourths (seventy-five percent).
- Ninety percent.
- Don't know.

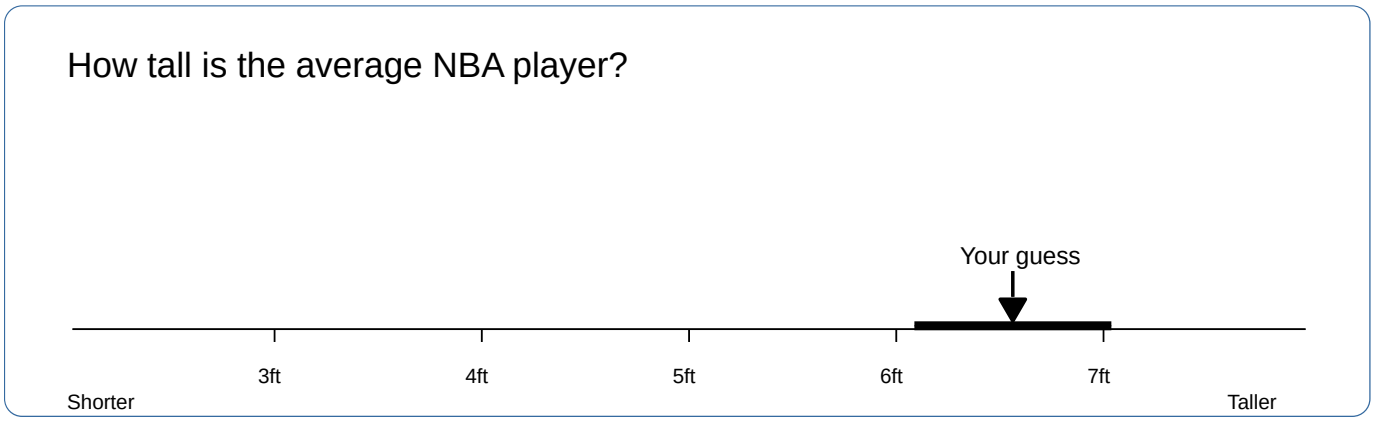
Do you think most professional athletes are good role models for children today?

- Yes.
- No.
- Don't know.

Next

In this study, we'd like you to tell us **what you think the correct answer is** to a number of questions. We don't want you to look up those answers or talk to someone else, so even if you don't know please just give us your best guess. For each question, we'll give you a short period of time -- 30 seconds -- to answer the question before we automatically take you to the next question.

To indicate your answer, we will ask you to slide the arrow on a line like that below to the point that is closest to your answer. You can slide that arrow by clicking your mouse on the arrowhead and dragging it to the left or right.

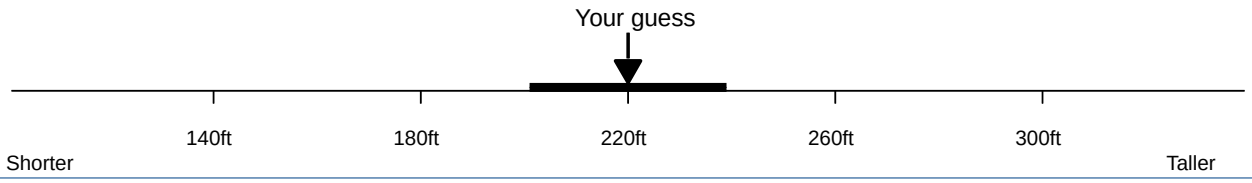


For example, in the above graphic, if you though the correct answer was 6 feet 6 inches, you would slide the arrow to the point midway between the lines marked 6 and 7 ft.

Give it a try! Once you are happy with where the arrow is located, you can click "Next." On the next page, we'll give you a timed example with another question.

Next

How tall is the Statue of Liberty, in feet, from the base of the feet to the top of the torch?



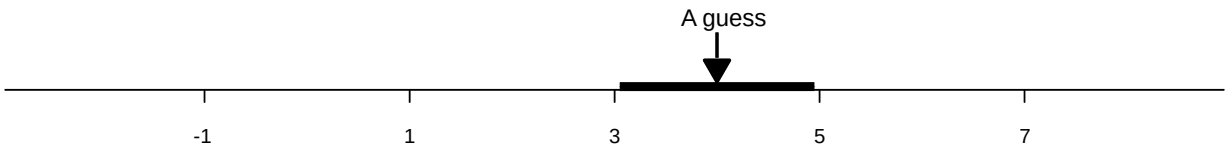
In this example, we are asking you to indicate your best guess as to how tall the Statue of Liberty is. You can also see how the countdown timer works -- you have 45 seconds to indicate your answer (see below). After you've indicated your best guess, click "Next" or just wait to go to the next page. When the timer is up, you will automatically be routed to the next page.

You have 45 seconds to submit your answer before your current answer is automatically submitted.

Next

We're almost ready to begin. Before we proceed, we just want to make sure we've been clear about what we are asking you to do.

Dave has two dozen apples. He eats half of them, and then eight more. How many apples are left?



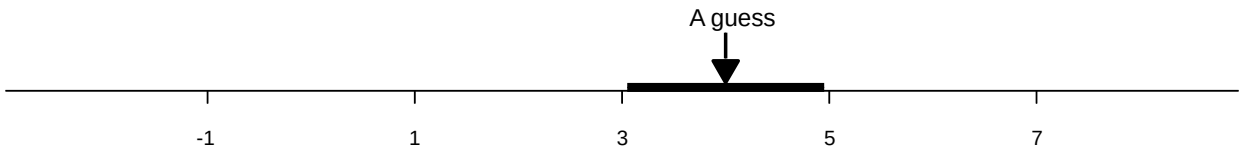
In the graph above, we've placed the arrow at a certain point to indicate somebody's response to the question. Which of the following has that person indicated is their best guess?

Their best guess is...

- 1.
- 2.
- 3.
- 4.
- 5.
- None of the above.

Next

Dave has two dozen apples. He eats half of them, and then eight more. How many apples are left?



The arrow is located midway between 3 and 5, so the person's response is 4.

Next

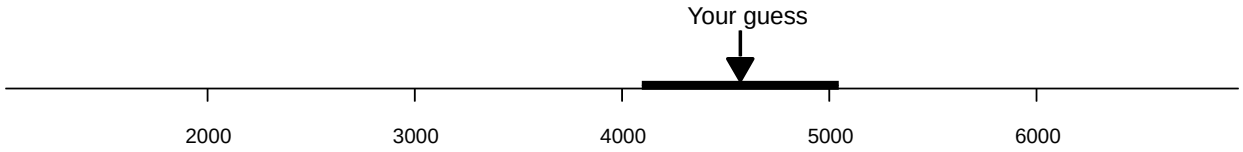
We will now send you to the actual survey. On the next screen, you will be presented with your first question and will only have **a limited amount of time to respond**.

Please **do not use the back button in your browser** during this survey. Any questions your answer a second time by using the back button will not be recorded. When you are ready, please click Next.

Next

Please drag the slider to your best guess to the following

About how many U.S. soldiers were killed in Iraq between the invasion in 2003 and the withdrawal of troops in December 2011?

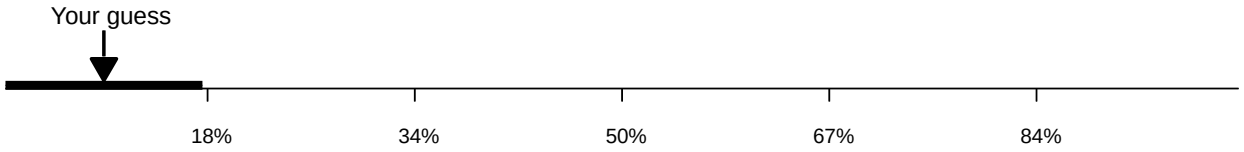


You have 27 seconds to submit your answer before your current answer is automatically submitted.

Next

Please drag the slider to your best guess to the following

According to the Census Bureau, in 2010 what percentage of the total population of the United States was born outside of the United States (foreign-born)?



You have 28 seconds to submit your answer before your current answer is automatically submitted.

Next

Thank you for answering those questions, we'd now like you to answer a few more questions.

Once again, your answers will be timed.

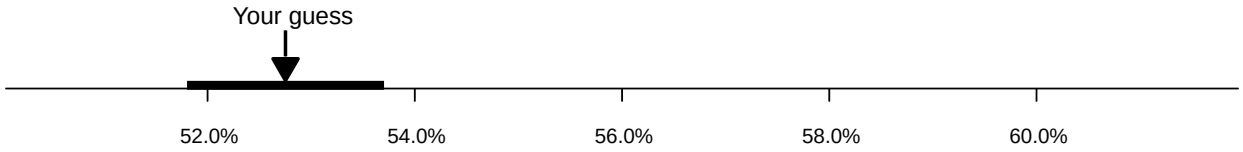
By answering these questions, you will earn an additional 50¢ bonus.

Again, please **do not use the back button in your browser**. Any questions your answer a second time by using the back button will not be recorded. When you are ready to proceed, please click Next.

Next

Please drag the slider to your best guess to the following

In the 2008 Presidential Election, Barack Obama defeated his Republican challenger John McCain. In the nation as a whole, of all the votes cast for Obama and McCain, what percentage went to Obama?

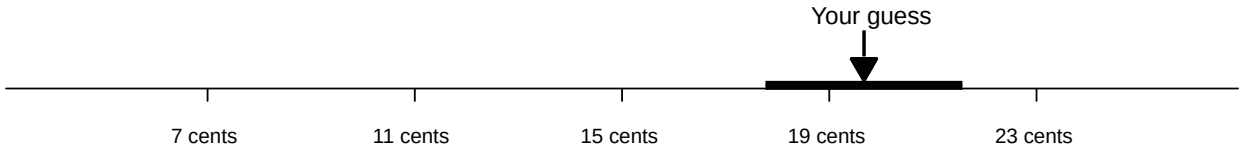


You have 28 seconds to submit your answer before your current answer is automatically submitted.

Next

Please drag the slider to your best guess to the following

For every dollar the federal government spent in fiscal year 2011, about how much went to the Department of Defense (US Military)?



You have 26 seconds to submit your answer before your current answer is automatically submitted.

Next

Thank you for your participation!

Your bonus is already determined, and we won't change your bonus in any way on the basis of your answer to these questions. For research purposes...

Did you look up the answer to this question?

In the 2008 Presidential Election, Barack Obama defeated his Republican challenger John McCain. In the nation as a whole, of all the votes cast for Obama and McCain, what percentage went to Obama?

- No, I did not look up th answer to this question.
- Yes, I did look up the answer to this question.

Did you look up the answer to this question?

For every dollar the federal government spent in fiscal year 2011, about how much went to the Department of Defense (US Military)?

- No, I did not look up th answer to this question.
- Yes, I did look up the answer to this question.

Did you look up the answer to this question?

About how many U.S. soldiers were killed in Iraq between the invasion in 2003 and the withdrawal of troops in December 2011?

- No, I did not look up th answer to this question.
- Yes, I did look up the answer to this question.

Did you look up the answer to this question?

According to the Census Bureau, in 2010 what percentage of the total population of the United States was born outside of the United States (foreign-born)?

- No, I did not look up th answer to this question.
- Yes, I did look up the answer to this question.

Did you look up the answer to this question?

Compared to January 2001, when President Bush first took office, how had the level of unemployment, as measured using the unemployment rate, in the country changed by the time he left office in January 2009?

- No, I did not look up th answer to this question.
- Yes, I did look up the answer to this question.

Did you look up the answer to this question?

The Treasury Department initiated TARP (the first bailout) during the financial crisis of 2008. TARP involved loans to banks, insurance companies, and auto companies. Of the $414 billion spent, what percentage had been repaid, as of March 15, 2012?

- No, I did not look up th answer to this question.
- Yes, I did look up the answer to this question.

Did you look up the answer to this question?

Medicaid is a jointly funded, Federal-State health insurance program for low-income and needy people. For every dollar the federal government spent in fiscal year 2011, about how much went to Medicaid?

- No, I did not look up th answer to this question.
- Yes, I did look up the answer to this question.

Next

Thank you for your participation!

What is the total number of Mechanical Turk surveys you have taken about current events or politics?

What is the total number of Mechanical Turk surveys you have taken about current events or politics **in the last month**?

If you would like to be contacted when we have future studies, please leave your email here. If not, leave blank:

If you would like to leave any comments or feedback, please do so here (up to 500 characters):

Pleast continue to the next page to retrieve your code for payment!

Next

Thank you for your participation!

You have now completed the survey.
If you have any questions, please contact seth.hill@yale.edu. If you have any questions about your rights as a research participant or concerns about the conduct of this study, you may contact the Yale University Human Subjects Committee at human.subjects@yale.edu.

For the purposes of getting paid on Mechanical Turk, please enter the following code into the box on the survey's Mechanical Turk HIT page. You must enter this code to get your bonus.

vuhtkwysobinecs

If you are curious about the sources we used to score your answers, please contact us through the Mechanical Turk interface and we are happy to provide references to you. Thank you!

APPENDIX C: ACCURACY

While the analysis reported in the main text focuses on polarization, a distinct question is whether or not offering incentives affects accuracy, or the degree to which expressed survey responses are correct. In the second experiment, we can examine the absolute distance between participants' survey responses across treatment conditions to assess the effect of incentives on accuracy. (That is, in the same 0 to 1 scale, we can calculate the difference between a respondent's slider placement and the correct answer in that 0 to 1 scale and then take the absolute value of the difference between those two numbers.) As before, however, we have to decide how to treat responses from those who select "don't know." We code those responses as accurate in this analysis, which means that selecting "don't know" will mechanically (if weakly) increase accuracy.

We find that there is no difference between the control (flat fee) condition and the pay for correct condition in accuracy: The average distance from the truth across questions and treatments is .28 in both cases.[1] Our earlier results show that offering incentives for correct responses substantially reduces partisan divergence. The analysis here suggests that convergence is, on average, no more likely to be toward the truth than away from it. Such a pattern is consistent either with shared bipartisan but inaccurate beliefs or, alternatively, very weak beliefs and small returns to expressive partisan responding such that individuals are effectively guessing across some range of the scale. Indeed, the relatively high frequency of selecting "don't know" in the pay for correct and don't know condition implies that many participants understand they don't have well-informed beliefs about the truth. Not surprisingly, therefore, we find substantially higher accuracy in that treatment condition: The average distance from the truth in the Pay for Correct and Don't Know treatment is .13, or 55% smaller than in either of the other conditions ($p<.01$ for tests of differences). Overall, then, when given the option to choose don't know, it appears that those who do so may understand that they systematically know less than those who do not.

[1] Regression results estimated from the model $\textit{Absolute Value of Distance from the Truth}_i = b_0 + b_1 \textit{PayCorrect}_i + b_2 \textit{PayCorrectDK}_i + \textit{Question} + e_i$ produce results substantively similar to simple difference in average *Absolute Value of Distance from the Truth* scores across treatments and are available upon request.

This assertion leads naturally to our last analysis: Among those assigned to the Pay for Correct and Don't Know condition, how are the pre-treatment survey responses of those who will be induced to select don't know different from those who will continue to give a response when offered a payment both for a correct and don't know answer? Are those who will select don't know less accurate, before being treated, then those who will continue to offer a response? Is this lack of knowledge, if it exists, associated with more or less partisan divergence? In order to understand this question, we can examine the pre-treatment survey responses, both in terms of absolute value of distance from the truth and partisan divergence. For the former, we estimate

$$\textit{Distance from the Truth}_{ijt=0} = b_0 + b_1\ \textit{Will Say Don't Know}_{ijt=1} + \textit{Question} + e_i,$$

where *Distance from the Truth* is the pre-treatment (t=0) absolute value of the distance from the correct response for question j and *Will Say Don't Know*=1 if the participants will select don't know the second time (t=1) they answer that question when offered incentives for doing so. If individuals who will later select "don't know" know less and understand that lack of knowledge, then we would predict $b_1 > 0$. OLS estimates employing this specification appear in column (1) of Appendix C Table C1. The distance from the truth among those who will continue to offer a response rather than selecting don't know is .185. Among those who will select don't know, this difference increases by .024, or about 13% ($p<.05$, one-tailed), indicating that those participants who say they don't know post-treatment were less accurate when answering the questions pre-treatment.

If these participants are less knowledgeable, is this associated with different levels of pre-treatment polarization? To answer this question, we estimate

$$R_{ijt=0} = b_0 + b_1\ \textit{Democrat}_i + b_2\ \textit{Will Say Don't Know}_{ijt=1} + b_3\ \text{Democrat}_i \times \textit{Will Say Don't Know}_{ijt=1} + \textit{Question} + e_i,$$

which is similar to our earlier models for assessing partisan divergence but instead examines pre-treatment responses by whether the participant will subsequently choose "don't know." In this model, b_1 is the baseline level of pre-treatment polarization between Democrats and Republicans, and b_3 is how much larger or smaller that estimate is among those who will later choose don't know. OLS estimates

appear in column (2) of Table C1. Here, we find that those who will later choose don't know are no more or less polarized than those who will continue to offer a response. Put differently, an apparent lack of knowledge (as demonstrated by a willingness to choose "don't know") is a marker of lack of knowledge about the truth, but those partisans still diverge by a similar amount that their more informed partisan counterparts. Divergence therefore persists but is centered on a different (less true) response than among those who appear to have greater knowledge.

Appendix Table A1: Experiment #1: Effect of Payment for Correct Responses on Partisan Divergence in Scale Scores by Question

	(1) Iraq 07 to 08 Change Casualties	(2) Bush Inflation Change	(3) Bush Unemployment Change	(4) Est. Bush Approval	(5) Iraq Total Casualties	(6) Est. Bush Approval Among Reps.	(7) Obama Age	(8) McCain Age
Democrat (1=Yes, 0=Republican)	0.239	0.201	0.168	0.092	0.087	0.070	0.050	0.044
	[0.052]***	[0.044]***	[0.056]***	[0.023]***	[0.038]**	[0.039]*	[0.031]	[0.025]*
Payment for Correct Response * Democrat	-0.078	-0.026	-0.074	-0.100	-0.064	-0.072	-0.048	-0.053
	[0.077]	[0.061]	[0.079]	[0.034]***	[0.054]	[0.055]	[0.045]	[0.033]
Payment for Correct Response	0.043	0.059	0.091	0.018	0.051	0.026	0.005	0.010
	[0.051]	[0.052]	[0.058]	[0.024]	[0.036]	[0.039]	[0.034]	[0.024]
Constant	0.177	0.694	0.598	0.818	0.114	0.724	0.508	0.637
	[0.033]***	[0.036]***	[0.042]***	[0.016]***	[0.024]***	[0.029]***	[0.023]***	[0.019]***
Observations	415	409	407	421	412	416	419	422
R-squared	0.064	0.093	0.032	0.044	0.014	0.008	0.008	0.012

Source: 2008 CCES study. Includes only Democrats and Republicans. Cases included are from control and paid for correct response condition. OLS Coefficients with robust standard errors. * significant at 10%; ** significant at 5%; *** significant at 1% (two-tailed tests).

Appendix Table A2: Experiment #2: Effect of Payment for Correct and Don't Know Responses on Partisan Divergence in Scale Scores by Question

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Obama Unemployment	Bush II Unemployment	Defense Spending	Obama Vote 08	Iraq deaths % Black	Medicaid Spending	TARP % Paid Back	Global Warming Amount	Iraq deaths	Debt Service Spending
Flat fee * Democrat (1=Yes, 0=Republican)	0.293	0.239	0.118	0.126	0.219	0.136	0.107	0.133	0.051	0.010
	[0.065]***	[0.068]***	[0.085]	[0.086]	[0.081]***	[0.086]	[0.091]	[0.057]**	[0.072]	[0.089]
Payment Correct * Democrat	0.083	0.142	0.097	0.035	0.013	0.048	0.048	0.026	0.009	0.073
	[0.042]**	[0.036]***	[0.038]**	[0.039]	[0.045]	[0.042]	[0.043]	[0.027]	[0.037]	[0.044]
Payment DK and Correct * Democrat	0.109	0.037	0.026	0.070	0.011	-0.003	0.016	0.039	-0.001	-0.025
	[0.032]***	[0.026]	[0.024]	[0.033]**	[0.030]	[0.025]	[0.032]	[0.019]**	[0.028]	[0.024]
Payment for Correct Response	0.021	-0.049	-0.053	-0.028	0.113	0.081	-0.019	0.058	-0.009	0.042
	[0.057]	[0.072]	[0.080]	[0.080]	[0.069]	[0.079]	[0.073]	[0.055]	[0.064]	[0.082]
Payment for DK and Correct Response	-0.019	0.079	0.059	-0.031	0.158	0.067	0.053	0.038	0.013	0.039
	[0.054]	[0.068]	[0.076]	[0.078]	[0.064]**	[0.073]	[0.071]	[0.053]	[0.062]	[0.076]
Constant	0.401	0.586	0.630	0.467	0.241	0.489	0.346	0.605	0.522	0.490
	[0.048]***	[0.066]***	[0.073]***	[0.073]***	[0.060]***	[0.071]***	[0.066]***	[0.050]***	[0.057]***	[0.074]***
Observations	444	485	446	457	470	442	452	466	479	467
R-squared	0.077	0.099	0.050	0.029	0.023	0.022	0.017	0.028	0.005	0.029
F-test, Flat fee * Dem. > Pay Correct * Dem.	0.000	0.100	0.410	0.170	0.010	0.180	0.280	0.050	0.300	0.260
F-test, Pay Correct * Dem. > Pay DK and Correct * Dem.	0.310	0.010	0.060	0.250	0.490	0.150	0.280	0.340	0.420	0.030

Source: 2012 MTURK study. Includes only Democrats and Republicans. Comparison of post-treatment responses in control, pay correct, and pay correct and don't know conditions. OLS Coefficients with robust standard errors. * significant at 10%; ** significant at 5%; *** significant at 1% (two-tailed tests).

Appendix Table C1: Experiment #2: Are Individuals who will be induced to select "Don't Know" more Polarized or less Knowledable?

	(1) Pre-treatment scale score (+= More Democratic)	(2) Pre-treatment absolute value of distance from correct answer
Democrat (1=Yes, 0=Republican)	0.078	
	[0.021]***	
Will say Don't Know * Democrat	-0.011	
	[0.031]	
Will say Don't Know Post-treatment	-0.033	0.024
	[0.026]	[0.012]*
Constant	0.657	0.185
	[0.025]***	[0.013]***
Observations	1547	1547
R-squared	0.146	0.157

Note: Source: 2012 MTURK study. Includes only Democrats and Republicans in pay correct and don't know condition. Robust standard errors, clustered by respondent. Question fixed effects not reported. Number of participants is 379.