

# **When corrections fail: The persistence of political misperceptions**

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## Abstract

A large literature addresses citizen ignorance, but very little research focuses on *misperceptions*. Can these false or unsubstantiated beliefs about politics be corrected? Previous studies have not tested the efficacy of corrections in a realistic format. We conducted four experiments in which subjects read mock news articles that included either a misleading claim from a politician, or a misleading claim and a correction. Results indicate that corrections frequently fail to reduce misperceptions among the targeted ideological group. We also document several instances of a “backfire” effect in which corrections actually *increase* misperceptions among the group in question.

“It ain’t what you don’t know that gets you into trouble. It’s what you know for sure that just ain’t so.”

-Mark Twain

A substantial amount of scholarship in political science has sought to determine whether citizens can participate meaningfully in politics. Recent work has shown that most citizens appear to lack factual knowledge about political matters (see, eg, Delli Carpini and Keeter 1996) and that this deficit affects the issue opinions that they express (Kuklinski et al 2000, Gilens 2001, Althaus 1998). Some scholars respond that citizens do not need to be “ambulatory encyclopedias,” arguing that citizens can successfully use heuristics, or information shortcuts, as a substitute for detailed factual information in some circumstances (Lupia and McCubbins 1998; Lupia 1994; Popkin 1991; Sniderman, Brody and Tetlock 1991).<sup>1</sup>

However, as Kuklinski et al point out (2000: 792), there is an important distinction between being *uninformed* and being *misinformed*. Advocates of heuristics typically assume that voters know they are uninformed and respond accordingly. But many citizens may base their policy preferences on false, misleading, or unsubstantiated information that they believe to be true (see, eg, Kuklinski et al 2000: 798).

The consequences of such misinformation for American politics can be profound. For instance, the claim that Iraq had weapons of mass destruction before the March 2003 U.S. invasion persisted long after the war, with 50% of the public endorsing this position as recently as July 2006 (Harris Poll 2006).<sup>2</sup> Given that the evidence against this claim

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<sup>1</sup> Kuklinski and Quirk (2000) and Lau and Redlawsk (2001) make a compelling argument that citizens are likely to fail to use heuristics correctly in even modestly complex situations.

<sup>2</sup> The previous Harris poll asking this question, which was conducted in February 2005, found 36% of the public believed that Iraq had WMD when the US invaded (Harris Poll 2006). Part of the reason for the increase to 50% may have been a press conference held by Rep. Peter Hoekstra and Sen. Rick Santorum on June 21, 2006 in which they claimed that the U.S. had found WMD in Iraq. It turned out that Hoekstra and

was widely publicized, it seems likely that many people were dismissing or ignoring this contradictory information.

From a normative perspective, it is especially important to determine whether misperceptions, which distort public opinion and political debate, can be *corrected*. Previous research has shown that citizens tend to resist or reject arguments and evidence contradicting their opinions (Taber and Lodge 2006; Lord, Ross, and Lepper 1979; Edwards and Smith 1996). Kuklinski et al. (2000) and Gilens (2001) find that it is possible in some cases to change issue opinions by directly providing subjects with relevant facts. However, such authoritative statements of fact (such as those provided by survey interviewer to a subject) are not reflective of how citizens typically receive and process information. Instead, people typically receive corrective information within “objective” news reports pitting two sides of an argument against each other, which is significantly more ambiguous than receiving a correct answer from an omniscient source.

In this paper, we report the results of two rounds of experiments investigating the extent to which corrective information embedded in realistic news reports succeeds in reducing prominent misperceptions about contemporary politics. In each of the four experiments, which were conducted in fall 2005 and spring 2006, ideological subgroups failed to update their beliefs when presented with corrective information that runs counter to their predispositions. Indeed, in several cases, we find that corrections actually *strengthened* misperceptions among the most strongly committed subjects.

The results presented in this paper contribute to the literature on correcting misperceptions in three important respects. First, instead of focusing on the effect of

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Santorum were referring to inactive chemical shells from the Iran-Iraq war, not the WMD that the US had sought to find in Iraq (Linzer 2006).

corrective information on issue opinions, we test the effects of corrections on factual beliefs. Second, we show that corrective information in news reports may fail to reduce citizen misperceptions and can sometimes even increase them. Finally, we establish these findings in the context of contemporary political issues that are salient to ordinary voters.

### **PREVIOUS RESEARCH ON CORRECTING MISPERCEPTIONS**

Surprisingly, only two major studies in political science consider the effects of attempts to correct factual misperceptions. First, Kuklinski, Quirk, Jerit, Schweider, and Rich (2000) conducted two experiments attempting to counter misperceptions about federal welfare programs. In the first, which was part of a telephone survey of Illinois residents, randomly selected treatment groups were given either a set of relevant facts about welfare or a multiple-choice quiz about the same set of facts. These groups and a control group were then asked for their opinions about two welfare policy issues. Kuklinski and his colleagues found that respondents had highly inaccurate beliefs about welfare generally; that the least informed people expressed the highest confidence in their answers; and that providing the relevant facts to respondents had no effect on their issue opinions (nor did it in an unreported experiment about health care). In a later experiment conducted on college students, they asked subjects how much of the national budget is spent on welfare and how much *should* be spent. Immediately afterward, the experimental group was provided with the correct answer to the first question. Unlike the first experiment, this more blunt treatment did change their opinions about welfare policy. Gilens (2001) also conducted an experiment in which survey interviewers provided relevant facts to subjects

before asking about their opinions on topical issues (crime and foreign aid). Like the second Kuklinski et al experiment (but unlike the first one), he found that this manipulation significantly changed respondents' issue opinions.

While both studies make significant contributions to our understanding of the consequences of misinformation for issue opinions, neither considers the effectiveness of corrective information on factual beliefs directly. In addition, the corrective information in both studies is presented directly to subjects as truth. Citizens are rarely provided with such definitive corrections, however. Instead, they typically receive corrective information in news reports that are less authoritative and direct. As a result, we believe it is imperative to study the effectiveness of corrections in news reports, particularly given the increasing demands from press critics for a more aggressive approach to fact-checking (e.g. Cunningham 2003). While it is important to establish that preference change *can* happen after an authoritative correction, we seek to investigate a more fundamental question – do citizens revise their factual beliefs after receiving corrective information in a more realistic format?

#### **THEORETICAL EXPECTATIONS**

Previous research indicates that citizens frequently reject evidence that contradicts their own opinions, suggesting that corrections are likely to be ineffective when the fact in question undermines a subject's political views. In particular, numerous studies in psychology have shown that people display biases in evaluating arguments and evidence, favoring those that reinforce their existing views and disparaging those that contradict their existing views (see, e.g., Lord, Ross, and Lepper 1979; Edwards and Smith 1996).

Taber and Lodge (2006) find a similar pattern when asking subjects to search for and evaluate the strength of pro/con arguments on two political issues. Their subjects rated attitudinally congruent arguments as stronger than incongruent ones, tended to seek out congruent sources, and spent more time counter-arguing incongruent arguments.

Studies also show that correcting previously stored facts can be difficult. Experimental research on the “continued influence effect” shows that incorrect information continues to influence subjects’ thinking even after they immediately receive an explicit correction telling them that it is false (Wilkes and Leatherbarrow 1988; Johnson and Seifert 1994; Wilkes and Reynolds 1999). Research indicates that people often have problems with negations for which they lack a congruent schema (Mayo et al 2004) or corrections that lack a causal explanation (Johnson and Seifert 1994, 1998). These findings suggest that people with strongly held beliefs may resist or struggle to process facts that do not square with their political worldview. We therefore predict that there will be a statistically significant interaction between the correction manipulation and ideology.

To fix ideas, suppose higher values on our ideology independent variable are associated with a greater likelihood of misperceptions on our dependent variable  $Y$  (where higher values indicate greater misperception). If the correction “works” and reduces misperception, then we expect that the coefficient  $\beta_1$  for the correction in Equation 1 below will be negative, while the coefficient  $\beta_2$  will be positive.

$$Y = \beta_0 + \beta_1 * \text{Correction} + \beta_2 * \text{Ideology} \quad (1)$$

However, our hypothesis is that the marginal effect varies along with ideology – specifically, that the correction will be less effective for those who are ideologically sympathetic to the misperception. Thus, we expect  $\beta_3$ , the coefficient for the interaction between the correction and ideology, to be positive in Equation 2 below.<sup>3</sup>

$$Y = \beta_0 + \beta_1 * \text{Correction} + \beta_2 * \text{Ideology} + \beta_3 * \text{Correction} * \text{Ideology} \quad (2)$$

We also expect that the marginal effect of the correction ( $\beta_1 + \beta_3 * \text{Ideology}$ ) will not be statistically distinguishable from zero for the relevant subgroup.<sup>4</sup> For instance, the expectation is that liberals will not update their beliefs when presented with information that corrects a misperception that is common among liberals (and likewise for conservatives). In addition, we expect that in some cases the interaction between corrections and ideology will be so strong that misperceptions will actually *increase* for the ideological subgroup in question.<sup>5</sup> For the purposes of this paper, we will label these the “resistance” hypothesis and the “backfire” hypothesis, respectively. While both are problematic from the perspective of democratic theory, the prospect that efforts to correct misperceptions will actually increase them among targeted groups is especially troubling. As shown below, this threat is very real when salient issues and realistic stimuli are employed.

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<sup>3</sup> The signs of the coefficients will vary in practice depending on whether misperceptions are more likely among liberals or conservatives.

<sup>4</sup> Our experiments are specifically designed to address misperceptions predominantly held by liberals as well as those that are prevalent among conservatives.

<sup>5</sup> In mathematical terms,  $\beta_1 + \beta_3 * \text{Ideology} > 0$  and the 95% confidence interval for the marginal effect will not include zero. The standard error of the marginal effect is

$\sqrt{\text{var}(\hat{\beta}_1) + \text{Ideology}^2 * \text{var}(\hat{\beta}_3) + 2 * \text{Ideology} * \text{cov}(\hat{\beta}_1, \hat{\beta}_3)}$  (Brambor, Clark, and Golder 2006).

## RESEARCH DESIGN

To evaluate the effects of corrective information, we conducted four experiments in which subjects read mock newspaper articles containing a statement from a political figure that reinforces a widespread misperception. Participants were randomly assigned to read articles that either included or did not include corrective information immediately after a false or misleading statement (see appendix for the full text of all four articles). They were then asked to answer a series of factual and opinion questions.

Because so little is known about the effectiveness of corrective information in contemporary politics, we designed the experiments to maximize external validity. First, we focus on controversial political issues from contemporary American politics (the war in Iraq, tax cuts, and stem cell research) rather than the hypothetical stories commonly found in psychology research (e.g. Johnson and Seifert 1994). As a result, our experiments seek to correct pre-existing misperceptions rather than constructing them within the experiment. While this choice is likely to make misperceptions more difficult to change, it increases our ability to address the motivating concern of this research – correcting misperceptions in the real world. In addition, we test the effectiveness of corrective information in the context of news reports, one of the primary mechanisms by which citizens acquire information. In order to maximize realism, we constructed the mock news articles used in the experiments using text from actual articles whenever possible.

The experiments we present in this paper were all conducted in the Viewflash online survey environment with undergraduates at a Catholic university in the Midwest.<sup>6</sup>

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<sup>6</sup> Participants, who received course credit for participation, signed up via an online subject pool management system and were provided with a link that randomly assigned them to treatment conditions.

Study 1, conducted in the Fall 2005 semester, tests the effect of a correction on the misperception that Iraq had weapons of mass destruction immediately before the war in Iraq. Study 2, which was conducted in the Spring 2006 semester, includes a second version of the Iraq WMD experiment as well as experiments attempting to correct misperceptions about the effect of tax cuts on revenue and federal policy toward stem cell research.

It is important to note that we define misperceptions to include both false *and* unsubstantiated beliefs about the world. As such, we consider two issues (the existence of Iraqi WMD and the effect of tax cuts on revenue) in which misperceptions are contradicted by the best available evidence, plus a third case (the belief that President Bush “banned” stem cell research) in which the misperception is demonstrably incorrect.<sup>7</sup>

### **STUDY 1: FALL 2005**

The first experiment we conducted, which took place in fall 2005, tested the effect of a correction embedded in a news report on beliefs that Iraq had weapons of mass destruction immediately before the U.S. invasion. One of the primary rationales for war offered by the Bush administration was Iraq’s alleged possession of biological and chemical weapons. Perhaps as a result, many Americans failed to accept or did not learn that WMD were never found inside the country. This misperception, which persisted long

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<sup>7</sup> In an observational study published after ours was completed, Gaines et al (2007) analyze how students update their beliefs about the war in Iraq over time. However, they define the relevant fact concerning Iraqi WMD as knowing that weapons were not found and describe the (unsupported) belief that Iraq hid or moved its WMD before the U.S. invasion as an “interpretation” of that fact. Our approach is different. Based on the evidence presented in the Duelfer Report, we define the belief that Saddam moved or hid his WMD before the invasion as a misperception.

after the evidence against it had become overwhelming, was closely linked to support for President Bush (Kull, Ramsay, and Lewis 2003).<sup>8</sup>

One possible explanation for the prevalence of the WMD misperception is that journalists failed to adequately fact-check Bush administration statements suggesting the U.S. *had* found WMD in Iraq (e.g. Allen 2003). As such, we test a correction condition (described below) in which a news report on a suggestive statement by President Bush is followed by a clarification that WMD had not been found.

Another plausible explanation for why Americans were failing to update their beliefs about Iraqi WMD is fear of death in the wake of September 11, 2001 terrorist attacks. To test this possibility, we draw on terror management theory, which researchers have suggested may help explain responses to 9/11 (Pyszczynski, Solomon, and Greenberg 2003). Previous studies have found that increasing the salience of subjects' mortality increased support for President Bush and for U.S. military interventions abroad among conservatives (Landau et al 2004, Cohen et al 2005, Pyszczynski et al 2006). We therefore employed a mortality salience manipulation to see if it increased misperceptions about Iraqi WMD or reduced the effectiveness of corrections.

### *Method*

130 participants<sup>9</sup> were randomly assigned to one of four treatments in a 2 (correction condition) x 2 (mortality salience) design.<sup>10</sup> The appendix provides the full text of the

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<sup>8</sup> Evidence on WMD did not change appreciably after the October 2004 release of the Duelfer Report. No other relevant developments took place until June 2006, when two members of Congress promoted the discovery of inactive chemical shells from the Iran-Iraq War as evidence of WMD (see footnote 2).

<sup>9</sup> 68 percent of respondents in Study 1 were female; 62 percent were white; 56 percent were Catholic. For a convenience sample, respondents were reasonably balanced on both ideology (48 percent left of center, 27 percent centrist, 25 percent right of center) and partisanship (27 percent Republican or lean Republican, 25 percent independent, 48 percent Democrat or lean Democrat).

article that was used in the experiment. Subjects in the mortality salience condition are asked to “Please briefly describe the emotions that the thought of your own death arouses in you” and to “Jot down, as specifically as you can, what you think will happen to you as you physically die and once you are physically dead.” (Controls were asked versions of the same questions in which watching television is substituted for death.)

After a distracter task, subjects were then asked to read a mock news article attributed to the Associated Press that reports on a Bush campaign stop in Wilkes-Barre, PA during October 2004. The article describes Bush’s remarks as “a rousing, no-retreat defense of the Iraq war” and quotes a line from the speech he actually gave in Wilkes-Barre: “There was a risk, a real risk, that Saddam Hussein would pass weapons or materials or information to terrorist networks, and in the world after September the 11th, that was a risk we could not afford to take.” Such wording may implicitly suggest to listeners that Saddam Hussein had WMD that he could have passed to terrorists. In the correction condition, the story then discusses the release of the Duelfer Report, which concluded that Iraq did not have WMD stockpiles or an active production program.

After reading the article, subjects were asked to state whether they agreed with this statement: “Immediately before the U.S. invasion, Iraq had an active weapons of mass destruction program, the ability to produce these weapons, and large stockpiles of WMD, but Saddam Hussein was able to hide or destroy these weapons right before U.S. forces arrived.” Responses were measured on a five-point Likert scale ranging from “strongly disagree” (1) to “strongly agree” (5).

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<sup>10</sup> The experiment was technically a 3 x 2 design with two types of corrections, but we omit the alternative correction condition here for ease of exposition. A separate paper will focus on the “causal” correction approach we have developed based on Johnson and Seifert (1994, 1998). Excluding these data does not substantively affect the key results presented in this paper.

## *Results*

The results from Study 1 largely support the backfire hypothesis, as shown by two ordered probit models that are presented in Table 1.

[Table 1]

Model 1 estimates the effect of the correction treatment; a centered seven-point ideology scale ranging from strongly liberal (-3) to strongly conservative (3); an additive five-question political knowledge scale (Delli Carpini and Keeter 1996); and the mortality salience manipulation. As expected, more knowledgeable subjects were less likely to agree that Iraq had WMD ( $p < .01$ ) and conservatives were more likely to agree with the statement ( $p < .01$ ). We also find that correction treatment did not reduce overall misperceptions and the mortality salience manipulation was statistically insignificant.<sup>11</sup>

In Model 2, we test whether the effect of the correction is moderated by subjects' political views by including an interaction between ideology and the treatment condition. As stated earlier, our hypothesis is that the correction will be increasingly ineffective as subjects become more conservative (and thus more sympathetic to the claim that Iraq had WMD). When we estimate the model, the interaction term is significant ( $p < .01$ ), suggesting that the effect of the correction does vary by ideology.

Because interaction terms are often difficult to interpret, we follow Brambor, Clark, and Golder (2006) and plot the estimated marginal effect of the correction and the 95% confidence interval over the range of ideology in Figure 1.

[Figure 1]

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<sup>11</sup> In addition, interactions between mortality salience and the correction condition were not statistically significant (results available upon request). As such, we do not discuss it further.

For very liberal subjects, the correction worked as expected, making them more likely to disagree with the statement that Iraq had WMD compared with controls. The correction did not have a statistically significant effect on individuals who described themselves as liberal, somewhat left of center, or centrist. But most importantly, the effect of the correction for individuals who placed themselves to the right of center ideologically is statistically significant and *positive*. In other words, the correction backfired – conservatives who received a correction telling them that Iraq did not have WMD were *more* likely to believe that Iraq had WMD than those in the control condition. (The interpretation of other variables does not change in Model 2.)

To illustrate the substantive effects of the correction/ideology interaction, Figure 2 plots predicted response probabilities across the dependent variable for four groups: self-identified liberals (ideology = -2) and conservatives (ideology = 2) who received the correction and those that do not.<sup>12</sup>

[Figure 2]

It is clear that responses to the correction differed dramatically by ideology. For liberals, the correction increased the predicted probability that subjects would “strongly disagree” that Saddam had WMD from .46 to .67 ( $p < .10$ ). By contrast, the predicted probability that conservatives would “somewhat agree” with the misperception increased from .30 to .52 ( $p < .01$ ) and the predicted probability that they would “somewhat disagree” decreased from .22 to .08 ( $p < .01$ ).

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<sup>12</sup> Subjects are assumed to have mean knowledge levels and to not have received the mortality salience manipulation. All predicted probabilities are calculated using S-Post (Long 1997). Confidence intervals on changes in predicted probabilities are estimated using the delta method in S-Post (Xu and Long 2005).

## **STUDY 2: SPRING 2006**

In spring 2006, we conducted a series of additional experiments designed to extend our findings and test the generality of the backfire effect found in Study 1. We sought to assess whether it generalizes to other issues such as tax cuts as well as other ideological subgroups (namely, liberals). The latter question is especially important for the debate over whether conservatism is uniquely characterized by dogmatism and rigidity (Jost et al 2003a, 2003b; Greenberg and Jonas 2003).

Another goal was to test whether the backfire effect was the result of perceived hostility on the part of the news source. Though we chose the Associated Press as the source for Study 1 due to its perceived neutrality, it is possible that conservatives felt that the correction was a reflection of media bias. There is an extensive literature showing that partisans and ideologues tend to view identical content as biased against them (Vallone, Ross, and Lepper 1985; Gunther and Schmitt 2004; Gunther and Chia 2001; Christen, Kannaovakun and Gunther 2002; Gussin and Baum 2004, 2005; Lee 2005; Arpan and Raney 2003). Perceptions of liberal media bias are especially widespread in the U.S., where 50 percent of the public recently described the media as liberal (Pew 2005). As such, we manipulated the news source as described below.

In Study 2, we used a 2 (correction) x 2 (media source) design to test corrections of three possible misperceptions: the beliefs that Iraq had WMD when the U.S. invaded, that tax cuts increase government revenue, and that President Bush banned on stem cell research. (The appendix presents the wording of all three experiments.) By design, the first two tested misperceptions held predominantly by conservatives and the third tested a

possible liberal misperception.<sup>13</sup> In addition, we varied the source of the news articles, attributing them to either the New York Times (a source many conservatives perceive as biased) or FoxNews.com (a source many conservatives perceive as favorable). 196 respondents participated in Study 2.<sup>14</sup>

#### *Method – Iraq WMD*

In our second round of data collection, we conducted a modified version of the experiment from Study 1 to verify and extend our previous results. For the sake of clarity, we simplified the stimulus and manipulation for the Iraq WMD article, changed the context from a 2004 campaign speech to a 2005 statement about Iraq, and used a simpler question as the dependent variable (see appendix for exact wording).

#### *Results – Iraq WMD*

Ordered probit analyses for the second version of the Iraq WMD experiment, which are presented in Table 2, differ substantially from the previous iteration.

[Table 2]

Interestingly, we could not reject the null hypothesis that the news source did not change the effect of the correction in this or the two following experiments (results available upon request). As such, it is excluded from all reported results.

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<sup>13</sup> We also conducted an experiment correcting a claim made by Michael Moore in the movie “Fahrenheit 9/11” that the war in Afghanistan was motivated by Unocal’s desire to build a natural gas pipeline through the country. All results of substantive importance to this paper were insignificant. The full wording and results of this experiment are available upon request.

<sup>14</sup> 62 percent of respondents to Study 2 were women; 59 percent were Catholic; and 65 percent were white. The sample was again reasonably balanced for a convenience sample on both ideology (52 percent left of center, 17 percent centrist, 31 percent right of center) and partisanship (46 percent Democrat or lean Democrat, 20 percent independent, 33 percent Republican or lean Republican).

Model 1 indicates that the WMD correction again fails to reduce overall misperceptions. However, we again add an interaction between the correction and ideology in Model 2 and find a statistically significant result. This time, however, the interaction term is *negative* – the opposite of the result from Study 1. Figure 3 plots the marginal effect of the correction over the range of ideology.

[Figure 3]

Unlike the previous experiment, the marginal effect of the correction is negative for individuals who placed themselves to the right of center, meaning that the correction made conservatives more likely to believe that Iraq did *not* have WMD.<sup>15</sup>

It is unclear why the correction was effective for conservatives in this experiment. One possibility is that conservatives may have shifted their grounds for supporting the war in tandem with the Bush administration, which sought to distance itself over time from the WMD rationale for war. The correlation between belief that George Bush “did the right thing” in invading Iraq and belief in Iraqi WMD among conservatives declined from .68 in Study 1 to .35 in Study 2. This was driven by the reaction to the correction; the correlation increased in Study 1 from .41 among controls to .72 in the correction condition, whereas in Study 2 it decreased from .54 to .10.<sup>16</sup> The second possibility is that the shift in the context of the article from the 2004 campaign to a 2005 statement by Bush (which are reflected in the wording of the manipulation) made ideology less salient in

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<sup>15</sup> Figure 3 suggests that the correction slightly increased misperceptions among individuals who rated themselves as very liberal, but this appears to be an anomaly – all four “very liberal” subjects who received the correction strongly disagreed with the claim that Iraq had WMD before the invasion.

<sup>16</sup> 65 subjects from Study 1 were asked this question, which was added to the instrument partway through its administration.

answering the question about Iraqi WMD. Finally, it is possible that the simpler wording of the dependent variable reduced ambiguity that previously allowed for counter-arguing.

Even though a backfire effect did not take place among conservatives, we conducted a post hoc analysis to see if conservatives who are the most intensely committed to Iraq would still persist in resisting the correction. Model 3 therefore includes a dummy variable for those respondents who rated Iraq as the most important problem facing the country today as well as the associated two- and three-way interactions with ideology and the correction condition. This model pushes the data to the limit since only 34 respondents rated Iraq the most important issue (including eight who placed themselves to the right of center ideologically). However, the results are consistent with our expectations – there is a positive, statistically significant interaction between ideology, the correction, and issue importance ( $p < .02$ ), indicating that the correction failed for conservatives who viewed Iraq as most important. Thus, even an effective correction may be resisted by highly committed subgroups.

Figure 4 illustrates this finding using predicted response probabilities from model 3 for liberals and conservatives with mean knowledge levels.

[Figure 4]

The predicted probability that conservatives who chose other issues as most important would “somewhat agree” with the misperception that Iraq had WMD before the invasion decreased from .46 to .25 ( $p < .05$ ). However, the predicted probabilities of responding “somewhat agree” among those who viewed Iraq as most important *increased* from .25 to .47 ( $p < .01$ ) – another backfire effect. Thus, while the correction was more effective than in Study 1, its effects were reversed for the most strongly committed subjects.

### *Method – Tax cuts*

The second experiment in Study 2 tests subjects' responses to the claim that cutting taxes stimulates so much economic growth that it actually has the effect of increasing government revenue over what it would otherwise be. The claim, which originates in supply-side economics and is frequently made by Bush administration officials, Republican members of Congress, and conservative elites, implies that tax cuts literally pay for themselves. However, the overwhelming consensus among professional economists – including current and former Bush administration officials – is that this claim is implausible in the U.S. context (Mankiw 2003, Milbank 2003, Hill 2006).

Subjects read an article on the tax cut debate attributed to either the New York Times or FoxNews.com (see appendix for text). In all conditions, it included a passage in which President Bush said “The tax relief stimulated economic vitality and growth and it has helped increase revenues to the Treasury.” As in Study 1, this quote – which implies that tax cuts increase revenue over what would have otherwise been received – is taken from an actual Bush speech. Subjects in the correction condition received an additional paragraph clarifying that tax revenues declined sharply as a proportion of GDP between 2001 and 2005 (Bush passed major tax cuts in 2001 and 2003). The dependent variable is agreement with the claim that “President Bush's tax cuts have increased government revenue” on a Likert scale ranging from strongly disagree (1) to strongly agree (5).

### *Results – tax cuts*

The two ordered probit models in Table 3 indicate that the tax cut correction generated another backfire effect.

[Table 3]

In Model 1, we find (as expected) that conservatives are more likely to believe that tax cuts increase government revenue ( $p < .01$ ) and more knowledgeable subjects are less likely to do so ( $p < .05$ ). More importantly, the correction again fails to cause a statistically significant decline in overall misperceptions. As before, we again estimate an interaction between the treatment and ideology in Model 2. The effect is positive and statistically significant ( $p < .05$ ), indicating that conservatives who received the treatment were significantly *more* likely to agree with the statement that tax cuts increased revenue than conservatives in the non-correction condition.

Figure 5 displays how the marginal effect of the correction varies by ideology.

[Figure 5]

As in the first Iraq experiment, the correction *increases* misperceptions among conservatives, with a positive and statistically significant marginal effect for self-described conservative and very conservative subjects ( $p < .05$ ). Figure 6 illustrates this effect by plotting the predicted response probabilities for liberals and conservatives with mean knowledge levels.

[Figure 6]

The predicted probabilities are virtually identical for liberals across the control and correction conditions, while the predicted probability that conservatives will “somewhat agree” that tax cuts increase revenue increasing from .35 to .48 ( $p < .01$ ). This finding provides additional evidence that efforts to correct misperceptions can backfire.

Conservatives presented with evidence that tax cuts do not increase government revenues ended up believing this claim more fervently than those who did not receive a correction.

#### *Method – Stem cell research*

While previous experiments considered issues on which conservatives are more likely to be misinformed, our expectation was that many liberals hold a misperception about the existence of a “ban” on stem cell research, a claim that both Senator John Kerry and Senator John Edwards made during the 2004 presidential campaign (Weiss and Fitzgerald 2004). In fact, while federal funding of stem cell research is limited to stem cell lines that had been created before August 2001, no limitations have been placed on privately funded research (Fournier 2004).

In the experiment, subjects read a mock news article attributed to either the New York Times or FoxNews.com that reported statements by Edwards and Kerry suggesting the existence of a stem cell research “ban.” In the treatment condition, a corrective paragraph was added to the end of the news story explaining that Bush’s policy does not limit privately funded stem cell research. The dependent variable is agreement with the statement that “President Bush has banned stem cell research in the United States,” a scale ranging from “strongly disagree” (1) to “strongly agree” (5). (See appendix for wording.)

#### *Results – Stem cell research*

Table 4 reports results from two ordered probit models, which offer support for the resistance hypothesis.

[Table 4]

In Model 1, we find a negative overall correction effect ( $p < .07$ ), indicating that subjects who received the correction were less likely to believe that Bush banned stem cell research. We also find that subjects with more political knowledge were less likely to agree that a ban existed ( $p < .07$ ). In Model 2, we again interact the correction treatment with ideology. The interaction is in the expected direction (negative) but just misses statistical significance ( $p < .16$ ). However, as Brambor, Clark, and Golder point out (2006: 74), it is not sufficient to consider the significance of an interaction term on its own. The marginal effects of the relevant independent variable need to be calculated for substantively meaningful values of the modifying variable in an interaction. Thus, as before, we estimate the marginal effect of the correction by ideology in Figure 7.

[Figure 7]

The figure shows that the stem cell correction has a negative and statistically significant marginal effect on misperceptions among centrists and individuals to the right of center, but fails to significantly reduce misperceptions among those to the left of center. Thus, the correction works for conservatives and moderates, but not for liberals.

In addition, we plot the substantive effects of the correction in Figure 8, which plots the predicted responses for liberals and conservatives with mean knowledge levels.

[Figure 8]

We find that the predicted probability that subjects “strongly disagree” with the stem cell misperception increases from .09 to .23 for conservatives ( $p < .05$ ), but predicted responses do not change appreciably for liberals. While in this case we do not find a

backfire effect, the effect of the correction is again *neutralized* for the relevant ideological subgroup. This finding provides additional evidence that the effect of corrections is likely to be conditional on one's political predispositions.

## **Conclusion**

The experiments reported in this paper help us understand why factual misperceptions about politics are so persistent. We find that responses to corrections in mock news articles differ significantly according to subjects' ideological preferences. As a result, the corrections fail to reduce misperceptions for the most committed participants. Even worse, they actually *strengthen* misperceptions among ideological subgroups in several cases. Additional results indicate that these conclusions are not specific to the Iraq war; not related to the salience of death; and not a reaction to the source of the correction.

These discouraging findings seem to provide further support for the growing literature showing that citizens engage in motivated reasoning. While our experiments focused on assessing the effectiveness of corrections, the results show that ideological commitments can override direct factual contradictions – an empirical finding with important theoretical implications. Previous research on motivated reasoning has largely focused on the evaluation and usage of facts in constructing opinions and evaluating arguments (e.g. Taber and Lodge 2006). By contrast, our research – the first to directly measure the effectiveness of corrections in a realistic context – suggests that it would be valuable to directly study the cognitive and affective processes that take place when subjects are confronted with discordant factual information. Gaines et al (2007) take an important first step in this direction by highlighting the construction of *interpretations* of

relevant political facts, including those that may be otherwise discomforting, as a coping strategy. Further research in this area is necessary.

It would also be helpful to test additional corrections of liberal misperceptions. Currently, all of our backfire results come from conservatives – a finding that may provide support for the hypothesis that conservatives are especially dogmatic (Jost et al 2003a, 2003b; Greenberg and Jonas 2003). However, without conducting more studies, it is impossible to determine if the results we observe are systematic or the result of the specific misperceptions tested.

Most importantly, however, future work must distinguish the conditions under which corrections reduce misperceptions from those under which they fail or backfire. Many citizens seem or unwilling to revise their beliefs in the face of corrective information, and attempts to correct those mistaken beliefs may only make matters worse. Determining the best way to provide corrective information will not only advance understanding of how citizens process information, but help journalists and civic educators to strengthen democratic debate and political understanding in America.

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## **Appendix**

### *Study 1 (WMD): News text*

Wilkes-Barre, PA, October 7, 2004 (AP) -- President Bush delivered a hard-hitting speech here today that made his strategy for the remainder of the campaign crystal clear: a rousing, no-retreat defense of the Iraq war.

Bush maintained Wednesday that the war in Iraq was the right thing to do and that Iraq stood out as a place where terrorists might get weapons of mass destruction.

“There was a risk, a real risk, that Saddam Hussein would pass weapons or materials or information to terrorist networks, and in the world after September the 11th, that was a risk we could not afford to take,” Bush said.

[Correction]

While Bush was making campaign stops in Pennsylvania, the Central Intelligence Agency released a report that concludes that Saddam Hussein did not possess stockpiles of illicit weapons at the time of the U.S. invasion in March 2003, nor was any program to produce them under way at the time. The report, authored by Charles Duelfer, who advises the director of central intelligence on Iraqi weapons, says Saddam made a decision sometime in the 1990s to destroy known stockpiles of chemical weapons. Duelfer also said that inspectors destroyed the nuclear program sometime after 1991.

[All subjects]

The President travels to Ohio tomorrow for more campaign stops.

### *Study 1 (WMD): Dependent variable*

Immediately before the U.S. invasion, Iraq had an active weapons of mass destruction program, the ability to produce these weapons, and large stockpiles of WMD, but Saddam Hussein was able to hide or destroy these weapons right before U.S. forces arrived.

- Strongly disagree [1]
- Somewhat disagree [2]
- Neither agree nor disagree [3]
- Somewhat agree [4]
- Strongly agree [5]

*Study 2, Experiment 1 (WMD): News text*

[New York Times/FoxNews.com]

December 14, 2005

During a speech in Washington, DC on Wednesday, President Bush maintained that the war in Iraq was the right thing to do and that Iraq stood out as a place where terrorists might get weapons of mass destruction.

“There was a risk, a real risk, that Saddam Hussein would pass weapons or materials or information to terrorist networks, and in the world after September the 11th, that was a risk we could not afford to take,” Bush said.

[Correction]

In 2004, the Central Intelligence Agency released a report that concludes that Saddam Hussein did not possess stockpiles of illicit weapons at the time of the U.S. invasion in March 2003, nor was any program to produce them under way at the time.

[All subjects]

The President travels to Ohio tomorrow to give another speech about Iraq.

*Study 2, Experiment 1 (WMD): Dependent variable*

Immediately before the U.S. invasion, Iraq had an active weapons of mass destruction program and large stockpiles of WMD.

- Strongly disagree [1]
- Somewhat disagree [2]
- Neither agree nor disagree [3]
- Somewhat agree [4]
- Strongly agree [5]

*Study 2, Experiment 2 (Tax cuts): News text*

[New York Times/FoxNews.com]

August 6, 2005

President George W. Bush urged Congress to make permanent the tax cuts enacted during his first term and draft legislation to bolster the Social Security program, after the lawmakers return from their August break.

“The tax relief stimulated economic vitality and growth and it has helped increase revenues to the Treasury,” Bush said in his weekly radio address. “The increased revenues and our spending restraint have led to good progress in reducing the federal deficit.”

The expanding economy is helping reduce the amount of money the U.S. government plans to borrow from July through September, the Treasury Department said on Wednesday. The government will borrow a net \$59 billion in the current quarter, \$44 billion less than it originally predicted, as a surge in tax revenue cut the forecast for the federal budget deficit.

The White House’s Office of Management and Budget last month forecast a \$333 billion budget gap for the fiscal year that ends Sept. 30, down from a record \$412 billion last year.

[Correction]

However, even with the recent increases, revenues in 2005 will remain well below previous projections from the Congressional Budget Office. The major tax cut of 2001 and further cuts in each of the last three years were followed by an unprecedented three-year decline in nominal tax revenues, from \$2 trillion in 2000 to \$1.8 trillion in 2003. Last year, revenues rebounded slightly to \$1.9 trillion. But at 16.3 percent of the gross domestic product, last year’s revenue total, measured against the size of the economy, was the lowest level since 1959.

*Study 2, Experiment 2 (Tax cuts): Dependent variable*

President Bush’s tax cuts have increased government revenue.

- Strongly disagree [1]
- Somewhat disagree [2]
- Neither agree nor disagree [3]
- Somewhat agree [4]
- Strongly agree [5]

*Study 2, Experiment 3 (Stem cell research): News text*

[New York Times/FoxNews.com]

August 10, 2004

Sen. John Edwards (D-N.C.) yesterday slammed President Bush and promised that a Kerry administration would support the promising young field of embryonic stem cell research.

The vice presidential contender's comments came on the third anniversary of President Bush's televised address to the nation announcing a funding policy for the controversial research, which relies on human embryos as a source of cells.

The much-debated but still experimental field of study has become an unanticipated wedge issue in this fall's election. Edwards's running mate on the Democratic ticket, Sen. John F. Kerry (Mass.), mentioned the topic in a number of speeches last week. Kerry also devoted a large chunk of the Democrats' weekly radio address Saturday to it, saying that science should not be sacrificed for ideology.

"We're going to lift the ban on stem cell research," Kerry said. "We're going to listen to our scientists and stand up for science. We're going to say yes to knowledge, yes to discovery and yes to a new era of hope for all Americans."

[Correction]

However, experts pointed out that Bush's action does not limit private funding of stem cell research. He is actually the first president to allow the use of federal funds to study human embryonic stem cells, but his policy limits federal support of such research to colonies derived from embryos already destroyed by August 2001.

*Study 2, Experiment 3 (Stem cell research): Dependent variable*

President Bush has banned stem cell research in the United States.

-Strongly disagree [1]

-Somewhat disagree [2]

-Neither agree nor disagree [3]

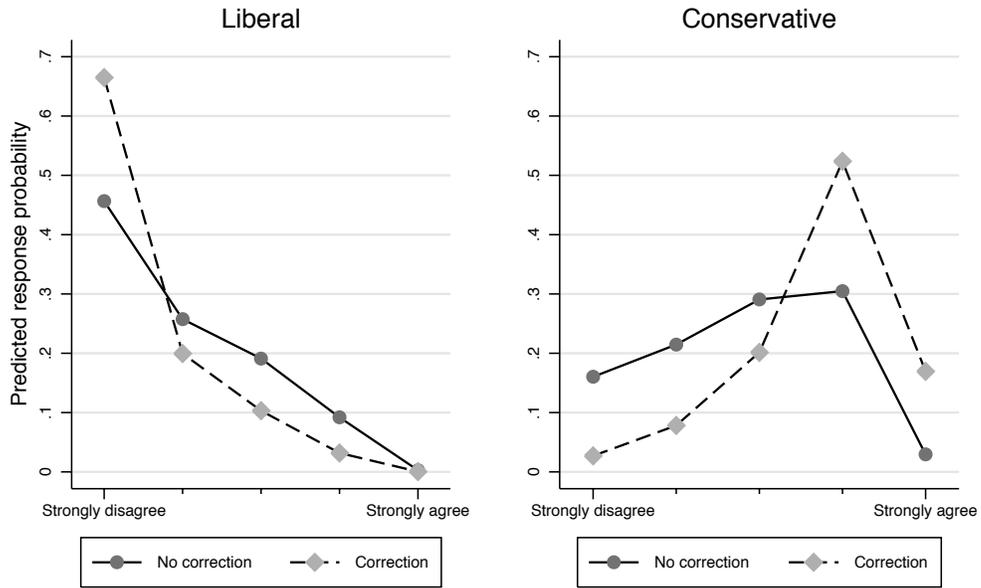
-Somewhat agree [4]

-Strongly agree [5]



Figure 2

Did Iraq have WMD?  
Predicted opinion: Fall 2005



**Figure 3**

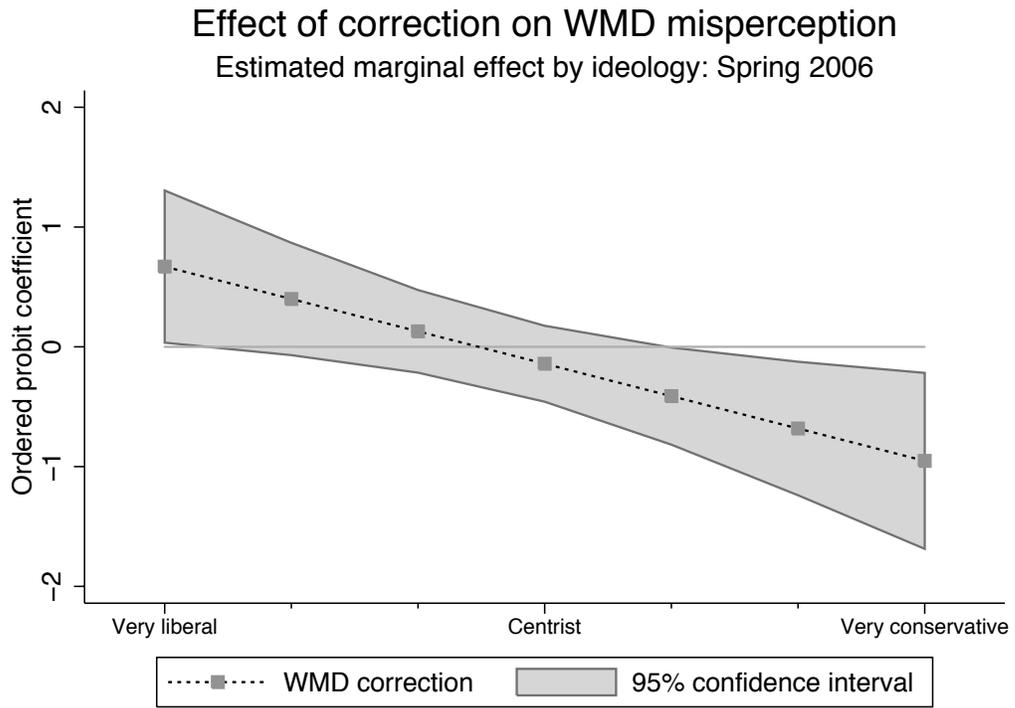


Figure 4

### Did Iraq have WMD? Predicted opinion: Spring 2006

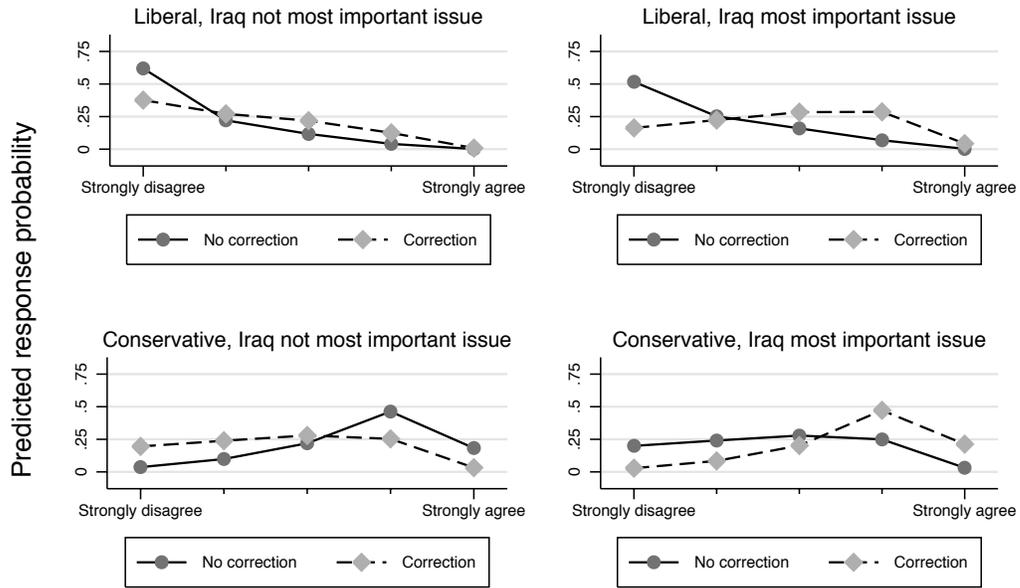


Figure 5

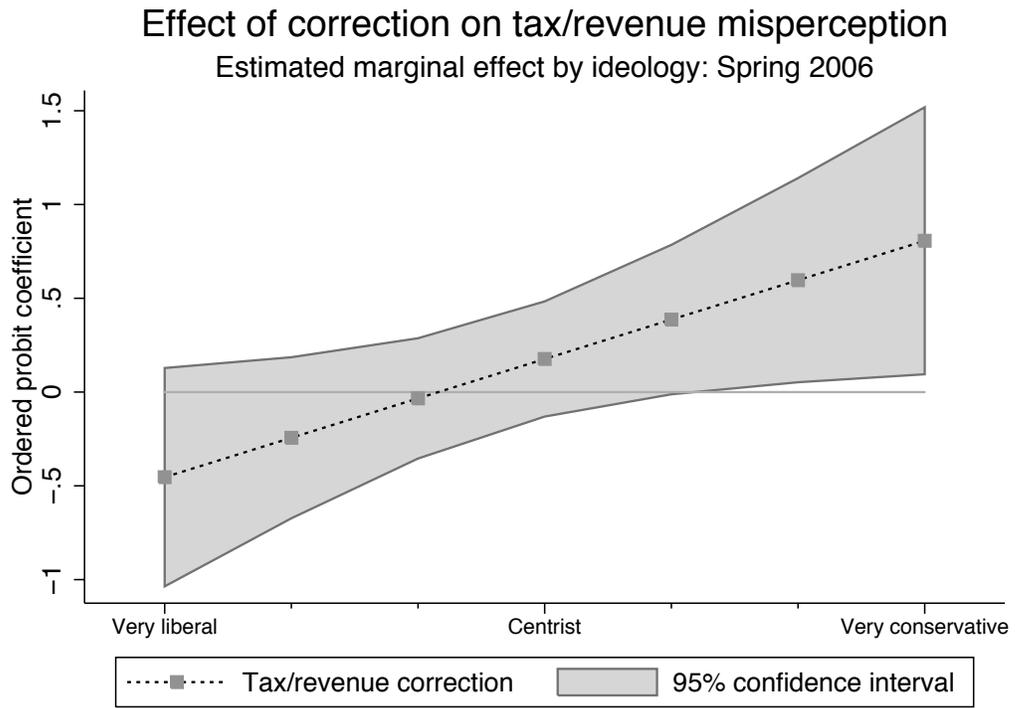


Figure 6

### Do tax cuts increase revenue?

Predicted opinion: Spring 2006

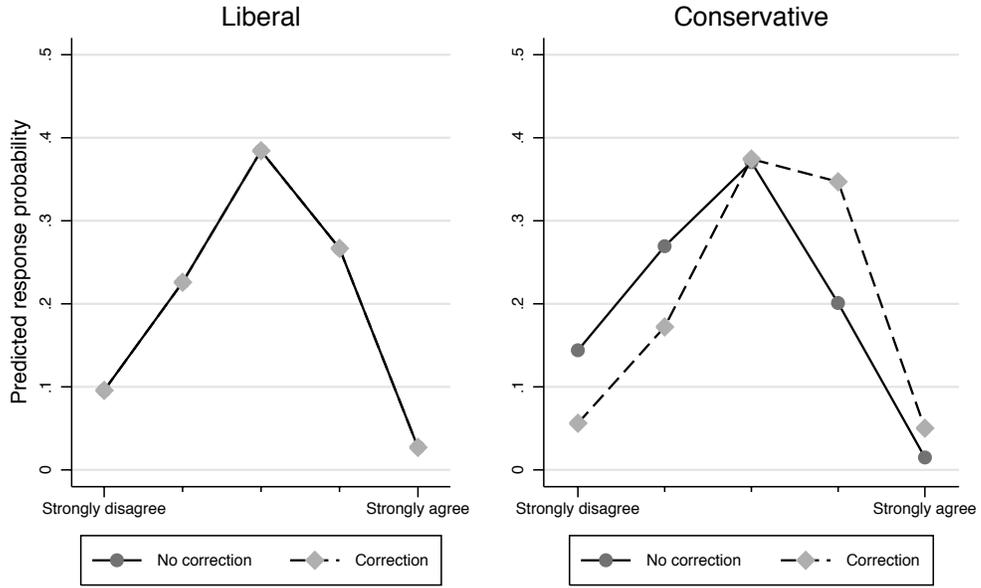


Figure 7

Effect of correction on stem cell ban misperception  
Estimated marginal effect by ideology: Spring 2006

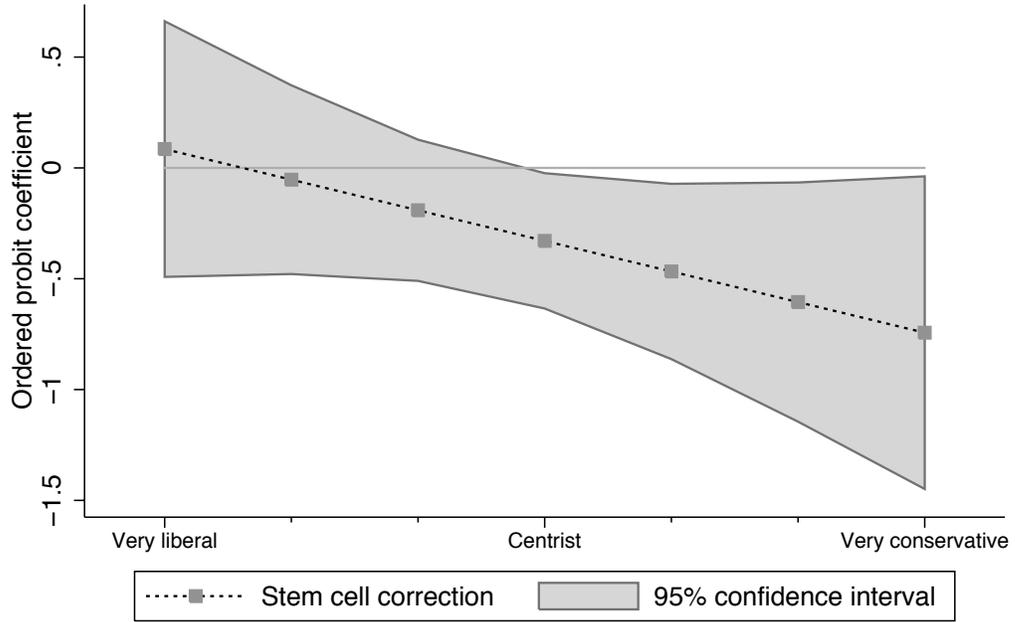
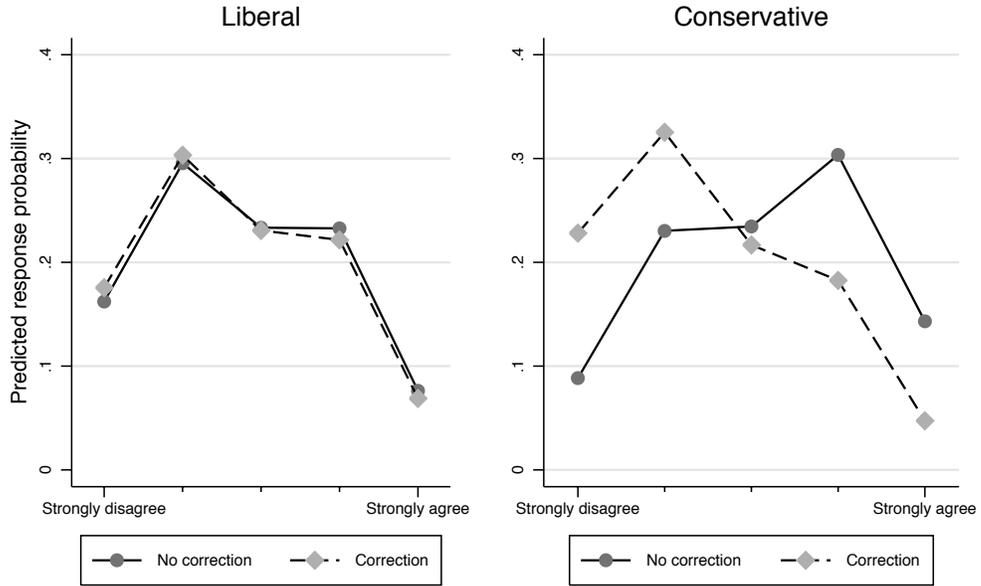


Figure 8

Is stem cell research banned?  
Predicted opinion: Spring 2006



**Table 1 – Ordered probit models of WMD misperception (fall 2005)**

	<b>Model 1</b>	<b>Model 2</b>
Correction	0.050 (0.193)	0.199 (0.201)
Ideology	0.358*** (0.068)	0.221*** (0.084)
Political knowledge	-1.138*** (0.376)	-1.122*** (0.377)
Mortality salience	0.278 (0.194)	0.275 (0.195)
Correction * ideology		0.367*** (0.136)
(Cutpoint 1)	-1.392*** (0.346)	-1.373*** (0.347)
(Cutpoint 2)	-0.739** (0.336)	-0.699** (0.338)
(Cutpoint 3)	-0.029 (0.334)	0.048 (0.337)
(Cutpoint 4)	1.377*** (0.386)	1.509*** (0.393)
Log-likelihood	-172.24	-168.59
N	130	130

\*  $p < .10$ , \*\*  $p < .05$ , \*\*\*  $p < .01$

**Table 2 – Ordered probit models of WMD misperception (spring 2006)**

	<b>Model 1</b>	<b>Model 2</b>	<b>Model 3</b>
Correction	-0.069 (0.159)	-0.141 (0.162)	-0.159 (0.177)
Ideology	0.356*** (0.053)	0.487*** (0.074)	0.525*** (0.078)
Political knowledge	-1.287*** (0.325)	-1.247*** (0.327)	-1.290*** (0.335)
Correction * ideology		-0.270*** (0.104)	-0.389*** (0.112)
Iraq most important			-0.346 (0.324)
Correction * most important			0.405 (0.455)
Ideology * most important			-0.304 (0.237)
Correction * ideology * most important			0.797** (0.321)
(Cutpoint 1)	-1.628*** (0.296)	-1.659*** (0.297)	-1.767*** (0.318)
(Cutpoint 2)	-0.961*** (0.285)	-0.985*** (0.286)	-1.074*** (0.307)
(Cutpoint 3)	-0.269 (0.280)	-0.278 (0.281)	-0.344 (0.301)
(Cutpoint 4)	0.910*** (0.306)	0.973*** (0.311)	0.935*** (0.327)
Log-likelihood	-255.59	-252.17	-248.06
N	195	195	195

\*  $p < .10$ , \*\*  $p < .05$ , \*\*\*  $p < .01$

**Table 3 – Ordered probit models of tax cut/revenue misperception (spring 2006)**

	<b>Model 1</b>	<b>Model 2</b>
Correction	0.096 (0.152)	0.176 (0.157)
Ideology	0.180*** (0.049)	0.070 (0.071)
Political knowledge	-0.634** (0.317)	-0.596* (0.318)
Correction * ideology		0.210** (0.097)
(Cutpoint 1)	-1.959*** (0.305)	-1.919*** (0.306)
(Cutpoint 2)	-1.128*** (0.288)	-1.076*** (0.290)
(Cutpoint 3)	-0.141 (0.282)	-0.071 (0.284)
(Cutpoint 4)	1.230*** (0.299)	1.312*** (0.301)
Log-likelihood	-265.5	-263.18
N	195	195

\*  $p < .10$ , \*\*  $p < .05$ , \*\*\*  $p < .01$

**Table 4 – Ordered probit models of stem cell ban misperception (spring 2006)**

	<b>Model 1</b>	<b>Model 2</b>
Correction	-0.276*	-0.329**
	(0.151)	(0.156)
Ideology	0.027	0.091
	(0.048)	(0.066)
Political knowledge	-0.578*	-0.555*
	(0.311)	(0.312)
Correction * ideology		-0.138
		(0.096)
(Cutpoint 1)	-1.590***	-1.607***
	(0.288)	(0.288)
(Cutpoint 2)	-0.712***	-0.728***
	(0.275)	(0.275)
(Cutpoint 3)	-0.112	-0.123
	(0.272)	(0.272)
(Cutpoint 4)	0.810***	0.809***
	(0.282)	(0.282)
Log-likelihood	-296.65	-295.62
N	195	195

\*  $p < .10$ , \*\*  $p < .05$ , \*\*\*  $p < .01$