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This paper explores a technique for mitigating framing effects in perceptions of global climate change. People's opinions on issues ranging from same sex marriage and the environment to free speech and health care have been shown to be influenced by the way in which the issue is presented: the metaphors, images, and catchphrases that communicate implicit normative messages about the issue. The work described here synthesizes insights from experimental research on moderators of framing effects and sociological research on frame reflection. Based on this synthesis, this paper describes a test of a simple highlighting technique for focusing respondents' attention on the framing operating in political materials. Results suggest that this intervention not only can reduce the opinion-shaping impact of frames but may also reduce ideological polarization. Implications include a better understanding of the mechanisms by which frames operate, techniques for making frame reflection possible among political non-elites, and recommendations for strengthening environmental groups' public communication strategies.

Keywords: *framing effects; climate change; global warming; frame reflection*

Introduction

Research has established that the framing of political issues can have significant impact on perceptions of, and prescriptions for addressing, those issues. Often, differences of framing come down to very specific word choices, such as "estate tax" vs. "death tax,"

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"homosexual marriage" vs. "gay civil unions" (Price, Nir, & Cappella, 2005), or "forbid" vs. "not allow" (Rugg, 1941). Framing impacts perceptions of environmental issues (Hart & Nisbet, 2012; Maibach, Nisbet, Baldwin, Akerlof, & Diao, 2010; Nisbet, 2009; Schuldt, Konrath, & Schwarz, 2011). For example, Americans think very differently about the merits of oil drilling if the issue is framed in terms of America's dependence on foreign sources of energy rather than in terms of the economic costs of the country's failure to develop new energy sources (Zaller & Feldman, 1992). This work suggests that political elites can use frames to manipulate public opinion (Nelson & Kinder, 1996). However, significant prior work has identified a variety of moderators and mediators of framing effects (Borah, 2011; Chong & Druckman, 2007a; Druckman, 2001; Druckman & Nelson, 2003). In other words, frames shape opinion only under certain conditions. Identifying these conditions is important to understanding the mechanisms by which framing operates.

Prior work has explored mitigating frame bias in decision-making that involves risk assessment and cost-benefit analysis (Kahneman & Tversky, 1979, 1984; Tversky & Kahneman, 1981), such as deciding whether to undergo an experimental medical procedure, using various techniques, such as providing justifications (e.g. Hodgkinson, Bown, Maule, Glaister, & Pearman, 1999; Hodgkinson, Maule, Bown, Pearman, & Glaister, 2002; LeBoeuf & Shafir, 2003; Quattrone & Tversky, 1988; Smith & Levin, 1996; Wright & Goodwin, 2002). Another body of work has explored moderators that can reduce framing effects in opinion formation, such as group discussion of the issues and exposure to competing frames (Chong & Druckman, 2007a; Druckman, Fein, & Leeper, 2012; Druckman & Nelson, 2003; Smith & Levin, 1996; Sniderman & Levendusky, 2007; Sniderman & Theriault, 2004). However, both kinds of moderators involve substantial demands on subjects' time and energy. Neither offers a clear way to stimulate more reflective consideration of controversial issues and more reflective public opinion about them (Fishkin, 1991, 1995).

This paper draws an alternative from the small literature on the use of *frame reflection* in policy disputes. Frame reflection involves scrutinizing and evaluating the frames underpinning positions on controversial issues (Schön & Rein, 1994). While it has often been operationalized in ways that are quite demanding on research participants, such as via lengthy discussion moderated by a professional facilitator (Runhaar, 2009; Runhaar, Runhaar, & Oegema, 2010), frame reflection *can* be operationalized in ways that are less demanding. If the goal is to alert subjects that a frame is operating, this may be accomplished relatively quickly and easily by drawing subjects' attention to the words that instantiate the frame. Doing so may be enough to mitigate the opinion-shaping effects of the frame. If so, then such framing effects likely occur via heuristic processes that become replaced by more conscious, deliberate mental processing when attention is drawn to the frame.

We test this proposition with an experiment. Previous work found that subjects expressed greater belief in the existence of "climate change" than in the existence of "global warming." This effect occurred especially among self-identified Republicans (Schuldt et al., 2011). Our study used this same question, but, for some subjects, we described the concept of framing and highlighted the relevant terms (e.g. "global

warming" or "climate change"). Our findings suggest that simply drawing attention to framing can reduce the framing effects documented in previous work. This result applies both to belief in the existence of the phenomenon and to responsibility for its treatment. We use these findings to shed light on the mechanisms by which framings of global climate change impact opinions.

Theoretical Development: Framing and the Moderation of Framing Effects

Prior work has found that, among other factors, both political ideology and education level predict opinion on global climate change. Those who self-identify as liberals or Democrats express greater concern about, and stronger support for measures to address, climate change (Hamilton, 2011; McCright & Dunlap, 2011; Schuldt et al., 2011). Education also has significant effects, but those effects are mediated by ideology. Among Democrats and liberals, higher levels of educational attainment predict greater environmental concern. However, among Republicans and conservatives, the effect is the opposite: higher levels of education predict *decreased* environmental concern (Hamilton, 2011; McCright & Dunlap, 2011). In sum, evidence indicates increasing partisan politicization and polarization on the issue of global climate change (Hart & Nisbet, 2012).

Environmental opinions and perceptions depend not only on individual traits, but also on framing (Nisbet, 2009). Hart (2011) found that thematic framings of climate change, in which the issue was portrayed as pervasive, led to greater support for government action than did episodic framings, in which the focus was on single events. Maibach et al. (2010) argue that framing environmental issues in terms of public health can help reduce partisan polarization, though both Hart and Nisbet (2012) and Gollust, Lantz, and Ubel (2009) suggest that even the impacts of a public health framing may be mediated by political ideology. As noted above, Schuldt et al. (2011) found that when subjects were asked about their belief in "global warming" or "climate change," belief in "global warming" was significantly lower among self-identified Republicans.

However, several factors can moderate framing effects. Some of these are individual-level traits: proclivity for exerting cognitive effort, that is, need for cognition (Cacioppo & Petty, 1982; Smith & Levin, 1996); the strength of ideology or prior opinions (Brewer, 2001; Price et al., 2005); or levels of political knowledge (Brewer, 2003; Chong & Druckman, 2007a; Druckman & Nelson, 2003). Deliberate interventions may also moderate the impact of frames. For example, having subjects express a decision in terms of a canonical representation, such as a decision tree that shows the likelihood, costs, and benefits of each outcome, has been found to neutralize framing effects (Hodgkinson et al., 1999; Hodgkinson et al., 2002; Wright & Goodwin, 2002). Requiring participants to provide justifications for their decision can also counteract the effects of framing (Miller & Fagley, 1991; Sieck & Yates, 1997; Takemura, 1994). Both interventions seem to operate by shifting subjects from heuristic decision-making into more effortful, deliberate thinking.

For those interested in promoting more reflective opinion (Fishkin, 1991, 1995) about environmental issues, these findings are both suggestive and problematic. They are suggestive in pointing to the possibility of using deliberate interventions to reduce the effects of elite-produced frames. They are problematic, however, in several ways. First, findings on several moderators have been mixed. For example, provision of justifications does not consistently mitigate framing effects (LeBoeuf & Shafir, 2003). Second, the interventions just described demand considerable time and energy from subjects. Third, and most important, these interventions have been shown to mitigate the effects of *equivalence* frames, but public discourse tends to be dominated by *emphasis* frames.

Equivalence frames involve different but logically equivalent descriptions of the same phenomenon. For example, treatment plans for an outbreak of an "Asian disease" (Tversky & Kahneman, 1981) may be described in terms of the number of expected survivors or the number of expected casualties. The same package of ground beef can be described as either 25% fat or 75% lean, resulting in different perceptions of taste (Levin & Gaeth, 1988). Equivalence framing effects seem to operate at least partly via cognitive accessibility (Druckman, 2004; Levin, Schneider, & Gaeth, 1998; Nelson, Clawson, & Oxley, 1997). Different descriptions (percent lean vs. percent fat, survivors vs. casualties) render different aspects of the same situation more readily accessible and, therefore, weighted more heavily in the assessment and decision-making processes. This explains why more effortful thinking counteracts the effects of such frames.

However, *emphasis frames* seem to operate through different mechanisms. Emphasis frames call out one or another aspect of a situation as important. For example, discussion of a government program might emphasize either the costs of the program or its capacity to right a moral wrong. Emphasis frames do not function via cognitive accessibility (Druckman, 2004; Nelson et al., 1997) but rather by increasing the relative importance of different considerations. For example, Nelson et al. (1997) exposed subjects to information about a potential KKK rally framed in terms of either free speech or public order. Based on subjects' response times in discerning real words from "nonwords," such as "trud" or "flirp" (Fazio, 1990), framing had no impact on the cognitive accessibility of terms associated with free speech (e.g. "liberty") or with public order (e.g. "danger"). However, the framing that subjects saw did impact their assessment of the importance of various concerns associated with either free speech or public safety when deciding whether or not the rally should occur. Thus, interventions designed to foster more effortful thinking may not counteract the effect of emphasis frames (Druckman, 2004).

In addition to individual moderators described above, scholars have identified contextual moderators of emphasis framing effects, chiefly exposure to competing frames and exposure to cross-cutting conversation. Sniderman and Theriault (2004) argue that when people confront opposing sides of an issue simultaneously, the contrast in frames seems to drive people "home" to their bedrock political values. A majority of subjects in their study who favored equality over economic growth tended to oppose government spending when it was framed in terms of higher taxes. However, when

those egalitarians were exposed to both the higher taxes frame and one that linked government spending to helping people get ahead, the framing effect disappeared. Druckman and Nelson (2003) found that subjects who engaged in conversations after being exposed to a single frame were also more likely to express opinions that were in line with their political beliefs. However, the frame-moderating effect of interpersonal conversation operated only when conversation participants held diverging views. Again, it seemed that exposure to opposing frames reminded subjects of their own (unframed) beliefs (Druckman & Nelson, 2003; Sniderman & Theriault, 2004).

Like the interventions described earlier, these, too, are suggestive but problematic. Exposure to competing frames moderates emphasis frames' impacts but, according to Chong and Druckman (2007b), only when the frames are equal in strength. Providing such frames is likely difficult. Moreover, even when exposure to competing emphasis frames works, it simply leads subjects to revert to their unframed opinions. Druckman and Nelson (2003) ask rightly, though, whether unframed opinions are necessarily better ones.

An alternative: frame reflection

We can draw an alternative perspective from a literature that has treated frames less as the source of bias and more as clusters of assumptions that underpin positions on policy issues (Rein & Schön, 1996; Runhaar, 2009; Runhaar et al., 2010; Schön & Rein, 1994). Since frames are ubiquitous, and indeed in some ways useful, it makes sense not to try to eliminate frames in favor of something more closely resembling objective information but rather to raise frames to individuals' awareness and scrutiny. Rein and Schön describe the concept of *frame reflection*, wherein "assumptions, views of the world, and values that have heretofore remained in the background, giving shape to foreground inquiry but keeping, as it were to the shadows, become foreground issues, open to discussion and inquiry in their own right" (Rein & Schön, 1996, p. 94). Frame reflection rests on what Rein and Schön (1996, p. 88) call "multiplism:" the fact that issues can be seen from multiple perspectives, each of which implies different beliefs about the prevalence and severity of the issue, its causes, the best way to address the issue, and the institutions properly responsible for doing so.

Frame reflection seems, then, to be a form of effortful thinking. Close scrutiny of assumptions, world views, and value commitments resembles the deliberate thinking involved in justification provision (Miller & Fagley, 1991). This close scrutiny may result in either reinforcement of those underlying commitments, questioning of those commitments, adoption of new commitments, or some combination thereof. As a result, subjects should reaffirm some of their prior beliefs but move away from others. This dynamic thus differs from that of exposure to competing views. Frame reflection's more deliberative character may lead subjects not back to their unframed opinions, but rather to new, and possibly less polarized, opinions.

Prior research on frame reflection, however, has focused primarily on intractable policy disputes among elite stakeholders (see Runhaar et al., 2010 for a review).

These cases involve a mediator helping stakeholders identify the frames underpinning their positions and consider alternatives. These stakeholders have expertise, motivation to pay attention, a professional mediator's assistance, and a stake in coming to some agreement. None of these things are true of ordinary citizens.

Is there, then, a way to encourage frame reflection among people who are likely both reluctant to commit much time and energy to considering political issues and suspicious of efforts to probe their unscrutinized assumptions? Perhaps simply drawing attention to the concept of framing and its role in shaping opinions may be enough to trigger the multiplism associated with frame reflection. In a related context, Bless and Schwarz (2010) describe what they call an "aboutness" filter, which essentially asks "is this [information] coming to mind because it is my response to the target [situation or object being assessed] or is it merely brought to mind by some irrelevant influence?" (Bless & Schwarz, 2010, pp. 330–331). In one study, participants interviewed on rainy days consistently rated themselves as less happy and less satisfied with their lives than those interviewed on sunny days. However, when participants' attention was drawn to potential (priming) relationships between weather and mood, or even simply to the fact that it was raining, no such differences emerged (Schwarz & Clore, 1983). That is, when participants were given the chance to attribute their momentary disposition to external factors, they developed more consistent ratings of their overall affective state.

However, increasing self-awareness alone may not mitigate the influence of such factors. For example, participants who are made aware of a prime may still be subject to priming effects if they see that prime as part of their own spontaneous reaction (Strack, Schwarz, Bless, Kübler, & Wänke, 1993), such as if the prime occurs through an answer to a previous question on a survey (Schwarz, 1996). "What is crucial is not awareness *per se*, but awareness of an unwanted influence" (Bless & Schwarz, 2010, p. 333). We suggest that by drawing attention to the specific language that invokes a frame, people may attribute their momentary feelings to that language, seeing it as an unwanted or irrelevant influence, thereby mitigating the framing effect of that specific language.

Testing frame reflection's moderating potential

The dynamics of frame reflection may thus moderate framing effects without the time and energy required by other techniques. Crucially, we argue, one need not specify *how* a term is connected to a particular frame. Simply drawing attention to possible evidence of a frame may suffice.

One place to test such an intervention is in the context of environmental issues, where perceptions are often subject to framing effects (Hart, 2011; Hart & Nisbet, 2012; Maibach et al., 2010; Nisbet, 2009). Here, we focus on an effect identified by Schuldt et al. (2011), wherein self-identified Republicans were less likely to believe in "global warming" than in "climate change." This effect may stem from "'global warming' entail[ing] a directional prediction of rising temperatures that is easily discredited by any cold spell" (Schuldt et al., 2011, p. 122).

We suggest that global warming vs. climate change is an example of emphasis framing, for two reasons. First, even though "in public discourse […] the terms tend to be often used interchangeably" (Hamilton, 2011, p. 233; also see Schuldt et al., 2011), the two concepts are not logically equivalent (Hamilton, 2011; Schuldt et al., 2011), as is required for equivalence frames (Druckman, 2001; Levin et al., 1998). Global warming involves a trend of increasing average surface-level temperatures. Climate change, in contrast, refers to complex phenomena that arise from an overall warming trend but include other climatic occurrences, even unseasonable cold (Schuldt & Roh, 2014). Second, the global warming framing works by shifting our perception of what information is important. Whitmarsh (2009) argues that global warming implies a greater degree of human causation. Climate change, even though it refers technically to a broader set of phenomena than global warming, *seems* more neutral. In other words, choosing between the two terms is not simply a matter of what to call the phenomenon but rather what moral message one wants to convey (cf. Perrin & McFarland, 2011). The labels "global warming" and "climate change" reflect different ways of thinking about the environment and thus invoke different framings.

The question, then, is what happens when one calls attention to those framings. We suggest three possible outcomes. First, there may be no effect, in which case subjects' opinions about the existence of global warming/climate change would be the same as without an intervention. Second, calling attention to framing may have the same effect as providing both competing frames, in which case subjects' opinions after the intervention would be consistent with their prior ideological beliefs (Chong & Druckman, 2007a; Druckman et al., 2012; Druckman & Nelson, 2003; Sniderman & Theriault, 2004). That is, conservatives across both framing conditions would espouse consistently *lower* belief in global climate change (Hamilton, 2011; McCright & Dunlap, 2011). Third, drawing attention to framing may encourage frame reflection, in which case subjects may question their prior ideological beliefs. That is, conservatives across both framing conditions would espouse consistently *higher* belief in global climate change.

Framing may also impact aspects of opinion beyond belief. Specifically, subjects' attribution of responsibility to the government for addressing global climate change may also be subject to framing effects, since framing deals, in part, with the entities and institutions responsible for an issue (Hart, 2011; Hart & Nisbet, 2012; Iyengar, 1990; Rein & Schön, 1996; Schön & Rein, 1994). Since "global warming" connotes more human causation than "climate change" (Whitmarsh, 2009), government action to address global warming would likely result in policies directed toward those causal human actions, and conservatives generally oppose "big government" regulation of daily life (Feldman & Zaller, 1992). On the other hand, government action to address climate change, which is more associated with natural causes (Whitmarsh, 2009), would likely involve disaster preparedness, infrastructure fortification, and similar activities that involve less regulatory intervention (cf. Schuldt & Roh, 2014). Thus, we expect conservatives to attribute more

treatment responsibility to the government for "climate change" than for "global warming."

Hypotheses

Synthesizing the above discussion, we articulate the following hypotheses. H1 and H2 replicate prior findings; H3 represents a novel contribution.

> H1—Self-identified conservatives will express significantly less belief in the existence of "global warming" than in the existence of "climate change" (cf. Schuldt et al., 2011).

> H2—Self-identified conservatives will attribute less responsibility to the government for addressing "global warming" than for addressing "climate change" (cf. Hart, 2011).

> H3—Drawing attention to frame-invoking language will (a) moderate framing effects (b) without increasing partisan polarization. In other words, when engaged in frame reflection, self-identified conservatives in the "global warming" condition who receive the highlighting intervention will be more likely to express belief in the existence of the phenomenon and more likely to attribute treatment responsibility to the government.

The Study

Methods

This study tests a simple highlighting intervention, wherein participants are alerted to the concept of framing and see key terms highlighted in a brief discussion of the issue to encourage frame reflection (Schön & Rein, 1994) as a potential moderator of framing effects. Importantly, this intervention does not involve calling attention to the fact that the language has been altered in different versions of the question. Participants only know of the one variant of the question they see, that is, they are exposed to a single framing. The highlighting thus draws attention not to the experimental manipulation but to the framing per se. Study participants were asked to complete an opinion survey that used a 2×2 experimental design. The first manipulation involved changing the text prefacing the survey questions. The control condition used language stating that the purpose of the survey was to understand opinions about political issues:

> Political issues can often be complex, contentious, and difficult to understand.

> One way of making sense of these issues, and the different positions that one can take on an issue, is to ask about the different opinions that people have on those issues.

Participants in the experimental highlighting condition read a prompt that introduced and explained the concept of framing:

> Political issues can often be complex, contentious, and difficult to understand.

> One way of making sense of these issues, and the different positions that one can take on an issue, is to think about the frames that structure debate about the issue. Frames help organize facts and information. They help define what counts as a problem, diagnose the problem's causes, and suggest remedies for solving the problem. These ways of thinking have lots of different parts, including stereotypes, metaphors, images, catchphrases, and other elements.

> Different framings are often associated with a particular way of talking about or communicating about an issue. In the following questions, words or phrases that might indicate different framings have been highlighted.

The second manipulation replicated Schuldt et al.'s (2011) "global warming" framing vs. "climate change" framing. All participants read the following question, with the text in angle brackets changed in each condition:

> You may have heard about the idea that the world's temperature may have been <going up/changing> over the past 100 years, a phenomenon sometimes called <global warming/climate change>. What is your personal opinion regarding whether or not this has been happening?

For participants in the highlighting condition, the phrases "going up" or "changing" and the phrases "global warming" or "climate change" were highlighted.

Participants were recruited via Amazon's Mechanical Turk service to participate in an opinion survey. Each participant was paid $0.65 to complete the survey. Admittedly, this approach does not provide a representative sample. However, we are less interested in accurately assessing popular opinion than in causal hypothesis testing, so this sampling method suffices. See the "Limitations" portion of the "Discussion" section for more on this point and (Berinsky, Huber, & Lenz, 2012; Paolacci, Chandler, & Stern, 2010) for further discussion of the validity and representivity of this recruitment approach.

Framing manipulation measures

The experiment involved two primary response variables. First, respondents indicated whether they believed in the existence of either global warming or climate change, depending on their framing condition. Belief was indicated on the same 7-point scale Schuldt et al. (2011) used, from "Definitely *has not been* happening" to "Definitely *has been* happening." Second, we asked subjects to indicate how much responsibility (cf. Hart, 2011; Hart & Nisbet, 2012), on a 7-point scale from "no responsibility" to "a great deal of responsibility," each of three groups should have in addressing climate change: the US government, governments of other countries, and "people like me." Due to our interest in support for government policies to address climate change, the analysis focuses on attribution of responsibility to the US government.

Other measures

First, respondents identified their political ideology on a seven-point scale from "very conservative" to "very liberal." Respondents also indicated if they were a member of a party or, if not a member, the party for which they most often voted.

Second, respondents listed the initials of up to four individuals with whom they regularly discuss politics. For each individual listed, respondents indicated the number of days in the past week they discussed politics with that person and how often they disagreed (cf. Cappella, Price, & Nir, 2002).

Third, respondents indicated the highest level of education they had attained on a 7-point scale: less than eighth grade, some high school, high school graduate, some college but no degree, associate's degree, bachelor's degree, or graduate degree.

Finally, the survey included a measure of political knowledge (adapted from Mondak, 1999) with 14 questions, each marked as correct (1) or incorrect (0). Responses were averaged to create a scale from zero to one. These questions also served as validation to ensure that Mechanical Turk workers were not providing nonsensical answers and were not bots or automated scripts.

Respondents

We recruited a total of 303 respondents. Responses with only one or zero correct answers to the political knowledge questions were reviewed both for answers and for completion time to ensure that the respondent was paying attention to the survey tasks. Seven responses were thusly reviewed, and two were removed (both spent fewer than two minutes on the entire survey).

Schuldt et al. (2011) use party affiliation for their analysis, but many of our respondents listed their party affiliation as "libertarian," "independent," "tea party," or something else besides Democratic or Republican. Thus, we instead use respondents' ideological self-identification on the 7-point conservative-to-liberal scale. This analysis uses respondents who identified either as liberal or conservative, that is, it excludes self-identified "centrists." This leaves us with 122 respondents in the control condition and 126 in the highlighting condition, for a total of $N = 248$ for the main analysis.

Our respondents included 96 females, 151 males, and one "agender" individual. They ranged in age from 18 to 68 ($M = 33.76$). The sample leaned liberal, with 69 conservative and 179 liberal respondents. The sample was also moderately more well educated than the US population.[1] Most respondents had either a bachelor's (40.7%) or graduate (6.9%) degree, while others had either an associate's degree (10.4%) or some college without a degree (27.4%). Only 14.5% had a high school education or less. Similar to McCright and Dunlap (2011), we recoded this variable to represent whether or not the respondent had completed college, that is, held a bachelor's or graduate degree.

Compared with Cappella et al. (2002), who used the same measure of political discussions, our sample was somewhat more engaged. Totaled across up to four friends, our respondents discussed politics in the week preceding our survey anywhere from once (one day of discussion with a single friend) to 28 times (discussions every day of the week with each of four friends) ($M = 8.0$). Disagreements occurred in those discussions with moderate frequency ($M = 9.0$, on a

Table 1. Two-way ANOVA on belief demonstrating the impact of respondents' ideology and its interaction with framing in the control condition.

	Df	*F*-value	*p*-Value
Framing	1	0.03	.86
Ideology	1	45.44	<.001***
Framing × Ideology	1	4.41	.04*

Note: *p < .05, **p < .01, ***p < .001.

total scale of 1–20). On a scale of 0–1, political knowledge scores ranged from 0.07 to 1.0 (*M* = 0.60).

Results

In the control condition, that is, with no mention of frames or frame highlighting, conservatives espoused greater belief in climate change than in global warming (H1). Only 42.9% of conservatives reported belief in global warming, that is, reporting a value of 5 or higher on the belief scale, while 63.2% of conservatives reported believing in climate change. These results resemble very closely the proportions from previous work (Schuldt et al., 2011), as well as those found in a subsequent nationally representative sample (Schuldt, Roh, & Schwarz, n.d.). Indeed, a two-way ANOVA on belief in only the control condition shows a significant main effect for ideology and a significant interaction between ideology and framing (Table 1; in all results *p < .05, **p < .01, ***p < .001). Thus, we confirm H1 and replicate Schuldt et al.'s (2011) findings.

Second, as expected, self-identified conservatives attributed less responsibility to the government for addressing "global warming" than for addressing "climate change" (H2). A two-way ANOVA on government responsibility in the control condition shows a significant main effect for ideology and a significant interaction between ideology and framing (Table 2), just as with belief. Thus, the results confirm H2.

We expected that drawing attention to framing by highlighting the language involved would encourage frame reflection and act to moderate framing effects without increasing partisan polarization (H3). First, we test this hypothesis in the context of belief in global climate change. A three-way ANOVA across both the control and the experimental highlighting conditions shows that the main effect for Ideology persists ($F_{1,240} = 60.89$, $p < .001$) but the framing effect is no longer

Table 2. Two-way ANOVA on government responsibility demonstrating the impact of respondents' ideology and its interaction with framing in the control condition.

	Df	*F*-value	*p*-Value
Framing	1	0.01	.93
Ideology	1	68.62	<.001***
Framing × Ideology	1	5.67	.02*

Note: *p < .05, **p < .01, ***p < .001.

Table 3. Three-way ANOVA for the impacts of framing, manipulation highlighting, and ideology on belief in global climate change.

	Df	*F*-value	*p*-Value
Framing	1	0.08	.78
Ideology	1	60.89	<.001***
Highlighting	1	2.04	.15
Framing × Ideology	1	0.03	.86
Framing × Highlighting	1	0.19	.66
Ideology × Highlighting	1	3.31	.07
Framing × Ideology × Highlighting	1	6.36	.01*

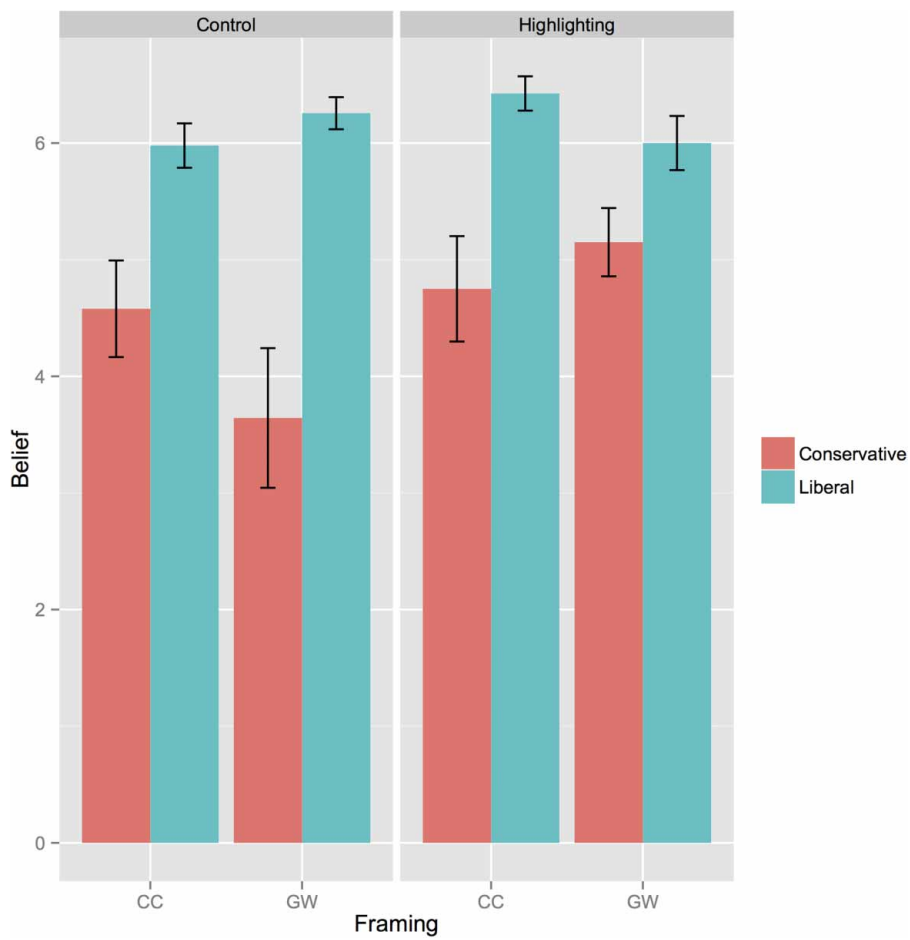Note: $^*p < .05$, $^{**}p < .01$, $^{***}p < .001$.

Figure 1. Belief in global climate change as a function of framing, ideology, and highlighting intervention. Highlighting the frame eliminates the framing effect.

Table 4. Three-way ANOVA for the impacts of framing, manipulation highlighting, and ideology on government responsibility for addressing global climate change.

	Df	*F*-value	*p*-Value
Framing	1	1.15	.29
Ideology	1	92.71	<.001***
Highlighting	1	0.87	.49
Framing × Ideology	1	2.59	.11
Framing × Highlighting	1	0.97	.33
Ideology × Highlighting	1	4.37	.04*
Framing × Ideology × Highlighting	1	2.05	.15

Note: *p < .05, **p < .01, ***p < .001.

statistically significant (Table 3). Furthermore, we see a significant interaction between framing, the highlighting, and ideology ($F_{1,240} = 6.36$, $p = .01$). A post hoc test using Tukey's HSD shows that conservatives were significantly more likely to believe in global warming in the highlighting condition than in the control condition ($M_2 - M_1 = 1.6$, $p = .05$) (Figure 1). To consider the magnitude of this moderating effect, we can compare average belief in the different conditions. In the control condition, conservative belief in global warming averaged 3.82 on a scale of 1–7 and liberal belief in climate change averaged 4.59, a difference of 0.77. Compare this with the highlighting condition, where conservative belief in global warming averaged 5.31 and in climate change 5.36, a difference of only 0.05. In essence, *drawing attention to the framing* by highlighting it *almost entirely eliminates the framing effect*. This effect also holds when controlling for respondents' political knowledge, the frequency with which they discussed political issues, and education level. Furthermore, the effect of the highlighting occurs without conservatives becoming more polarized. Conservatives' levels of belief in the highlighting condition are on par with those for the climate change framing in the control condition, which, as noted above, is higher than for the global warming framing.

We can also test H3 in the context of government responsibility. Again, a three-way ANOVA shows that a main effect for ideology still holds but that the framing effect is no longer significant (Table 4). Furthermore, we see a significant interaction between the experimental condition and ideology. Conservatives who saw the framing highlighted attributed more treatment responsibility to the government regardless of framing (Figure 2). This result, combined with those about belief, confirms H3. We see that highlighting framing moderates—indeed, nearly eliminates—the framing effect without increasing polarization between conservatives and liberals.

Discussion

The findings presented here make three primary contributions. First, examining the moderators of framing effects helps deepen our understanding of the mechanisms
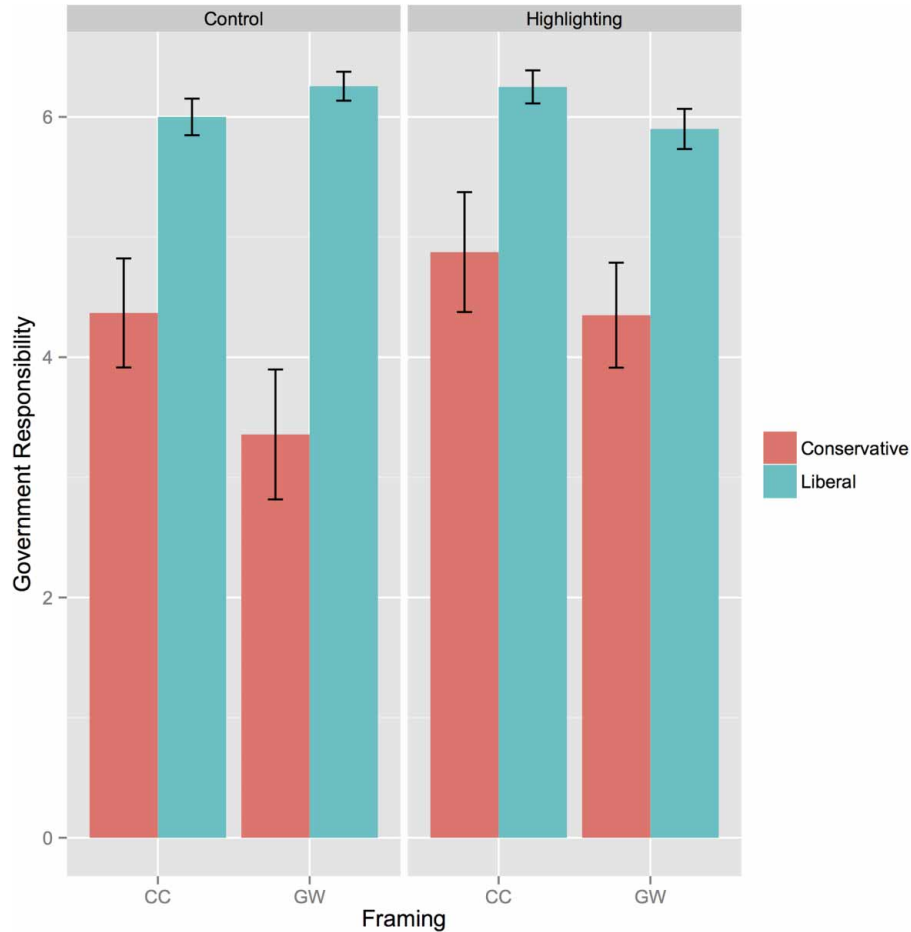
Figure 2. Government treatment responsibility for global climate change as a function of framing, ideology, and highlighting intervention. Highlighting the framing results in greater government treatment responsibility among conservatives, regardless of framing.

by which those effects operate. Second, our results show how frame reflection can be made more practically tenable, especially among the non-elite public. Third, the findings here suggest some potential strategies for incorporating frame reflection into public deliberation. Throughout, we consider limitations and how they could be addressed in future work.

Mechanisms and moderators of framing

We expect that inducing deliberate attention to framing would moderate equivalence framing effects (Druckman, 2001; Druckman & Nelson, 2003; Hodgkinson et al., 1999; Hodgkinson et al., 2002; Nelson et al., 1997; Wright & Goodwin, 2002). Druckman

suggests that these kinds of interventions should *not* moderate emphasis frames (which he calls "issue frames"). "[C]onscious weighting of alternative considerations […] can still sensibly lead one to endorse one of those considerations […], i.e. issue framing effects can still occur" (Druckman, 2004, p. 674). However, our results show that such effects did *not* occur. Future work should examine more closely potential moderating relationships between different forms of deliberate thinking and emphasis framing effects. For example, would simply exhorting participants to attend to framing, without highlighting specific words, produce the same frame reflective effects? While our study did not include attention checks, correct answers to the political knowledge questions suggest some degree of sustained attention. Also, response times to the opinion questions were slightly faster for respondents in the control condition ($M = 113.1$s, SD = 90.1s) than in the highlighting condition ($M = 123.8$s, SD = 97.0s) but not significantly so (Mann–Whitney U-test, $p = .50$). Thus, we believe it unlikely that experimental participants are simply thinking longer and harder about the questions.

Prior work has also shown that both discussions of an issue among groups with heterogeneous views (Druckman & Nelson, 2003; Price et al., 2005) and exposure to counter-frames can moderate the effects of emphasis frames (Chong & Druckman, 2007a; Druckman et al., 2012; Druckman & Nelson, 2003; Sniderman & Theriault, 2004). Both these moderators can suggest different perspectives. However, unlike these previously documented moderators, our highlighting intervention did not lead respondents "home" (cf. Sniderman & Theriault, 2004) to more polarized, partisan positions. In fact, we see the opposite—the highlighting intervention actually decreases the difference in opinions espoused by conservatives and liberals.

We suggest that an explanation for this result can be found in the details of Rein and Schön's (1996) account of multiplism, that is, that the same facts can be sensibly interpreted through (sometimes drastically) different perspectives. Crucial to frame reflection is acknowledging of the existence of such different perspectives. If subjects are engaging in frame reflection, at least two different cognitive mechanisms may be at work. First, when alerted that a frame is operating, subjects may be consciously considering alternative framings. These alternatives arise not from external sources, as with discussion and counter-framing, but are generated by the subject her- or himself. Perrin and McFarland suggest that emphasis framing provides a specific context for an issue, "and [subjects'] responses may have more to do with their opinions on that broad context than on the specific question" (Perrin & McFarland, 2011, p. 91). Highlighting the framing may enable subjects to bracket that context and thereby ease consideration of other possible contexts (i.e. framings). Second, subjects may simply be acknowledging the perspectiveness of the highlighted framing. That is, they need not necessarily explicitly consider other frames; perhaps acknowledging the possible existence of alternatives, and the concomitant contingence of the given frame, is enough to moderate the framing effect. Future work may be able to test this possibility, determining whether highlighting frame-instantiating language brings to mind alternative frames. Debriefing interviews with participants may be especially effective in unpacking the processes of frame reflection among non-experts.

However, this point also raises the question of whether frame reflection does, in fact, occur as a result of highlighting the frame.

The practicality of frame reflection

The value of frame reflection comes largely from its potential to resolve seemingly irreconcilable policy controversies. For example, a 1980s controversy over the homeless in Massachusetts was reconciled only when the three dominant frames—social welfare, access to the housing market, and social control—were replaced with a new framing that synthesized elements from each (Schön & Rein, 1994). Such previous studies of frame reflection (see also Runhaar, 2009; Runhaar et al., 2010), though, focus primarily on elites engaged in policy debates. Ours is, to our knowledge, the first study to provide evidence suggesting that frame reflection can be facilitated among lay members of the public with relatively little additional demands on their time or commitment to the issue.

We do not know with absolute certainty, though, that subjects engaged in frame reflection. Indeed, we know very little about "the anatomy of situated frame reflection" (Rein & Schön, 1996, p. 95; Runhaar et al., 2010, p. 341). What we do know is that the highlighting intervention moderated the framing effect without creating polarization, and that the multiplism of frame reflection provides a reasonable explanatory account for that effect. If frame reflection is indeed occurring, such interventions may represent a powerful means for addressing the increasing polarization on the issue of global climate change (Hamilton, 2011; McCright & Dunlap, 2011).

Frame reflective deliberation

In the last 15 years, organized public forums for discussing issues of public concern have proliferated (Lee, 2014; Leighninger, 2006). Such forums take a variety of formats (e.g. Deliberative Polls, citizen assemblies, citizen juries, twenty-first century Town Meetings, and consensus conferences) and address issues ranging from police-community relations to health care to the federal deficit. Common to all, however, is the belief that giving ordinary citizens the opportunity to discuss issues of mutual concern will make for better policy and a more informed citizenry (Cohen & Sabel, 1997; Fishkin, 1991, 1995). Public deliberation is thus seen by its proponents as a valuable counter to elite framing efforts (Kadlec & Friedman, 2007). Indeed, as noted above, Druckman and Nelson (2003) found that group conversation diminished framing effects, but only when the conversation involved people with conflicting perspectives. Ensuring the presence of conflicting perspectives is difficult, both because of the logistical challenges of knowing participants' perspectives in advance, and because people are often reluctant to express opinions that might lead to an uncomfortable argument (Black, 2012).

This means that one particular frame may dominate group discussion in a deliberative forum: either a frame promoted by a dominant participant or one inadvertently promoted by forum organizers (Barisione, 2012). The alternative suggested

by our findings is that simply highlighting key terms in background materials given to forum participants may diminish framing effects. Doing so should alert participants to the term's contested status, allowing them to hold in mind simultaneously the two associated competing frames. This possibility resonates with Goodin's (2000) argument that while good deliberation requires engaging different views, those views need not be embodied in real, live people. Instead, people can create deliberative situations in their imagination, pitting competing positions against each other and identifying the merits of each one. Our findings thus suggest an eminently practical way of encouraging people to do that imaginative work. Future research should investigate the value of such a strategy in a deliberative context.

Limitations and Future Work

As pointed out above, the data analyzed here do not come from a representative sample. Mechanical Turk workers lean liberal and, moreover, idealogical moderators do not always function the same among these workers as among other samples (Krupnikov & Levine, 2014). However, we suggest that our sampling method suffices for testing our causal hypotheses here. Furthermore, the effect size found for the impact of framing on belief in the existence of global climate change resembles very closely that found in previous research (Schuldt et al., 2011) and in a nationally representative sample (Schuldt et al., n.d.). That said, replication with a more representative sample would help ensure the generalizability of the highlighting intervention's effects.

Future work should also consider whether such an intervention would generalize to issues beyond global climate change. For example, opinions on abortion are fairly stable over time[2] and thus may be less susceptible than other issues to the effects of framing or frame reflection. Further studies could consider these questions not only for polling but also in persuasive contexts; does highlighting the framing in a persuasive message have a similar effect?

We should also note that while many frames are invoked via one or two key words, not all are so concisely instantiated. Lau and Schlesinger (2005) employed brief, one-paragraph statements describing different approaches based on different framings of health care. Druckman et al. (2012) used a collection of whole articles intended to invoke different frames. Gamson and Modigliani (1989) surveyed decades of media coverage to analyze the framing of nuclear power. Indeed, Entman (1993) might argue that, just as unframed facts do not exist, no word can be read without having at least some framing effect.

Herein lies a potential limitation. One might suggest that communication about highly contentious issues should be prefaced with an explanation of framing and should highlight the specific words related to the framing of the issue(s) in question. Indeed, the demonstrated efficacy of manipulations that only change a few words within a prompt (e.g. Price et al., 2005; Rugg, 1941; Schuldt et al., 2011) suggests that some words may instantiate framing more strongly than others. The difficult question becomes, then, which words should be highlighted? Definitions of framing

are many and varied (Druckman, 2001; Entman, 1993; Gamson & Modigliani, 1989; Goffman, 1974), but "straightforward guidelines on how to identify (or even define more precisely) a frame in communication do not exist" (Chong & Druckman, 2007b, p. 106) (see also Benford, 1997; Entman, 1993). Furthermore, in a longer article, aspects such as the number of exemplars, the use of scientific authority, or even what details are omitted can invoke different frames, all of which may be difficult to isolate by highlighting specific word choices. Future work on determining what language relates most directly to framing can help address this challenge, both in survey prompts and in less constrained text formats, as well as test whether the high-lighting intervention tested here remains efficacious when more than one or two words or phrases are highlighted.

Conclusion

The framing of political issues has a well-demonstrated impact on perceptions of those issues and prescriptions for action, both generally (Borah, 2011; Chong & Druckman, 2007b) and with specific regard to environmental issues (Hart, 2011; Hart & Nisbet, 2012; Maibach et al., 2010; Nisbet, 2009; Schuldt et al., 2011). Some work has explored potential moderators, which often require time-consuming pre-questionnaire tasks (Chong & Druckman, 2007a; Druckman, 2004; Druckman & Nelson, 2003; Hodgkin-son et al., 1999; Miller & Fagley, 1991; Sieck & Yates, 1997; Takemura, 1994) or rather intrinsic attributes of respondents (Brewer, 2001, 2003; Druckman & Nelson, 2003; Price et al., 2005). This paper considers a relatively simple intervention that moderates previously documented framing effects in the context of global climate change (Schuldt et al., 2011).

   The results presented here show that highlighting the words and phrases related to framing can moderate, and in many cases eliminate, framing effects. These results suggest that the multiplism (Rein & Schön, 1996) associated with frame reflection (Schön & Rein, 1994) works to moderate the importance-shifting effects of emphasis framing without increasingly polarized reaffirmation of prior opinions. The results show that our intervention mitigates the framing effect not only for belief in the exist-ence of global climate change but also for government treatment responsibility therefor.

   These findings help understand the mechanisms by which emphasis framing func-tions. Furthermore, they suggest that a fairly simple intervention that highlights frame-invoking words may effectively encourage reflection on the framing of the issue. If applied in other contexts, such as public engagement by environmental organizations or public deliberative exercises, such an intervention may help ameliorate the increasing partisan polarization on global climate change (Hamilton, 2011; Hart & Nisbet, 2012; McCright & Dunlap, 2011). Determining which words to highlight, though, may not always be straightforward. Future work that attends to this question by investigating more closely exactly what language is most related to framing could provide invaluable tools to help understand framing effects and facilitate frame reflection.

Acknowledgements

Funding

Notes

1. See https://www.census.gov/hhes/socdemo/education/data/cps/2013/tables.html.
2. http://www.gallup.com/poll/1576/abortion.aspx?version=print

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