The Impact of Elite Frames and Motivated Reasoning on Beliefs in a Global Warming Conspiracy: The Promise and Limits of Trust

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Abstract: Given the potential attitudinal and behavioral impact of Anthropogenic Global Warming (AGW) conspiracy beliefs, it is important to understand their causes and moderators. Here, I engage two explanations for the variation in these beliefs: the first is the choice among elites to frame AGW using the phrase "global warming" (GW) as opposed to "climate change" (CC); the second is partisan motivated reasoning. I then develop a theory about the role of trust in moderating the impact of the two frames on AGW conspiracy beliefs. In the case of CC, which is perceived as less severe than GW (and is therefore less identity threatening among Republicans), I hypothesize that trust will moderate hoax beliefs among Republicans. In the case of GW, where the implications of existence beliefs have more unpleasant policy consequences, motivated reasoning will "win out," and trust will not moderate conspiracy endorsement among Republicans. Results from an original question framing experiment are consistent with my hypotheses. Whereas trust is a welcome commodity to those looking to persuade citizens to support AGW-ameliorating policies, it is not a cure-all, especially in the face of elite partisan cues that edify pre-existing attitudes/identities and arouse a strong desire to engage in motivated reasoning.

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Partisan conflict was not always the norm on climate policy (Ogden 1971). However, contemporary elite battles, with Republicans usually leading the opposition to Anthropogenic Global Warming (AGW) policies, demonstrate a heightening partisan polarization through both policy stances and rhetoric (Dunlap and McCright 2011; Fisher 2006; McCright and Dunlap 2010). Over the same period, American public opinion on many different aspects of the AGW challenge has become similarly polarized: Republicans have sustained a low level of concern and low support for government-led policy responses to AGW over the last two decades, while Democrats have consistently become more concerned and supportive of policy interventions over time (Dunlap et al. 2016; Whitmarsh 2011). Not only have concern and policy attitudes polarized, but contemporary political debate on AGW has also seen a rise in AGW conspiracy theories (CTs) (Boussalis and Coan 2016; Elsasser and Dunlap 2012; McCright and Dunlap 2010), primarily coming from the right (e.g., Smith and Leiserowitz 2012).

Conspiracies and misinformation are politically and socially significant (e.g., Nyhan and Reifler 2010; Oliver and Wood 2014; Uscinski and Parent 2014); the misinformation and conspiracies surrounding climate change are consequential for myriad reasons (e.g., Uscinski et al. 2017), namely the clear linkage between conspiracy theory belief and behaviors affecting the political system. For example, beliefs that AGW is a hoax are negatively correlated with proenvironmental behaviors (Jolley and Douglas 2014), create an environment where attempts at deliberation, negotiation, and action about AGW are increasingly difficult (Lewandowsky et al. 2015), and through elections, put into place a balance of representatives unwilling to address the challenge that climate change presents (Douglas and Sutton 2015).<sup>1</sup>

<sup>&</sup>lt;sup>1</sup> CTs are typically defined as "an effort to explain some event or practice by reference to the machinations of powerful people, who attempt to conceal their role" (Sunstein and Vermeule 2009, 205), or a "secret arrangement between two or more actors to usurp political or economic power, violate established rights, hoard vital secrets, or unlawfully alter government institutions" (Uscinski and Parent

Given the potential attitudinal and behavioral impact of belief in AGW CTs, it is important to understand the causes of such beliefs, as well as any potential moderators. Here, I engage two explanations—elite framing of the terms "global warming" (GW) as contrasted with "climate change" (CC) and partisan motivated reasoning—for the belief that AGW is a conspiracy or hoax. I then develop a theory about the moderating role of trust, not just in AGW conspiratorial ideation, but also across GW and CC frames.

#### Frank Luntz, Elite Framing, and the CC/GW Distinction

It is impossible to fully understand the causes of beliefs about the existence and/or seriousness of AGW without accounting for the different ways in which the AGW issue has been strategically framed by increasingly polarized political elites to affect attitudes (e.g., Leiserowitz et al. 2014; Schuldt et al. 2011). As such, the first explanation is elite driven partian polarization and framing (e.g., McCarty et al. 2006; Zaller 1992) on the issue of AGW (McCright and Dunlap 2011; Dunlap and McCright 2011).

In 2002, pollster and strategist Frank Luntz advised the Bush Administration to frame their discussion of AGW using the term "climate change" instead of "global warming." Luntz suggested this because CC was naturally occurring and therefore "less frightening." The logic behind Luntz's recommendation was to broaden the consensus in the public that climate change was not that big of a deal. In his strategy memo to Republican leaders, "Mr. Luntz urges that the climate change term be used instead of global warming because 'while global warming has catastrophic communications attached to it, climate change sounds a more controllable and less emotional challenge" (Lee 2003). The recommendation was based in part on the policy implications of the GW frame (the solution for which would be much stricter anti-pollution

<sup>(2014, 31)).</sup> Believing that AGW is a "hoax" fits the conceptual definition of a CT, as perpetrating a hoax (i.e., a deliberate falsehood) of this magnitude requires the coordinated, secret efforts of a large group of powerful people.

regulations that would affect businesses) versus CC (a naturally occurring fluctuation in temperature for which fewer, if any, policy fixes are needed). Thus, elite discourse conducted through the CC frame would be less likely to lead to division on the issue inside the Republican coalition, leading to fewer calls for policies antithetical to Republican values.

Political operatives like Luntz know that the framing of an issue matters because it clarifies and condenses the issue for the public (e.g., Nelson, Clawson, and Oxley 1997). In fact, framing experiments confirm Luntz's assertions (but see Dunlap 2014; Villar and Krosnick 2011). For example, compared to CC, people are more concerned and worried about GW (Whitmarsh 2009, Leiserowitz et al. 2014), believe that it is more tractable (Whitmarsh 2009), and are less likely to believe in its existence (Schuldt et al. 2011; Schuldt et al. 2015). *The Role of Partisanship and Motivated Reasoning in the AGW Discourse* 

The framing research described above, however, obscures the role that partisanship plays in the effect of strategic AGW framing on individuals' attitudes. *Partisan* framing is a conditioning factor in the delivery of information that directs reasoning about that information: party elites can polarize the discourse by structuring the frames around an issue (Slothuus 2010; Slothuus and de Vreese 2010). In fact, compared to CC, GW evokes stronger ratings of negative affect, greater worry, and greater perceptions of personal and family threat among Democrats than Republicans (Kraft, Lodge, and Taber 2015; Leiserowitz et al. 2014; Villar and Krosnick 2011). In contrast, the gap in the belief in the existence of GW versus CC is greater for Republicans than Democrats, with Republicans being more likely to deny the existence of GW than CC (Schuldt et al. 2011; Schuldt et al. 2015; but see Dunlap 2014). This pattern of responses is consistent with motivated reasoning: people will engage in reasoning processes such as selective-exposure, counter-arguing, and out-right denial in the face of identity-threatening or counterattitudinal information in order to protect, bolster, or defend their pre-existing attitudes and identities (Kunda 1990; Lodge and Taber 2013).

When it comes to the impact of AGW seriousness and existence beliefs on environmental attitudes and partisan identity, Republicans would be expected to be more likely to engage in motivated reasoning than Democrats. Specifically, Republicans are less supportive of proenvironment policies than Democrats (e.g., Dunlap et al 2016). As such, Republicans would be expected to engage in motivated AGW conspiracy endorsement to a greater extent than Democrats (e.g., Smith and Leiserowitz 2012), to protect their pre-existing (anti-) environmental policy attitudes.<sup>2</sup>

It also stands to reason that Republicans would be more sensitive to the differences between the GW and CC frames on conspiracy endorsement than Democrats. Given that GW evokes stronger feelings of worry, personal threat, and associations with severe weather, on average, than CC, belief in the existence of GW would have more severe environmental policy implications in the direction antithetical to Republicans' pre-existing policy attitudes. Consistent with this reasoning, Republicans are less likely to believe that GW, rather than CC, exists, whereas Democrats (for whom the policy and identity implications are more consonant with their pre-existing attachments and beliefs) do not distinguish between the two frames with regard to existence beliefs.<sup>3</sup> In summary, based on motivated reasoning, the "default" is that Republicans should be more likely than Democrats to believe that AGW is a hoax to bolster/protect their preexisting attitudes and identities. Moreover, this motivated reasoning among Republicans should be stronger when the CT is framed as GW than as CC, because GW is more identity-threatening to Republicans than CC.

<sup>&</sup>lt;sup>2</sup> Republicans indicate a greater belief that AGW is a hoax than Democrats—see Appendix A.

<sup>&</sup>lt;sup>3</sup> Republicans are more likely to believe that GW is a hoax than that CC is a hoax; there is no difference in hoax beliefs between the GW and CC frames for Democrats—see Appendix A.

Research has demonstrated that Democrats and Republicans alike are willing to suspend disbelief and endorse CTs on all sorts of topics in the service of identity and attitude protection, thus demonstrating the power of motivated reasoning (e.g., Miller, Saunders, and Farhart 2016). To believe that AGW is an elaborate hoax, for example, one must believe in a vast conspiracy of elected and appointed governmental officials, scientists, academics, and journalists all coordinating to perpetrate an elaborate lie for decades (e.g., see Grimes 2016 and Keeley 1999 on the viability of unwarranted conspiracy beliefs). If partisan motivated reasoning affects AGW conspiracy beliefs similar to how it affects endorsement in other CTs, is there anything that could moderate this process?

#### The Moderating Role of Generalized Trust in Motivated AGW Conspiracy Endorsement

Kunda (1990) argues that motivated reasoning ("directional reasoning" in her language) is not as ubiquitous as many contemporary scholars and observers perceive it to be: "People do not seem to be at liberty to conclude whatever they want to conclude merely because they want to... *They draw the desired conclusion only if they can muster up the evidence necessary to support it*" (1990, 482–83, italics added). In other words, people engage in a balancing act between wanting to protect and bolster their attitudes/identities, and wanting to maintain an "illusion of objectivity" (Kunda 1990, 483). In this article, I shine the spotlight on a heretofore underexamined factor that might moderate motivated reasoning, especially in the context of conspiracy endorsement—generalized trust (in people in general, the media, and politicians and other political actors).

Why trust? As Hetherington (1998) argues, trust is more than just an indicator of how much people like politicians, political institutions, and the like. Trust is an important political and social commodity. Interpersonal trust and trust in government are positively related to civic

engagement, and, thus, social capital (Brehm and Rahn 1997). Trust in government also fosters inter-party cooperation among political leaders (Hetherington and Rudolph 2015). Trust is also negatively correlated with conspiracy endorsement in general (Miller et al. 2016). Not only does conspiracy endorsement require some level of suspension of disbelief,<sup>4</sup> it also requires a low level of trust in people, the media, and political institutions to do, at best, the right thing (or, at the very least, to not engage in secret plots that involve lying to the public in perpetuity).

With regard to the AGW conspiracy theory specifically, I argue that Republicans who might otherwise be motivated to believe that AGW is an elaborate hoax (to protect their partisan identity or pre-existing policy attitudes) will be *less likely* to be able to "muster up the evidence necessary"<sup>5</sup> to do so if they *also* believe that people and political actors are trustworthy.

H1: Trust will moderate AGW hoax beliefs for Republicans (as trust increases, hoax beliefs will decrease). For Democrats, as trust increases, belief in the hoax will either also decrease or be unchanged (given the likely floor effect in hoax beliefs for Democrats).<sup>6</sup>

Miller et al.'s (2016) finding that trust moderates motivated conspiracy endorsement across a wide range of CTs implies that trust could be a "cure-all." But is trust powerful enough to mitigate conspiracy endorsement when the implications for pre-existing attitudes and identities are strong and salient? In other words, trust has promise as a mitigator of motivated conspiracy endorsement; does it also have limits?

<sup>&</sup>lt;sup>4</sup> The amount of suspension of disbelief required to endorse a particular CT varies across the population of CTs (keeping in mind that some CTs have been shown to be true).

<sup>&</sup>lt;sup>5</sup> The level of cognitive effort one might put into "mustering up" evidence could vary from a low-effort "is this believeable?" heuristic" to a more effortful, cognitive weighing of arguments for and against.

<sup>&</sup>lt;sup>6</sup> This hypothesis (and H2) conceptualizes trust differently than does the framing literature. In that literature, trust is often measured by source credibility (e.g., Druckman 2001). Here, given that my experiment does not mention the source of the CT, I take my cue from Miller et al. 2016, who argue (and find) that belief in CTs *in general* is likely to be moderated by generalized trust in people, institutions, and the media.

With regard to AGW hoax beliefs, the effect of trust may be more nuanced than previous research suggests.<sup>7</sup> As reviewed above, the desire to engage in motivated conspiracy endorsement when the issue is framed as being about GW is likely to be stronger for Republicans (compared to the CC frame) because the policy and identity implications are much more unpleasant. Therefore, I hypothesize that the two-way interaction between generalized trust and party identification (H1) will be qualified by a three-way interaction between trust, party identification, and hoax frame. Specifically, generalized trust will moderate motivated conspiracy endorsement among Republicans when it comes to CC, but will not have a similar moderating effect when it comes to GW. In the balancing act between identity/attitude protection (motivated reasoning) and maintaining an illusion of objectivity (thus rejecting that trustworthy actors would engage in conspiracies), maintaining an illusion of objectivity will "win out" with regard to CC (when Republicans' identities are less threatened), whereas identity/attitude protection will "win out" with regard to GW (when Republicans' identities are more threatened).

H2: For Republicans, trust will have a larger negative effect on the belief that CC is a hoax than the belief that GW is a hoax. For Democrats, trust will have either no effect (because of the potential floor in endorsement) or a negative effect on both the CC and GW question frames.

#### **Description of Study and Measures**

To test these hypotheses, I analyzed an original online survey experiment of 2,316 Republicans and Democrats administered between November 21 to December 13, 2013 via Amazon.com's Mechanical Turk (MTurk). The use of MTurk in social science research is growing in popularity, as it provides access to more demographically diverse samples of the US

<sup>&</sup>lt;sup>7</sup> Miller et al. (2016) did not account for the possible variation in identity threat across the CTs they used in their indices/analyses. If they had, I suspect that trust would have mitigated belief in low identity threat CTs to a greater extent than high identity threat CTs.

voting-age population than other commonly-used convenience samples, and provides highquality data (e.g., Clifford et al. 2015; Huff and Tingley 2015; Mullinix et al. 2015).

*Experimental manipulation and dependent variable*. Respondents were randomly assigned to receive one of two CT question frames: "Some people believe that [global warming/climate change] is a hoax. Others do not believe this. What do you think?" Responses were coded such that 1="definitely not a hoax," 2="probably not a hoax," 3="probably is a hoax," and 4="definitely a hoax," which was then recoded to 0-1.<sup>8</sup> 1,174 (807 Democrats, 367 Republicans) respondents were assigned to the GW condition and 1,142 (809 Democrats, 333 Republicans) were assigned to the CC condition.

*Explanatory variables*. The primary explanatory variables of interest are party identification and generalized trust. For party identification, the standard seven-point partisanship measure was recoded into a Republican dummy variable with "leaners" coded as partisans (1=Republican, 0=Democrat; pure Independents were dropped from the analyses).

The trust index is an average of responses to four questions (coded on four-point scale ranging from 0-1 such that higher numbers equal greater trust) that assessed how much of the time respondents thought that 1) the federal government, 2) law enforcement, 3) the media, and 4) people in general can be trusted to do what is right (alpha=.58).<sup>9</sup>

<sup>&</sup>lt;sup>8</sup> This question is in line with the way CTs have been measured in the literature. Oliver and Wood (2014) ask respondents to indicate how much they agree or disagree with each CT. The 2012 American National Election Study asks, for example, "Some people say that when Hurricane Katrina hit the Gulf Coast in the summer of 2005, the federal government intentionally breached flood levees in New Orleans so that poor neighborhoods would be flooded and middle class neighborhoods would be spared. Do you think the federal government definitely did this, probably did this, probably did not do this, or definitely did not do this?" To avoid acquiescence bias (Krosnick 1991), and to avoid bias due to unbalanced questions (Schuman & Presser 1991), I adapted the ANES measure to include both sides of the spectrum. <sup>9</sup> It is unfortunate that this survey did not include a measure of trust in scientists. But given the documented differences between Democrats and Republicans in trust in scientists (e.g., Bolsen et al. 2015), I suspect that there would be too little variance among the partisan groups to provide a clear test of

a moderation hypothesis.

To isolate the effects of trust, analyses below control for the following (all coded to range from 0-1): political knowledge, authoritarianism, efficacy, need for cognition, need for evaluation, assessment of federal power, religiosity, education, income, gender, age, ethnicity/race, and the Big Five.<sup>10</sup>

#### Results<sup>11</sup>

Using OLS, I estimated the two-way interaction between party identification and trust to test H1 (that the party identification effect on AGW hoax belief will be moderated by generalized trust, regardless of question framing). The interaction is positive and statistically significant (b=-.35, se=.10; see Model 1 in Table 1). Figure 1 displays the shape of the interaction. Consistent with H1, generalized trust is *negatively* associated with hoax beliefs among Republicans (b=-.39, se=.09) and is not associated with hoax beliefs among Democrats (b=-.04, se=.04, owing to a floor effect on hoax beliefs). Generalized trust *moderates* AGW hoax beliefs among Republicans.

Model 2 of Table 1 reports the test of H2 (*that for Republicans, trust will have a larger negative effect on the belief that CC is a hoax than the belief that GW is a hoax. For Democrats, trust will have either a flat or negative effect on both the CC and GW question frames).* The interaction between party identification, trust, and question frame is positive and statistically significant (b=.47, se=.20). The shape of the interaction confirms H2 (see Figure 2).<sup>12</sup> Among Democrats, the trust slopes for GW and CC hoax frame are both negative and not statistically significantly different from one another (b=-.03, se=.06 for the trust x question frame interaction

<sup>&</sup>lt;sup>10</sup> See Appendix E for question wordings for all variables.

<sup>&</sup>lt;sup>11</sup> Descriptive statistics of the belief that CC and GW are hoaxes, as well as of the partisan differences on those beliefs, appear in Appendix A.

<sup>&</sup>lt;sup>12</sup> I report the OLS results rather than ordered logit here as the OLS estimates are more intuitive and require less space to elaborate. The ordered logit results (which are consistent with the OLS results) appear in Appendix C, along with additional robustness checks.

among Democrats). Among Republicans, the effect of trust on belief that CC is a hoax is negative and quite large (b=-.61, se=.12);<sup>13</sup> the predicted value on the CC hoax question drops from .61 to near 0 when moving across the full range of the trust scale. In contrast, the trust effect on GW hoax beliefs among Republicans is negative, but not statistically significant (b=-.13, se=.14). The two trust slopes are statistically significantly different from one another (b=.49, se=.18 for the trust x question frame interaction among Republicans). In the case of CC, which sounds less threatening and less severe than global warming, trust mitigates hoax beliefs. In contrast, in the case of GW, where the implications of belief have much more unpleasant policy consequences, motivated reasoning "wins out," and trust does not mitigate conspiracy endorsement among Republicans.<sup>14</sup>

To clarify these differences further, Figure 3 provides the differential (GW minus CC) between the effect of trust between the two frames across partisans. Figure 3 demonstrates a completely flat, insignificant finding for Democrats across the experimental conditions, while showing a decrease of -.15 (se=.08) in endorsement among low trust Republicans when the GW frame is used instead of the CC frame. Among high trust Republicans, an increase of .33 (se=.11) in endorsement results when the GW frame is used instead of the CC frame.

<sup>&</sup>lt;sup>13</sup> Simple slopes are presented here in Figure 2 to decompose the three-way interaction between question frame, partisanship, and trust; marginal effects plots appear in Appendix F.

<sup>&</sup>lt;sup>14</sup> I reran the moderating interactions from both Model 1 and Model 2 in Table 1 through a diagnostic tool called *interflex* on Stata (Hainmuller et al 2016, Brambor, Clark, and Golder 2006) manual and installation guide can be found here: <u>http://yiqingxu.org/software/interaction/StataGuide.pdf</u>). The *interflex* software facilitates the estimation of the conditional marginal effect of a treatment on an outcome variable across terciles of a moderator as well as the presentation of conventional linear marginal effects. All of the interactions in this manuscript returned p-values for their respective Wald tests greater than .3, meaning that linear extrapolation is appropriate across the moderator for all of the models reported here (see Appendix D for more details).

		Ma dal (0)		
VARIABLES	Model (1)	Model (2)		
PID Dummv (Republican=1)	0.39***	0.46***		
	(0.04)	(0.06)		
Ques Frame Dummy (GW=1)	0.01	-0.00		
	(0.01)	(0.03)		
Republican X QF Dummy		-0.14+		
		(0.09)		
Trust	-0.04	-0.04		
	(0.04)	(0.05)		
Republican X Trust	-0.35***	-0.56***		
	(0.10)	(0.12)		
QF Dummy X Trust		0.00		
		(0.07)		
Republican X QF Dummy X Trus	t	0.47**		
		(0.20)		
Constant	0.01	0.02		
	(0.05)	(0.05)		
Observations	2,112	2,112		
R-squared	0.30	0.30		
Robust standard errors in parentheses				
*** p<0.01, ** p<0.05, + p<0.1				

Table 1. OLS Estimates of Global Warming/Climate Change as a Hoax

Note: Both Models 1&2 were specified with controls for political knowledge, authoritarianism, efficacy, need for cognition, need for evaluation, assessment of federal power, religiosity, education, income, gender, age, ethnicity/race, and the Big Five. Those coefficients are reported in full in Models 5 and 6 of Table C-1 in Appendix C.



Figure 1. Two-way Interaction between Party Identification and Trust

Values beside each simple slope represent respective unstandardized regression coefficients and standard errors



Figure 2. Three-way Interaction between Party Identification, Question Frame, and Trust

Values beside each simple slope represent respective unstandardized regression coefficients and standard errors



Figure 3: The Difference in the Marginal Effects of the GW/CC Treatment across Partisans

#### **Discussion**

In sum, I argue that the strategic framing choices made by Republican elites rely on the motivated reasoning of their partisans to reinforce and perpetuate the belief that AGW is a hoax. Under the conditions that activate motivated reasoning, it is likely that it has become more and more difficult for Republican voters to support policies that (and candidates who) would take steps to address the AGW issue. Moreover, I find that trust moderates AGW hoax beliefs among Republicans, but only under the less identity threatening CC frame.

With regard to CT beliefs in general, these findings raise an interesting proposition: perhaps identity threat is a key to understanding the conditions under which motivated CT belief are going to be the strongest, and when factors like trust may mitigate such beliefs. Research on the antecedents of CT beliefs has yet to systematically address the impact of the ways in which CTs vary (e.g., the number of people involved, the time horizon for the conspiracy, whether the theorized conspiracy is in regards to a discrete event or is more wide-ranging) on the strength and persistence of endorsement (but see Grimes 2016 and Keeley 1999). The research reported here suggests that the degree to which a CT implicates people's attitudes and/or identities may affect the motivation to believe the CT in general, and the ways in which variables such as trust moderate such beliefs. With regard to AGW CT beliefs in particular, as discussed more extensively above, these findings reinforce the existing evidence that partisans' beliefs are strongly affected by elite cues on this issue--the frames that Republican elites use to talk about GW/CC matter.

The findings about trust relayed here also offer a potential path to reconciling conflicting findings (e.g., Dunlap 2014; Schuldt et al. 2011, Schuldt et al. 2015) about whether or not the CC versus GW frame conditions the effect of partisanship (Democrat vs. Republican) on belief in the existence of AGW. Whereas Schuldt and colleagues (2011; 2015) find that the partisan gap in existence beliefs is larger for the GW than the CC frame, Dunlap (2014) finds no impact of the GW/CC frames. None of those studies took trust into account as a potential moderator of beliefs; perhaps if they had, results may have been more consistent across the studies. Future research should explore whether the trust effects evidenced here, with regard to belief in conspiracy theories, generalize to questions about the existence of AGW that do not explicitly raise the spectre of conspiracy.

In conclusion, for those looking for ways to persuade those who believe in the extremely cynical scenario that AGW is a hoax to think otherwise, the lesson is that attempts to increase

trust combined with strategic use of the climate change frame, is likely to be most fruitful. However, given the notable declines in trust in our institutions and others (Hetherington and Rudolph 2015), the prospects of increasing trust appear quite dim. Conversely, for those looking for ways to reinforce beliefs that AGW is a conspiratorial hoax and/or persuade others to their cause, the prescription is simpler, if not more harrowing. Hetherington and Rudolph (2015) show that political distrust in the electorate and between partisan elites has constrained the policy options available to legislators in our polarized political environment. As such, there is no need to attack AGW head on to accomplish the goals of subverting pro-AGW policy attitudes in the electorate; undermining trust and facilitating partisan motivated reasoning (through the strategic use of the GW frame) should be sufficient. Further, the tendency for people to seek out information that confirms their predispositions means that they rarely venture outside of their ideological echo chambers (Feldman et al. 2014). Thus, CTs (such as that AGW is a hoax) have a self-reinforcing quality. As such, much of the research on the antecedents and consequences of CT endorsement leads to the unfortunate conclusion that these beliefs are close to intractable and may only be responsive to Republican elite persuasion, and barring that, life experience and the observation of ecological tragedy.

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Appendices to Accompany "The Impact of Elite Frames and Motivated Reasoning on Beliefs in a Global Warming Conspiracy: The Promise and Limits of Trust"

## Appendix A: Descriptive Statistics for the Dependent Variable

Figure A1 reports descriptive statistics on the distribution of responses to the AGW hoax question (collapsing across question framing), separately for Democrats and Republicans. Not surprisingly, there are large partial differences in the belief that AGW is a hoax. Republicans are much more likely to endorse the hoax conspiracy than Democrats.



Figure A1. Distribution of Endorsement that GW/CC is a Hoax

Figures A2 and A3 report descriptive statistics on the distribution of responses to the global warming vs. climate change questions, and on those distributions for Democrats and Republicans. As Figure A2 shows, the distribution of responses is virtually identical for the two question frames. Collapsing across party identification, there is no difference in the distribution of beliefs, on the one hand, that global warming is a hoax, and on the other hand, that climate change is a hoax. But the distributions change dramatically when separated by party affiliation. Figure A3 illustrates the (unsurprising) partisan differences between Republicans and Democrats—with Republicans showing themselves to be much more likely to endorse the idea that *either* AGW frame is a hoax. Figure A3 also shows that, while there is no difference in beliefs that global warming vs. climate change is a hoax for Democrats (see Panel 1 of Figure A3), in contrast, Republicans are slightly more likely to believe that global warming is a hoax than they are to believe that climate change is a hoax, and are also more likely to agree that climate change is definitely not a hoax compared to global warming (see Panel 2 of Figure A3).



Figure A2. Distribution of Hoax Endorsement Responses across GW/CC Frames

Note: Columns are labeled with percentages, rounding errors may add up to more than 100%

Figure A3. Partisan Differences in Responses across GW/CC Frames



Note: Columns are labeled with percentages, rounding errors may add up to more than 100%

Variable	Ν	Mean	Std. Dev.	Min	Max
Endorsement of GW/CC as Hoax	2313	0.187635	0.289265	0	1
Party Identification Dummy (R=1)	2316	0.302245	0.45933	0	1
Question Wording Dummy (GW=1)	2316	0.506909	0.50006	0	1
Generalized Trust	2316	0.398724	0.149084	0	1
Political Knowledge	2316	0.663243	0.20544	0.071429	1
Authoritarianism	2316	0.380541	0.208679	0	1
Efficacy	2316	0.337651	0.195129	0	1
Need for Cognition	2309	0.659647	0.333822	0	1
Need for Closure	2312	0.608816	0.242209	0	1
Federal Power	2312	0.760597	0.293253	0	1
Religiosity	2307	0.364001	0.370777	0	1
Education	2292	0.506399	0.285966	0	1
Income	2306	0.526236	0.296518	0	1
Gender	2301	0.596697	0.490667	0	1
Age	2309	0.261475	0.197302	0	1
Latino	2281	0.09075	0.287316	0	1
White	2303	0.826314	0.378922	0	1
Openness	2301	0.695603	0.205507	0	1
Conscientiousness	2285	0.702735	0.213807	0	1
Extraversion	2296	0.437573	0.269616	0	1
Agreeableness	2275	0.681062	0.207633	0	1
Emotional Stability	2286	0.612897	0.245388	0	1

# Appendix B. Summary Statistics for Variables in MTurk Survey

Note: Summary statistics with pure independents removed

# Appendix C. Different Model Specifications/Robustness Checks (Three-Way Interaction without Controls; Main Effects Models; Models with Controls; Ordered Logit Results)

For robustness checks and as a response to very constructive reviews, here I report some additional model specifications, which I should say in summary, strengthen my confidence in the findings reported in the body of the paper.

Model 1 of Table C-1 estimates the OLS model with just the Republican dummy, the question frame dummy, trust, and a two-way interaction between Republican and question frame with no other controls, the result of the interaction term is statistically significant (b=.05, se=.02).

Model 2 of Table C-1 estimates the full three-way interaction OLS model (compare to Model 2 in the body of the paper, which is provided as Model 6 in Table C-1 for ease of comparison), but also with no controls. This model's coefficients are very similar to its analog with controls in the paper.

Model 3 of Table C-1 estimates the main effects OLS regression model predicting hoax beliefs with the Republican dummy variable, the question frame dummy, trust, and controls. Republicans are more likely to believe that AGW is a hoax (regardless of the way the question is framed) than Democrats (b=.26, se=.02).

Model 4 in Table C-1 adds an interaction between question framing and party identification, though the finding is not significant for that term in this specification, it is significant without controls (see Model 1 of Table C-1), which motivated this further investigation that led to the results shown in the body of the paper.

Models 5 and 6 here in Table C-1 correspond to Models 1 and 2 of Table 1 as discussed in the prose of the article—all control variables are reported.

Table C-2 below illustrates ordered logit results paralleling the main OLS specifications, with Model 1 in Table C-2 replicating Model 1 in Table C-1, followed by Model 2 in Table C-2 replicating the full model specification (analogous to Model 5 in Table C-1 discussed above and Model 2 of Table 1 in the body of the paper). The ordered logit results are quite similar to the OLS results, and so for the ease of presentation, I made the choice to report the OLS results in the manuscript.

VARIABLES	Model(1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
PID Dummy (Republican=1)	0 28***	0 49***	0 26***	0 24***	0.39***	0 46***
(Republican 1)	(0.02)	(0,00)	(0.02)	(0.02)	(0.04)	(0.06)
Ques Frame Dummy (GW=1)	-0.00	-0.00	0.01	-0.00	0.01	-0.00
	(0.01)	(0.04)	(0.01)	(0.01)	(0.01)	(0.03)
Republican X QF Dummy	0.05**	-0 14**	(0.0.1)	0.04	(0.0.)	-0 14+
	(0.02)	(0.07)		(0.03)		(0.09)
Trust	-0.13***	-0.04	-0.14***	-0.14***	-0.04	-0.04
	(.03)	(0.05)	(0.04)	(0.04)	(0.04)	(0.05)
Republican X Trust	( )	-0.53***	( )	( )	-0.35***	-0.56***
,		(0.11)			(0.10)	(0.12)
QF Dummy X Trust		-0.01			( )	0.00
		(0.08)				(0.07)
Republican X QF Dummy X Trust		0.48***				0.47**
		(0.16)				(0.20)
Knowledge		· · ·	-0.04	-0.03	-0.04	-0.04
-			(0.03)	(0.03)	(0.03)	(0.03)
Authoritarianism			0.05	0.05	0.05	0.05+
			(0.03)	(0.03)	(0.03)	(0.03)
Efficacy			0.03	0.03	0.03	0.03
			(0.03)	(0.03)	(0.03)	(0.03)
Need for Cognitiion			-0.02	-0.03	-0.02	-0.02
			(0.02)	(0.02)	(0.02)	(0.02)
Need for Evaluation			-0.00	-0.00	-0.00	-0.00
			(0.03)	(0.03)	(0.03)	(0.03)
Federal Power			0.10***	0.10***	0.11***	0.10***
			(0.02)	(0.02)	(0.02)	(0.02)
Religiosity			0.09***	0.08***	0.08***	0.08***
			(0.02)	(0.02)	(0.02)	(0.02)
Education			-0.03	-0.03+	-0.03	-0.03+
			(0.02)	(0.02)	(0.02)	(0.02)
Income			0.03+	0.03+	0.03	0.03
			(0.02)	(0.02)	(0.02)	(0.02)
Gender			-0.02+	-0.02+	-0.02+	-0.02+
			(0.01)	(0.01)	(0.01)	(0.01)
Age			0.08***	0.08**	0.08***	0.08***
			(0.03)	(0.03)	(0.03)	(0.03)
Latino			0.00	0.00	0.00	0.00
			(0.02)	(0.02)	(0.02)	(0.02)
White			0.03**	0.03**	0.03**	0.03**
_			(0.01)	(0.01)	(0.01)	(0.01)
Opennness			-0.02	-0.02	-0.02	-0.02
			(0.03)	(0.03)	(0.03)	(0.03)
Conscientiousness			-0.01	-0.02	-0.02	-0.02
<b>F</b> (			(0.03)	(0.03)	(0.03)	(0.03)
Extraversion			0.02	0.02	0.02	0.02
A			(0.02)	(0.02)	(0.02)	(0.02)
Agreeableness			-0.01	-0.01	-0.01	-0.01
Emotional Stability			(0.03)	(0.03)	(0.03)	(0.03)
Emotional Stability			0.02	0.02	0.02	0.01
Constant	0 15***	0 11***	(0.03)	(0.03)	(0.03)	(0.03)
Constant	0.15	(0.00)	0.04	0.04	0.01	0.02
	(0.02)	(0.02)	(0.05)	(0.05)	(0.05)	(0.05)
Observations	2212	2212	2 112	2 112	2 1 1 2	2 112
R-squared	0.25	0.26	<u>ح, ۱۱۲</u> ۲ 20	<u>ح, ا اح</u> ۱ 2۵	0.30	0.30
Robust standard errors in parentheses	0.20	0.20	0.29	0.29	0.00	0.30
*** p<0.01, ** p<0.05, + p<0.1						

 Table C-1: OLS Estimates of Global Warming/Climate Change as a Hoax

VARIABLES	Model (1)	Model (2)
PID Dummy (Republican=1)	3.14***	2.90***
Ques Frame Dummy (GW=1)	-0.07	-0.13
	(0.34)	(0.36)
Republican A QF Duniny	-0.82 (0.53)	(0.57)
Trust	-0.42	-0.41
Republican X Trust	(0.54) -2.86***	(0.60) -3.09***
QF Dummy X Trust	(0.87) -0.05	(0.94) 0.27
Republican X QF Dummy X Trust	(0.79) 2.95**	(0.85) 2.54+
Knowledge	(1.27)	(1.36) -0.73***
Authoritarianism		(0.28) 0.57**
		(0.23)
Efficacy		0.34
Need for Coanitiion		-0.28+
- 3		(0.16)
Need for Evaluation		-0.26
Es devel Deven		(0.22)
Federal Power		1.23***
Religiosity		0.73***
5 ,		(0.14)
Education		-0.37**
Income		(0.19)
licome		(0.28
Gender		-0.16
		(0.11)
Age		0.63**
Latino		(0.27)
Latino		(0.18)
White		0.33**
		(0.14)
Opennness		-0.23
Conscientiouspass		(0.27)
Conscientiousness		-0.21
Extraversion		0.26
		(0.19)
Agreeableness		-0.22
Emotional Stability		(0.28)
Emotional Otability		(0.24)
/Cut1	1.04***	1.78***
	(0.23)	(0.45)
/Cut2	2.64***	3.45***
/Cut3	(0.24) 3 78***	(0.40 <i>)</i> 4 60***
, 5415	(0.25)	(0.46)
Observations	2313	2112
Pseudo R-squared	0.13	0.16

# Table C-2: Ordered Logit Estimates of Global Warming/Climate Change as a Hoax

Robust standard errors in parentheses \*\*\* p<0.01, \*\* p<0.05, + p<0.1

### Appendix D. Interflex Extrapolation and Marginal Effects Results

On the suggestion of a reviewer, I reran the moderating interactions from both Model 1 and Model 2 in Table 1 through a diagnostic tool called *interflex* on Stata (Hainmuller et al (2016); manual and installation guide can be found here:

http://yiqingxu.org/software/interaction/StataGuide.pdf). Their work is an extension of Brambor, Clark, and Golder 2006; the *interflex* software facilitates the estimation of the conditional marginal effect of a treatment on an outcome variable across different values of a moderator as well as the presentation of conventional linear marginal effects; *interflex* accomplishes this by binning the estimates, in this case by terciles, to explore whether linear extrapolation is valid. The plots presented here mirror what is presented in Figures 1 and 2 in the body of the paper. *Interflex* also presents a Wald test on those terciles (which tests whether we can reject the null hypothesis that the linear interaction model and tercile model are statistically equivalent). The two-way Republican x trust interaction (Figure 1; Model 1 in Table 1) as well as the decomposed three-way Republican x trust x question frame interaction (Figure 2; Model 2 in Table 1) all returned p-values for their Wald tests greater than .3, meaning that linear extrapolation is appropriate across the moderator for all of these models.

# Figure D-1. Two-Way Interaction Between Party ID Dummy and Trust for GW&CC as Hoax Combined



Note: This replicates the marginal effects of Model 1 of Table 1 and Figure 1 from the body of the paper. P-value of Wald test=.45; linear extrapolation across the moderator is appropriate.

Figure D-2. Two-Way Interaction Between Party ID Dummy and Trust for CC as Hoax



Note: This replicates the marginal effects of Model 2 of Table 1 and the first panel of Figure 2 from the body of the paper; P-value of Wald test=.39; linear extrapolation across the moderator is appropriate.





Note: This replicates the marginal effects of Model 2 of Table 1 and the second panel of Figure 2 from the body of the paper; P-value of Wald test=.34; linear extrapolation across the moderator is appropriate.

## **Appendix E. Question Wordings**

### **Conspiracy Theory Frame Experiment/Question**

Some people believe that global warming [climate change, randomly assigned] is a hoax. Others do not believe this. What do you think? *Global warming [climate change] is definitely a hoax, global warming [climate change] is probably a hoax, global warming [climate change] is probably not a hoax, or global warming [climate change] is definitely not a hoax.* 

\*Note: The above question included a wording experiment; the results reported here are the same for both versions.

#### Partisan Identification

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

Democrat Republican Independent Other Party, please specify: \_\_\_\_\_

[If "Democrat"]:

Would you call yourself a strong Democrat or a not very strong Democrat?

Strong Democrat Not very strong Democrat

[If "Republican"]:

Would you call yourself a strong Republican or a not very strong Republican?

Strong Republican Not very strong Republican

[If "Independent" or "Other Party"]:

Do you think of yourself as closer to the Democratic Party or the Republican Party?

Closer to the Democratic Party Closer to the Republican Party Closer to Neither Party

## **General Trust**

How much of the time do you think you can trust each of the following groups to do what is right? *Almost always, Most of the time, Some of the time, Almost never*:

The federal government in Washington, D.C. Law enforcement The media People in general

### Political Knowledge

Which party currently has the most members in the U.S. House of Representatives in Washington, D.C.? *Republican Party or Democratic Party* 

Would you say that one of the parties is more conservative than the other at the national level? *Republican Party, Democratic Party, or Neither party is more conservative than the other* 

What job or political office is now held by John Roberts? *Chair of the Democratic National Committee, Senate Majority Leader, Chief Justice of the Supreme Court, or Chair of the Republican National Committee* 

Who is the current President of Russia? Dmitry Medvedev, Vladimir Putin, Boris Yeltsin, or Viktor Zubkov

Who is the current Speaker of the U.S. House of Representatives? *Nancy Pelosi, Harry Reid, Marco Rubio, or John Boehner* 

What job or political office is now held by Joe Biden? *House Minority Leader, Vice President of the United States, Secretary of Defense, or Secretary of State* 

What job or political office is now held by David Cameron? Prime Minister of the United Kingdom, CEO of Target Corp., Prime Minister of Australia, or Secretary of the Treasury

Whose responsibility is it to nominate judges to the U.S. Federal Courts? *The President, The U.S. Senate, The U.S. House of Representatives, or The Supreme Court* 

How long is the term of office for a U.S. Senator? 2 years, 4 years, 6 years, or 8 years

Whose responsibility is it to determine if a law is constitutional or not? *The President, The U.S. Senate, The U.S. House of Representatives, or The Supreme Court* 

How much of a majority is required for the U.S. Senate and House of Representatives to override a presidential veto? *1/2*, *3/5*, *2/3*, *or 3/4* 

Who is the current U.S. Secretary of State? *Hillary Clinton, Janet Napolitano, John Kerry, or Tom Ridge* 

Who is the current U.S. Secretary of Treasury? *Ben Bernanke, Timothy Geithner, Larry Summers, or Jacob Lew* 

Who is the current Prime Minister of Canada? John Major, Stephen Harper, François Mitterrand, or Paul Martin

## <u>Authoritarianism</u>

Although there are a number of qualities that people feel that children should have, every person thinks that some are more important than others. Below are pairs of desirable qualities. For each pair, *please indicate which one you think is more important for a child to have*:

independence or respect for elders [anes: auth\_ind] curiosity or good manners [anes: auth\_cur] obedience or self-reliance [anes: auth\_obed] being considerate or well behaved [anes: auth\_consid]

## External Efficacy

How much do public officials care what people like you think? A great deal, A lot, A moderate amount, A little, Not at all

How much can people like you affect what the government does? A great deal, A lot, A moderate amount, A little, Not at all

## Need for Cognition

Some people like to have responsibility for handling situations that require a lot of thinking, and other people don't like to have responsibility for situations like that. What about you? *Do you like having responsibility for handling situations that require a lot of thinking, do you dislike it, or do you neither like nor dislike it? Do you like it a lot or just somewhat? Do you dislike it a lot or just somewhat?* 

Some people prefer to solve simple problems instead of complex ones, whereas other people prefer to solve more complex problems. Which type of problem do you prefer to solve: *simple or complex*?

## Need to Evaluate

Some people have opinions about almost everything; other people have opinions about just some things; and still other people have very few opinions. What about you? *Would you say you have opinions about almost everything, about many things, about some things, or about very few things*?

Compared to the average person do you have fewer opinions about whether things are good or bad, about the same number of opinions, or more opinions? Would you say that you have

a lot fewer opinions or just somewhat fewer opinions? Would you say that you have a lot more opinions or just somewhat more opinions?

## Attitudes about the Federal Government

Do you think the federal government today has *too much power*, *about the right amount of power*, *or has too little power*?

## <u>Religiosity</u>

How would you classify your level of involvement with your religion or spirituality? Very active, Moderately active, Neither active nor inactive, Moderately inactive, Very inactive.

<u>Sex</u> Are you *male or female*?

## Age

What age did you turn on your most recent birthday?

## **Education**

What is the highest level of school you have completed or the highest degree you have received? Less than 1st grade, 1st, 2nd, 3rd, or 4th grade, 5th or 6th grade, 7th or 8th grade, 9th grade, 10th grade, 11th grade, 12th grade no diploma, High school graduate - high school diploma or equivalent (for example: GED), Some college but no degree, Associate degree (For example: Occupational/vocational program or Academic program), Bachelor's Degree (For example: BA, AB, BS), Master's Degree (For example: MA, MS, MEng, MEd, MSW, MBA), Professional School Degree (For example: MD, DDS, DVM, LLB, JD), Doctorate degree (For example: PhD, EdD), Other, please specify

## <u>Income</u>

QINCOME1. The next question is about the total income of YOUR HOUSEHOLD for the PAST 12 MONTHS. Please include your income PLUS the income of all members living in your household (including cohabiting partners and armed forces members living at home). Please count income BEFORE TAXES, including income from all sources (such as wages, salaries, tips, net income from a business, interest, dividends, child support, alimony, and Social Security, public assistance, pensions, or retirement benefits).

What was your total HOUSEHOLD income in the past 12 months? *Under* \$5,000, \$5,000-9,999, \$10,000-12,499, \$12,500-14,999, \$15,000-17,499, \$17,500-19,999, \$20,000-22,499, \$22,500-24,999, \$25,000-27,499, \$27,500-29,999, \$30,000-34,999, \$35,000-39,999, \$40,000-44,999, \$45,000-49,999, \$50,000-54,999, \$55,000-59,999, \$60,000-64,999, \$65,000-69,999, \$70,000-74,999, \$75,000-79,999, \$80,000-89,999, \$90,000-99,999, \$100,000-109,999, \$110,000-124,999, \$125,000-149,999, \$150,000-174,999, \$175,000-249,999, \$250,000 or more

## <u>Latino</u>

Are you Spanish, Hispanic, or Latino?

## <u>Race</u>

Below is a list of five race categories. Please choose one or more races that you consider yourself to be. Check all that apply: *White, Black or African-American, American Indian or Alaska Native, Asian, Native Hawaiian or other Pacific Islander, Other, please specify* 

## TIPI (Big Five Personality Traits)

Here are a number of personality traits that may or may not apply to you. Please indicate the extent to which you agree or disagree with each statement. You should rate the extent to which the pair of traits applies to you, even if one characteristic applies more strongly than the other. Agree strongly, *Agree moderately, Agree a little, Neither agree nor disagree, Disagree a little, Disagree moderately, Disagree strongly.* 

I see myself as...

extraverted, enthusiastic critical, quarrelsome dependable, self-disciplined anxious, easily upset open to new experiences, complex reserved, quiet sympathetic, warm disorganized, careless calm, emotionally stable conventional, uncreative



# Appendix F. Marginal Effects Plot for the Effects of Trust on GW/CC Hoax Beliefs