# The Persuasive Power of Partisan Elites: How to Induce Renewable Energy Behaviors Without Dispelling Climate Skepticism

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**Abstract**

How can elected officials shift Americans' attitudes toward renewable energy and climate change? When officials are unable to increase belief in climate change, can they still induce mitigation behaviors such as installing solar panels or driving electric vehicles (EVs)? Using two pre-registered survey experiments (n = 9,298 and n = 9,903), I test various pro-solar and pro-EV messages from co-partisan elites. I compare how climate cues and costly action cues affect attitudes toward solar panels and community solar (Study 1), electric vehicles and low-carbon transportation (Study 2), and anthropogenic climate change (Study 1 and 2). Consistent with prior research on the influence of elite cues, every treatment significantly increased respondents' likelihood of installing solar panels or driving electric vehicles. Climate cues were never less effective than other cues for Republicans — despite previous research on motivated reasoning and partisan polarization on the environment. Thus, attributing the climate message to Republican elites counteracted the well-studied "boomerang" or "backfire" effect of climate cues. On the other hand, none of the treatments increased belief in climate change for Republicans or Democrats. Optimistically, this combination of results suggests that co-partisan elites can motivate climate-friendly behaviors even without dispelling climate skepticism. Attitudes toward renewable energy may not yet be irreversibly entangled with the issue of climate change. Additionally, I use costly action cues to test if partisan elites become more persuasive when they themselves engage in the behavior they are promoting; contrary to my preregistered hypothesis, I find little evidence of this. I thus contribute to the literature on political communication by applying the theory of credibility-enhancing displays (CREDs) to politics.

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# 1 Introduction

Urgent action to reduce greenhouse gas emissions is crucial. The world likely has only 9 years left to limit global warming to 1.5 degrees Celsius, assuming 2022 emissions levels (Friedlingstein et al. 2022). Passing this temperature threshold could trigger multiple "tipping points" that render climate change irreversible through a cascade of impacts ranging from collapsing ice sheets to thawing permafrost (Armstrong McKay et al. 2022).

Unfortunately, urgent action in the United States seems unlikely given current political attitudes toward climate change and renewable energy. Though most Americans do now believe in the existence of climate change, an increase in partisan polarization regarding climate change continues to inhibit climate policy (Ballew et al. 2019). Conspiracy theories about the causes and consequences of climate change remain widespread, with substantial effects on belief in climate change as well as behavior and policy support (Biddlestone, Azevedo and van der Linden 2022).

As Goldberg, Gustafson and Van Der Linden (2020) note, "social solutions" are required to confront the climate crisis. Absent changes in attitudes, norms, and behaviors, technological innovations may not be adopted, and environmental policies may not be implemented. In particular, scholars have strongly emphasized the importance of shifting "second-order climate beliefs" — beliefs about what other people believe. Research consistently shows that people are more likely to believe in climate change and support efforts to mitigate it when they think others in their in-group(s) hold these same attitudes (Mildenberger and Tingley 2019; Goldberg et al. 2020; Geiger and Swim 2016). In fact, second-order climate beliefs may be even better predictors of actual behavior than first-order climate beliefs (Jachimowicz et al. 2018).

For many Americans, their political party may be their strongest in-group. Partisanship functions as an expressive social identity that filters much of opinion formation through motivated reasoning (Bolsen, Druckman and Cook 2014; Huddy, Mason and Aarøe 2015; Huddy and Bankert 2017; West and Iyengar 2020). Cues from co-partisan elected officials, or co-partisan "elites," are thus incredibly important in shaping public attitudes (Zaller et al. 1992; Druckman, Peterson and

Slothuus 2013; Bisgaard and Slothuus 2018).[1] Indeed, much climate skepticism among conservatives may be attributed to Republican elite rhetoric (Tesler 2018; Uscinski, Klofstad and Atkinson 2016); conversely, Republican elites are most capable of dispelling belief in climate misinformation among Republicans (Benegal and Scruggs 2018; Hornsey and Lewandowsky 2022; Hurst and Stern 2020; Goldberg et al. 2021).[2] When trusted political parties endorse climate policies, partisans increase their support for those policies (Rinscheid, Pianta and Weber 2021).

Bergquist, Konisky and Kotcher (2020) find that partisanship is the main determinant of energy policy preferences among Americans. Could the influence of partisan elite cues be the cause? Many prominent partisan elites have been engaging in messaging about renewable energy; for instance, President Biden recently tweeted, "Every electric vehicle sold is a win against climate change" (Biden 2022).

In the realm of renewable energy, however, some research suggests that pragmatic concerns may override the influence of partisan cues (Ansolabehere and Konisky 2016). For instance, Mayer (2019) finds that elite partisan cues did little to shift attitudes toward the Clean Power Plan. On the other hand, other studies suggest that elite cues do influence attitudes toward renewable energy policies: co-partisan elite support for a renewable portfolio standard (RPS) makes people much more likely to also support an RPS (Stokes and Warshaw 2017); co-partisan elite endorsement of a carbon tax policy or a nuclear energy policy increases support for those policies (Fielding et al. 2020); and co-partisan elite support for a phase-out of fossil fuel-powered cars increases public support for such a phase-out (Rinscheid, Pianta and Weber 2021).

I contribute to this literature by using two preregistered survey experiments to test the effects of different co-partisan elite cues on attitudes toward solar panels, electric vehicles, and climate change. Study 1 (n = 9,298) tested the effects of pro-solar messages from co-partisan elites on respondents' likelihood of installing solar panels, likelihood of participating in community solar,

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[1]Though see Peterson (2019) on how co-partisan elite cues are constrained if they sufficiently diverge from public preferences.

[2]Though see Chockalingam et al. (2021), which found that corrections endorsed by co-partisan elites were not more effective than standard corrections.

and belief in anthropogenic climate change. Study 2 (n = 9,903) tested the effects of pro-EV messages from co-partisan elites on respondents' likelihood of driving an electric vehicle, support for low-carbon transportation, and belief in anthropogenic climate change.

I choose to explore attitudes toward solar panels and electric vehicles in order to determine how elite cues influence personal behaviors, not just policy preferences. For most people, the personal choice to install solar panels or drive an electric vehicle is a much more salient consideration than their policy preferences regarding RPS, carbon taxes, nuclear energy, or the decades-long phase-out of fossil fuel-powered cars.[3] There are two potential benefits to this approach: first, it is perhaps more likely that respondents' answers will reflect their true beliefs. Asking about issues for which respondents do not have any meaningful priors may produce nonsensical responses not grounded in actual preferences. Second, it is useful to see if partisan elite cues can shift attitudes toward issues for which people have more well-defined priors. People tend to rely more on source cues when evaluating messages about unfamiliar topics (Nicholson 2011). As a result, it is easier to shift attitudes toward something like RPS, which many people are unfamiliar with; it is more difficult to shift attitudes toward something like one's choice of car, which many people have already given much thought to.[4]

Both Study 1 and Study 2 tested the effects of four different treatment messages from elected officials: 1) a baseline message with only the pro-solar or pro-EV message; 2) a climate message that included a climate cue explaining that mitigating climate change was the rationale for the pro-solar or pro-EV message; 3) a "costly action" message that included a costly action cue describing how co-partisan elites were themselves installing solar panels or driving electric vehicles; and 4) a "combination" message that included both the climate cue and the costly action cue. By testing other cues relative to this baseline message, I isolate the effects of the climate cue and the costly

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[3]For a related discussion, see Lacroix et al. (2022) on how personal mitigation behaviors do not spill over to collective mitigation behaviors.

[4]For instance, Bisbee and Lee (2022) find that elite cues on COVID-19 influenced social distancing behaviors in the first few months of 2020, but such elite cues stopped influencing behavior as the issue of COVID-19 lost its novelty and people developed strong priors.

action cue and determine how well they fare compared to the baseline message.

I focus on the climate cue because climate cues are incredibly salient for discussions regarding renewable energy; I focus on the costly action cue because of the literature on credibility-enhancing displays (CREDs). As Kraft-Todd et al. (2018) explain, the logic of CREDs states that "people who themselves engage in a given behaviour will be more effective advocates for that behaviour than people who merely extol its virtues — specifically because engaging in a behaviour credibly signals a belief in its value." In other words, actions are more effective than words at shifting second-order beliefs, because the cost of the action signals credibility. Kraft-Todd et al. (2018) test this theory on solar panel installation and find that community organizers who themselves installed solar panels were able to recruit more residents to also install solar panels, compared to community organizers who did not themselves install solar panels. I apply the theory of CREDs to co-partisan elite cues because I expect that the costly action cue enhances the in-group effect of the co-partisan elite cue by demonstrating it through actions, not merely expressing it through words.

My findings contribute in three ways to the literature on political communication for climate change and renewable energy. First, I provide mixed empirical evidence for the ability of co-partisan elites to shift attitudes toward renewable energy. Despite research suggesting that pragmatic concerns may override the influence of elite cues for renewable energy (Ansolabehere and Konisky 2016; Mayer 2019), other research has found that elite cues do influence attitudes toward renewable energy policies (Stokes and Warshaw 2017; Fielding et al. 2020; Rinscheid, Pianta and Weber 2021). By finding that elite cues also influence personal behaviors relating to renewable energy, I show that elite cues remain persuasive even when the choice is more personal and people have more strongly defined priors.

In Study 1, I find that all four pro-solar messages from co-partisan officials make people more likely to install solar panels and more likely to participate in community solar; these effects are significant for both Republicans and Democrats (with the exception of the baseline message for Republicans' likelihood of participating in community solar). In Study 2, I find that all four pro-EV messages from co-partisan officials make people more likely to drive an electric vehicle; however,

no pro-EV message was effective for Republicans.[5] In my conclusion, I speculate on why pro-solar messages are effective for Republicans but pro-EV messages are not; this result is consistent with recent polls showing that home solar panel adoption is more popular than electric vehicle purchases among Republicans. In terms of support for low-carbon transportation, only the costly action message and combination message had an effect on the pooled sample — thus potentially demonstrating the persuasiveness of CREDs from co-partisan elites.[6]

Second, I find that the climate message is never less effective than the baseline message for Republicans, despite previous research on partisan motivated reasoning and partisan polarization on climate change. This result is striking, as one would expect Republicans to find the climate message less credible or persuasive. Indeed, Diamond and Zhou (2022) conducted a survey experiment testing how different message frames influenced support for clean energy policies, and they found that "among Republicans, the climate frames resulted in no increases in policy support." They conclude that "for Republicans at least, climate change may be a triggering phrase that results in voters dismissing a policy message even if they trust the source of the message." Other researchers have even found "boomerang" effects, where climate change messages actually amplify polarization (Hart and Nisbet 2012). For instance, Ma, Dixon and Hmielowski (2019) found that their climate change message triggered psychological reactance, with negative effects on climate change beliefs, risk perceptions, and support for mitigation policies, while Zhou (2016) found that Republicans "rejected the information to such a degree that they increased their opposition to both proposed governmental and personal climate change action."

However, many of these prior researchers did not test messages from Republican elites. I find that when Republican elites are the ones mentioning climate change, there is no "triggering" or "boomerang" effect on Republicans. In other words, attributing the climate message to a Repub-

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[5]In the results section, I explore how the costly action message is effective for Republicans in exploratory analyses that omit Republicans who recognized a Democratic governor in their treatment article.

[6]Though as I discuss in the results section, effects are null when analyzing Republicans and Democrats separately.

lican elite seems to counteract the well-studied boomerang effect of including a climate cue. This result suggests that Republican elected officials can discuss climate change as a reason to support renewable energy, and the inclusion of the climate cue will not necessarily diminish the credibility or persuasiveness of their message for fellow Republicans.

Third, I show that it is possible to induce emissions-reducing behavior change without shifting attitudes toward climate change, contrary to prior research showing that energy preferences have become "entangled in climate change as a result of elite discourse" (Hawes and Nowlin 2022). Existing research does little to explore the mechanism through which co-partisan elite cues are affecting attitudes toward renewable energy: are these messages from co-partisan elites shifting attitudes toward renewable energy by increasing belief in climate change? Or are they shifting attitudes toward renewable energy merely through the communication of a partisan in-group social norm? Which mechanism or strategy is more effective? Since partisan motivated reasoning fosters climate skepticism among Republicans, Republican beliefs on climate change may be very resistant to change (Druckman and McGrath 2019; Zhou 2016). As a result, researchers should explore how to induce emissions-reducing behavior change without having to convince people that climate change is real or caused by humans. Some scholars suggest that communicative strategies which do not center on climate change — a polarizing topic — may be more effective at promoting climate-friendly behaviors (Mooney 2015).

Consistent with prior research on motivated reasoning, I find that none of the pro-solar or pro-EV messages from co-partisan elites affected Republicans' belief in anthropogenic climate change.[7] Given the necessity of urgent action to reduce greenhouse gas emissions, this finding is certainly unfortunate. However, in conjunction with the above findings, this combination of results may offer some hope: co-partisan elites can induce certain emissions-reducing behavior changes without increasing belief in anthropogenic climate change. In this case, messages from Republican elected

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[7]Though see Goldberg et al. 2021, who found that a one-month advertising campaign "increased Republicans' understanding of the existence, causes and harms of climate change by several percentage points."

officials made Republicans more likely to install solar panels, even though those messages did not affect Republicans' belief in climate change. Thus, attitudes toward renewable energy may not yet be irreversibly entangled with climate beliefs.

I also contribute in two ways to the literature on political communication more generally. First, as discussed in the methods section, I use fictional yet realistic Associated Press articles to convey my treatment messages. Other political communication studies should consider also using realistic news articles to deliver their treatment message(s). Many recent survey experiments still use simple blocks of text to convey their treatment message(s).[8] These blocks of text do not include the trappings of an article one generally sees published online: a headline, picture, website logo, etc. Though there currently exists no empirical literature comparing the effects of treatment messages conveyed by blocks of text and treatment messages conveyed by realistic news articles, using the latter likely improves external validity. In the real world, people do not randomly receive blocks of text in a total vacuum. Their reception of partisan elite cues is mediated by news media. In the context of climate change in particular, Bolsen and Shapiro (2018) find that "the news media are a central source of information about climate change for most people." (See Brutger et al. 2020 for a related discussion about how abstract or detailed experimental stimuli should be.) Additionally, using realistic news articles may increase the credibility of the treatment, because respondents may be more likely to believe that a simple block of text was fabricated for the purpose of the survey. This is especially important when the treatment attributes an ideologically incongruent view to a partisan elite. Previous studies which attribute climate change messages to Republican elites, for instance, may reach inaccurate conclusions about the persuasiveness of climate messaging if they do not use realistic treatments (see, e.g., Zhou 2016).

Second, I apply the theory of CREDs to politics. Simply put, this theory holds that "beliefs

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[8]For example, Merkley and Stecula (2021) showed respondents unadorned blocks of treatment text such as, "Republicans in Congress are increasingly likely to support the science of climate change and some have begun to support government policy aimed at reducing emissions." Benegal and Scruggs (2018) similarly use unadorned text blocks, even though they call their treatments "articles."

are spread more effectively by actions than by words alone" (Kraft-Todd et al. 2018). The theory originated from anthropological studies of cultural evolution and has been widely used to explain religious commitment (Henrich 2009; Lanman and Buhrmester 2017; Langston, Speed and Coleman III 2020). However, no research has explored how the theory of CREDs affects political messaging, even though the effect of CREDs on partisan elite cues would seem to have important implications. For instance, there exist numerous studies on COVID-19 vaccine endorsement by partisan elites (e.g., Pink et al. 2021; Bokemper et al. 2021; Golos et al. 2022); these studies could benefit by testing whether partisan elites themselves getting vaccinated makes their endorsement more persuasive or credible.

Previous research has studied how politicians who speak against their own interest can be more persuasive, presumably because the costliness of such messaging credibly signals a genuine belief in the message. For instance, Baum and Groeling (2009) show that Republican elite criticism of a Republican president is exceptionally damaging for the president, while Clayton and Willer (2021) show that Republican elite defenses of the 2020 election's legitimacy are particularly compelling. Such research is distinct from research on CREDs, which specifically seeks to test if personally engaging in a costly behavior (e.g., getting vaccinated) makes one more credible or persuasive when promoting the adoption of that behavior (e.g., vaccinations) — not just if costly messaging is generally more persuasive or credible.

In the realm of renewable energy, I find limited evidence on the effectiveness of CREDs for co-partisan elites. In Study 1, pro-solar messages that mentioned costly action by co-partisan elites were not more effective than the baseline message in terms of motivating people to install solar panels or participate in community solar. However, the results are mixed for Study 2; messages that included a costly action cue were more effective at motivating Democrats to drive an electric vehicle, though effects are null for Republicans. Also, costly action cues were not more effective at shifting support for low-carbon transportation among Democrats or Republicans, though exploratory analyses show that only the costly action message was able to shift Republican support for low-carbon transportation when omitting Republicans who recognized a Democratic governor

in their treatment article. These results conflict with previous research showing that community organizers who engaged in CREDs were more likely to induce solar panel installation than community organizers who did not (Kraft-Todd et al. 2018). In the conclusion section, I speculate that CREDs may operate differently for partisan elites because partisan elites are not as relatable.

# 2    Hypotheses and Research Questions

My hypotheses and research questions for each study were preregistered on the Open Science Framework prior to data collection for that study. Unless otherwise noted, all analyses follow the preregistered analysis plan for Study 1 (https://osf.io/67wqh) or for Study 2 (https://osf.io/2j4m8).[9]

## Likelihood of installing solar panels (Study 1) or driving an electric vehicle (Study 2)

First, Zaller et al.'s (1992) classic "Receive-Accept-Sample" (RAS) model suggests that members of the public form and adjust their political beliefs based on co-partisan elite cues; as a result, I expect to see that exposure to a pro-solar or pro-EV message from co-partisan officials makes people more likely to install solar panels or to drive electric vehicles, respectively (H1).

Second, partisan motivated reasoning and political polarization on climate change have fostered significant climate skepticism among Republicans (Druckman and McGrath 2019; Bolsen and Shapiro 2018; Zhou 2016). For instance, 83% of Democrats think global warming should be a high or very high priority for the president and Congress, but only 22% of Republicans think the same (Leiserowitz et al. 2020). I thus expect that a message about climate change will be less effective for Republicans than a message that does not discuss climate change (H2). Given Hai and

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[9]For both studies, I only preregistered hypotheses and research questions for Democrats and Republicans, as independents were unable to receive articles from co-partisan elites. (Independents received an article from an elite of randomly assigned partisanship.) For respondents' likelihood of installing solar panels (Study 1), I preregistered that I would only analyze results for homeowners, because non-homeowners are unlikely to install solar panels at their primary residence.

Perlman (2022)'s finding that climate change attribution by an official can harm that official's popularity among Republicans, I also test if a message about climate change actually makes Republicans *less* likely to install solar panels or to drive electric vehicles (RQ1a) and if a message about both climate change and costly action is less effective for Republicans than a message about only costly action (RQ1b).

Third, prior research on credibility-enhancing displays (CREDs) in the context of solar panel installation suggests that people may be more persuaded by a message promoting a costly action when the messenger is also engaging in the costly action (Kraft-Todd et al. 2018). As a result, I expect that a message about costly action by co-partisan elites will be more effective than a message that does not discuss costly action by co-partisan elites (H3). I also test if a message about both climate change and costly action is more effective for Republicans than a message about only climate change (RQ2).

For Democrats, it is unclear what the relative effects of these different cues will be, as they are all ideologically congruent with Democrats' prior beliefs. I thus test if a message about both climate change and costly action is more effective for Democrats than a message about only climate change or a message about only costly action (RQ3).

## Likelihood of participating in community solar (Study 1) or support for low-carbon transportation (Study 2)

I re-test all the hypotheses and research questions above using respondents' likelihood of participating in community solar or support for low-carbon transportation as as the outcome variable (RQ4). For Study 1, I also test if exposure to a pro-solar message from co-partisan officials makes non-homeowners more likely to participate in community solar than homeowners, as non-homeowners do not have the option of installing solar panels (RQ5).

**Belief in anthropogenic climate change (Study 1 and 2)**

Finally, based again on Zaller's RAS model as well as research showing that elite cues heavily shape beliefs about climate change, I expect that exposure to a pro-solar or pro-EV message from co-partisan officials about climate change makes people more likely to believe in anthropogenic climate change (H4) (Brulle, Carmichael and Jenkins 2012; Carmichael and Brulle 2017). I also test if a message about both climate change and costly action is more effective than a message about only climate change, and if these effects differ between Democrats and Republicans (RQ6).

# 3    Methods

Data collection occurred from March 1–March 22, 2022 for Study 1 and from September 30–October 15, 2022 for Study 2. Responses were collected using Lucid Theorem, which uses quotas to provide a nationally representative audience based on age, gender, ethnicity, and region.[10] Following my preregistered analysis plan, I dropped respondents under the age of 18, respondents who did not reside in the United States, and respondents who failed two pretreatment attention checks.[11] The final sample consisted of 9,298 respondents for Study 1 and 9,903 respondents for Study 2. The study was approved by the Committee for the Protection of Human Subjects at Dartmouth College.

As Figure 1 illustrates, respondents were randomized into one of five conditions in a between-subjects design for both studies. The first condition was a pure control in which respondents received no article at all. The four treatment conditions had respondents read a news article about

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[10]Researchers have successfully replicated various experiments on Lucid and concluded that the platform provides high-quality data (Coppock and McClellan 2019). Lucid Theorem has been used by many recently published survey experiments; see, e.g., Miller 2020; and Ternovski, Kalla and Aronow 2022 (who note that "Lucid is an increasingly popular alternative to Amazon Mechanical Turk for social science survey research"). On the other hand, Aronow et al. (2020) find some evidence of inattentiveness on Lucid and thus recommend that researchers utilize attention checks when collecting samples using Lucid. Following their recommendations, I do exactly that.

[11]The two attention checks were sourced from Pennycook et al. (2020), which used these same attention checks for their Lucid respondents.

co-partisan officials urging the public to install solar panels (Study 1) or to drive electric vehicles (Study 2):

- In the baseline message condition, the news article contained only the baseline pro-solar or pro-EV message from co-partisan elites, with no additional cues;

- In the climate message condition, the news article included a climate cue describing how co-partisan elites were promoting solar or EVs for the purpose of combating climate change;

- In the costly action message condition, the news article included a costly action cue describing how co-partisan elites were themselves installing solar panels or driving EVs; and

- In the combination message condition, the news article included both the climate cue and the costly action cue.

I fabricated the treatment articles for this survey experiment. As a result, I was able to maximize parallelism between the articles while varying only the cues of interest. The baseline pro-solar or pro-EV content of the articles was essentially identical; the inclusion of a climate cue and/or costly action cue was the only substantive difference. (To ensure the relevant cue was effectively conveyed, each article emphasized its cue three times: in the headline, the caption, and the body.) I was also able to eliminate potential form-based confounds by keeping constant the media outlet, author name, article date, and more. None of the treatment conditions were significantly different from each other in tone, length, or style. To enable comparison between the two studies, I kept the pro-solar and pro-EV articles as parallel as possible as well; with the exception of solar- or EV-related content, the articles and their cues were essential identically across studies.

I include the baseline message condition because my design is intended to test which cues from co-partisan elites are most effective. By including this condition in which respondents are exposed to a baseline pro-solar or pro-EV message without any reference to climate change or costly action, I can isolate the effect of the climate cue and the costly action cue and determine how well they fare compared to the baseline message. Comparing only against the pure control would not reveal

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Figure 1: Survey flow
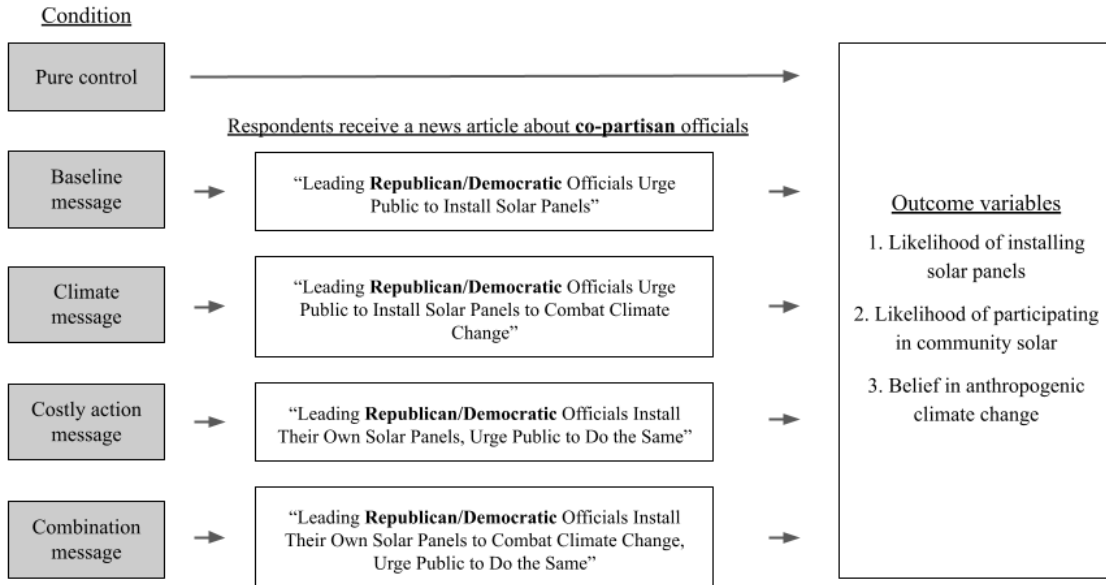


(a) Study 1: Solar panels
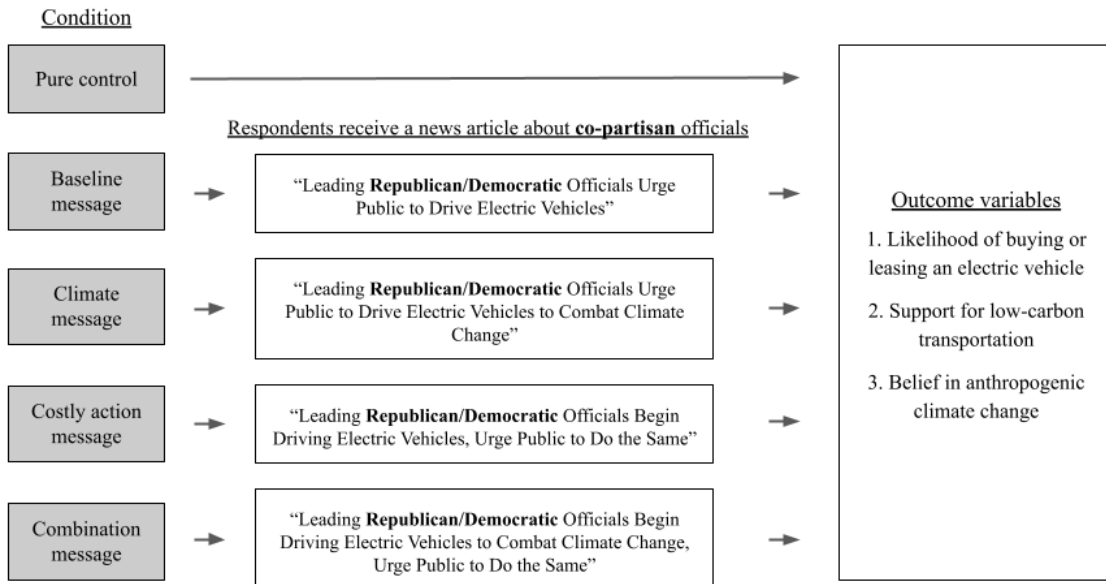


(b) Study 2: Electric vehicles

if attitudes were shifting *due to* or *despite* the additional cues beyond the pro-solar or pro-EV message. (See Chockalingam et al. (2021) on the importance of identifying the appropriate baseline for comparison in survey experiments).

Respondents always received an article about co-partisan elites: Democrats and Democrat leaners received an article about Democratic elected officials, while Republicans and Republican leaners received an article about Republican elected officials. (Pure independents received an article about an elected official of randomized partisanship.) Within treatment conditions, the articles were identical with the exception that the partisanship of the elected official was varied.

Despite their fictional nature, the articles strongly resembled real Associated Press publications, as shown in Figures 2 and 3.[12] According to a 2018 survey, Americans were most likely to rate PBS News and the Associated Press as being "not biased at all" or "not very biased" (Gallup and Knight Foundation 2018). I thus chose to mimic Associated Press articles in order to minimize media source effects and isolate the effects of partisan elite cues.[13]

To maximize external validity, the images chosen for the articles were sourced from real news articles about state governors advocating for solar panels or electric vehicles. In Figure 2, the image depicts former Governor Charlie Crist giving a press conference in front of solar panels. In Figure 3, the image depicts Governor Gavin Newsom giving a press conference in front of electric vehicles.[14]

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[12]In Study 1, 80% of Democrats and Republicans said they found their article "somewhat credible" or "very credible." In Study 2, 74% said the same. These percentages are quite high, especially considering that directly asking someone if they found the article they had just read to be "credible" may raise suspicions.

[13]For example, mimicking CNN articles may have caused many Republican respondents to disregard or perhaps not even read their treatment article; mimicking Fox News articles may have caused many Democratic respondents to do the same.

[14]One might worry that Republican respondents recognized the picture of Newsom and identified him as a Democratic governor, not a co-partisan Republican governor. Indeed, 18% of Republican respondents in Study 2 indicated that they thought the person in the image was a Democrat. However, when examining the composite scale, exploratory analyses omitting these respondents yield exactly the same results except for one difference (Online Appendix C). In the results section, I will identify where the result differs when omitting these respondents.

Figure 2: Examples of solar panel treatment articles from Study 1



(a) Republican climate message      (b) Republican costly action message

Figure 3: Examples of electric vehicle treatment articles from Study 2



(a) Republican climate message    (b) Republican costly action message

Before reading the articles, respondents answered questions regarding demographics and their attitudes toward solar panels, community solar,[15] and climate change (Study 1) or toward electric vehicles, low-carbon transportation, and climate change (Study 2). Next, respondents in the treatment conditions read the article to which they were randomly assigned. They then answered the outcome questions again. As shown in Figure 1, Study 1 contains three outcome variables: the respondent's likelihood of installing solar panels, likelihood of participating in community solar, and belief in anthropogenic climate change. Study 2 also contains three outcome variables: the respondent's likelihood of driving an electric vehicle, support for low-carbon transportation, and belief in anthropogenic climate change.

As shown in Figure 4, each outcome variable is composed of two to four individual measures. (The full survey instrument, including all treatment articles and exact wording for all measures, is provided in Online Appendix A.)[16]

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[15]Before answering questions about their attitudes toward community solar, respondents read a brief 3-sentence description of community solar adapted from the Department of Energy (n.d.): "Community solar is an alternative to installing solar panels at your residence. Community solar customers can either buy or lease a portion of the solar panels in an off-site solar panel array. They typically receive an electricity bill credit for electricity generated by their share of the community solar system."

[16]I use the wording of "in the next year" for multiple measures in an attempt to better capture respondents' true beliefs; a more vague or open-ended question wording may increase the likelihood of social desirability bias, compared to forcing respondents to concretize their response in the context of a specific timeframe.

Figure 4: Outcome measures

| Study number | Outcome variable | Measures |
|---|---|---|
| Study 1 | Likelihood of installing solar panels | 1. Install solar panels at primary residence in the next year |
| | | 2. Obtain a solar installation quote in the next year |
| | | 3. Willingness to receive more information about solar installation |
| | Likelihood of participating in community solar | 1. Participate in community solar in the next year |
| | | 2. Obtain a community solar quote in the next year |
| Study 2 | Likelihood of driving an electric vehicle | 1. Buy or lease an electric vehicle in the next year |
| | | 2. Visit a dealership or search online for electric vehicles in the next year |
| | | 3. Seriously consider an electric vehicle for the next vehicle purchase |
| | | 4. Receive more information about charging an electric vehicle at home |
| | Support for low-carbon transportation | 1. Likelihood of driving less in the next year |
| | | 2. Support incentives to increase the use of hybrid and electric vehicles |
| | | 3. Support phasing out the production of new gasoline cars/trucks by 2035 |
| Study 1 & Study 2 | Belief in anthropogenic climate change | 1. Estimated extent to which scientists agree about global warming |
| | | 2. Belief in the existence of global warming |
| | | 3. Beliefs regarding the causes of global warming |

I use factor analysis to create a composite scale for each variable based on factor scales from

the individual measures. For every variable, the individual measures loaded onto a single factor. Following conventional practices, I use a lasso variable selection procedure to determine the set of prognostic covariates to include in models for each dependent variable, as per Bloniarz et al. (2016). Pretreatment values of the outcome measures were included in the lasso, as per Clifford, Sheagley and Piston (2021) and Broockman, Kalla and Sekhon (2017). Statistical analyses were conducted using OLS regression with robust standard errors.

# 4    Results

Below, I discuss results based on the composite scales. However, I also report the individual measures in tables and figures.

## Study 1: Solar Panels

*Likelihood of installing solar panels*

Consistent with H1, I find that exposure to a pro-solar message from co-partisan officials makes homeowners more likely to install solar panels. As Figure 5a and Table B1 show, the baseline message, climate message, costly action message, and combination message all had significant effects for the pooled sample of homeowners (0.140, $p < 0.005$; 0.144, $p < 0.005$; 0.131, $p < 0.005$; and 0.129, $p < 0.005$, respectively). Effects remain significant for homeowners of each party separately, even though respondents might already have strong priors about the positions of their co-partisan elites on solar energy (Figures 5b and 5c and Table B2).

Even the climate message made Republicans more likely to install solar panels (RQ1a). In fact, contrary to H2, Republicans' likelihood of installing solar panels was just as affected by the climate message as by the baseline message ($p > 0.05$), as shown in Figure 5b and Table B2. Also, the combination message was not less effective than the costly action message for Republicans ($p > 0.05$) (RQ1b).

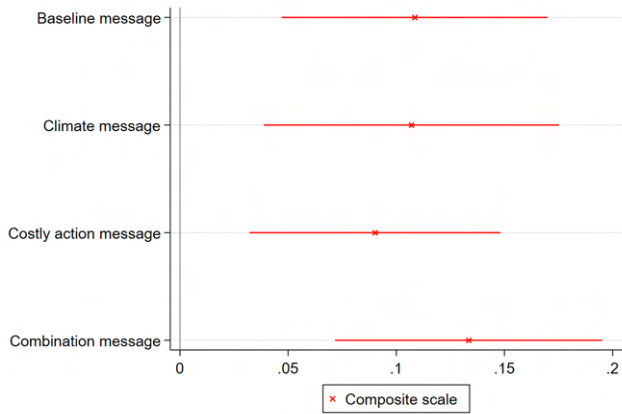Contrary to H3 and the literature on credibility-enhancing displays (CREDs), Figure 5a and

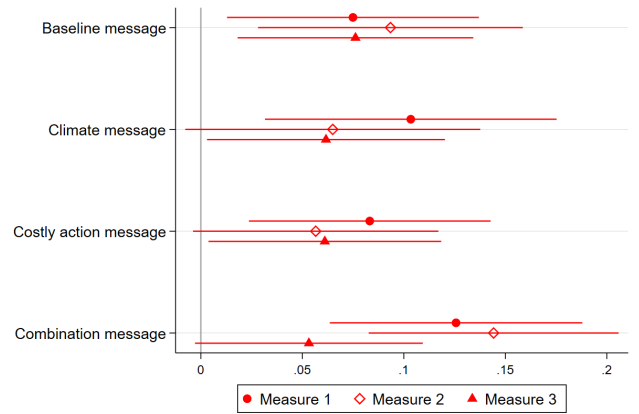Figure 5: Study 1 treatment effects on likelihood of installing solar panels
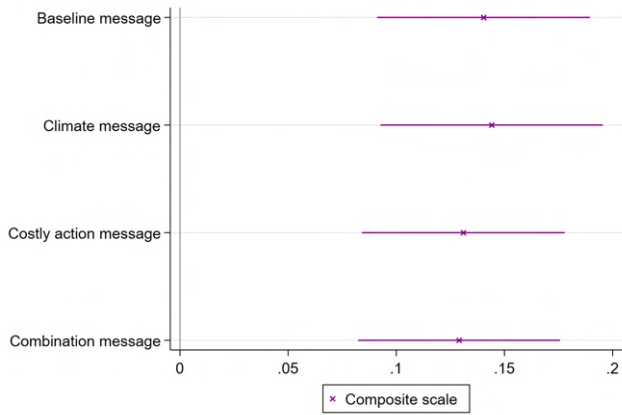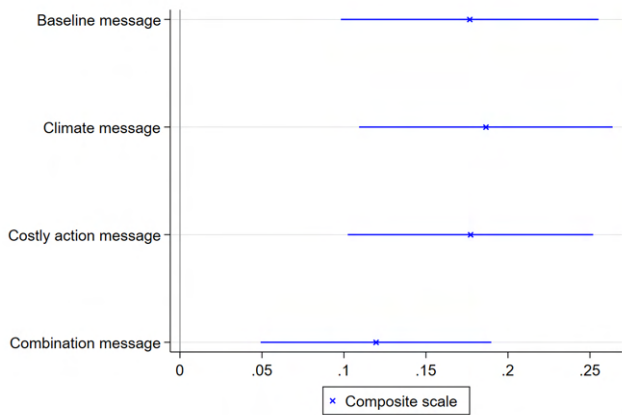
(a) Composite scale (pooled)
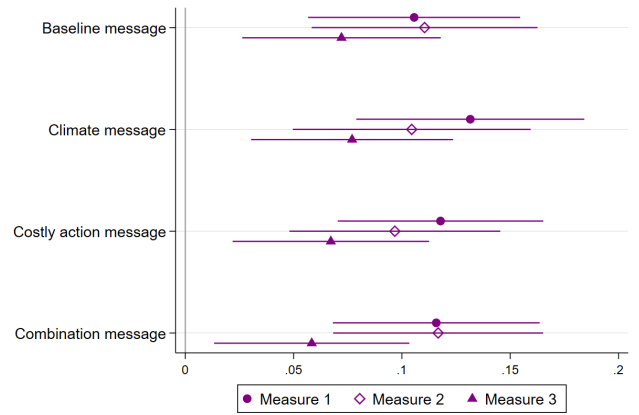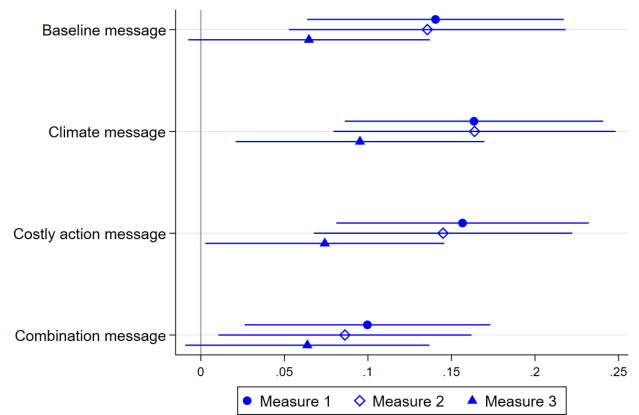
(d) Individual measures (pooled)

(b) Composite scale (Republicans)

(e) Individual measures (Republicans)

(c) Composite scale (Democrats)

(f) Individual measures (Democrats)

Estimates for which the confidence intervals do not intersect the vertical line at 0 represent statistically significant treatment effects at the 0.05 level relative to the pure control condition. The composite scale is based on factor scores from the individual measures.

Table B1 show that the costly action message is not more effective than the baseline message for the pooled sample of respondents ($p > 0.05$). This is also true for homeowners of each party separately (Figures 5b and 5c and Table B2). Furthermore, for Republicans, the combination message was not more effective than the climate message ($p > 0.05$) (RQ2); for Democrats, the combination message is just as effective as the costly action message or the climate message ($p > 0.05$ for both) (RQ3).

*Likelihood of participating in community solar*

For RQ4, I re-test the above hypotheses and research questions using respondents' likelihood of participating in community solar as the outcome variable. Figure 6a and Table B3 show that exposure to a pro-solar message from co-partisan officials makes people more likely to participate in community solar. The baseline message, climate message, costly action message, and combination message all had significant effects for the pooled sample (0.097, $p < 0.005$; 0.120, $p < 0.005$; 0.085, $p < 0.005$; and 0.076, $p < 0.005$, respectively). Effects remain significant for homeowners of each party separately, except for the baseline message for Republicans (Figures 6b and 6c and Table B4). Republicans exposed to the baseline message were not more likely to participate in community solar ($p > 0.05$).

Republicans' likelihood of participating in community solar was just as affected by the climate message as by the baseline message ($p > 0.05$), as shown in Figure 6b and Table B4. Also, the combination message was not less effective than the costly action message for Republicans ($p > 0.05$).

Again contrary to the literature on CREDs, Figures 6a-6c and Tables B3-B4 show that the costly action message was not more effective than the baseline message for the pooled sample of respondents or for respondents from each party separately ($p > 0.05$). Also, for Republicans, the combination message was not more effective than the climate message ($p > 0.05$); for Democrats, the combination message was just as effective as the costly action message or the climate message ($p > 0.05$ for both).
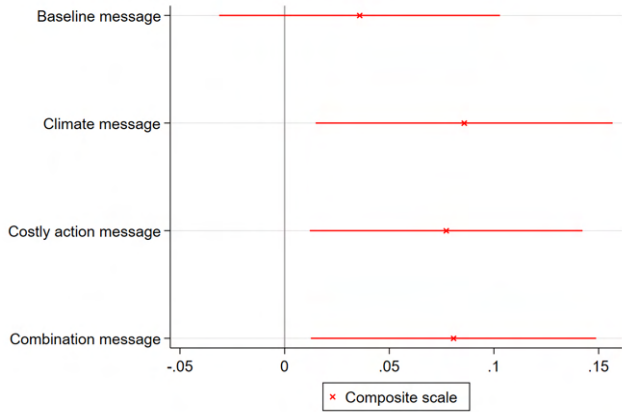
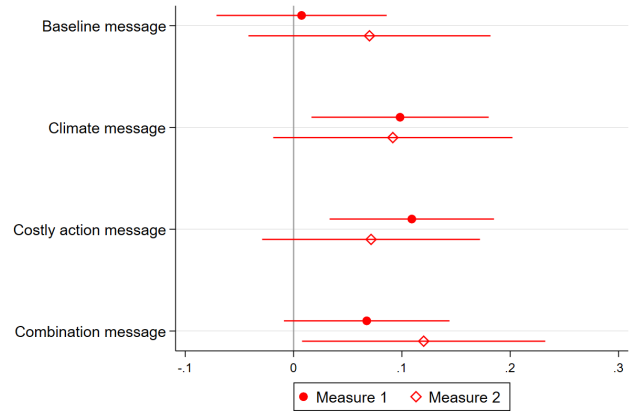Figure 6: Study 1 treatment effects on likelihood of participating in community solar
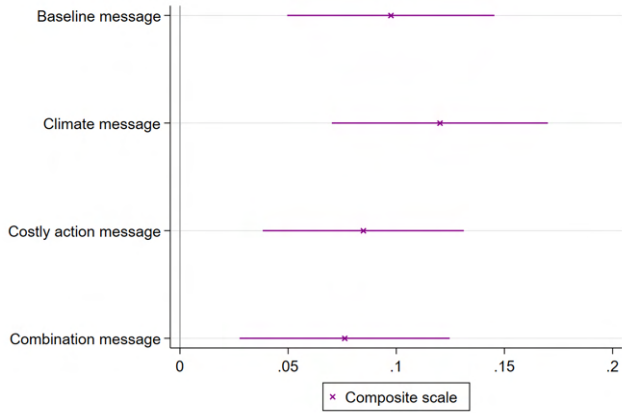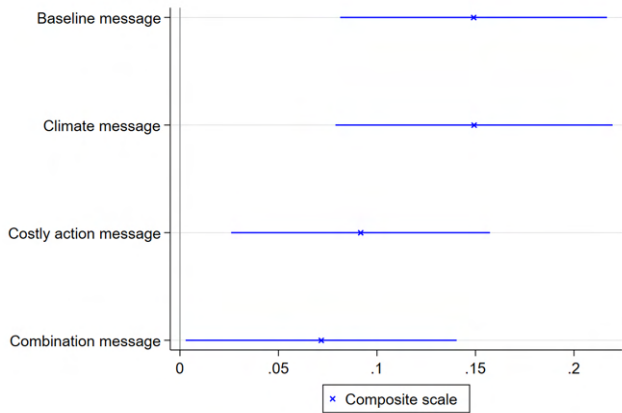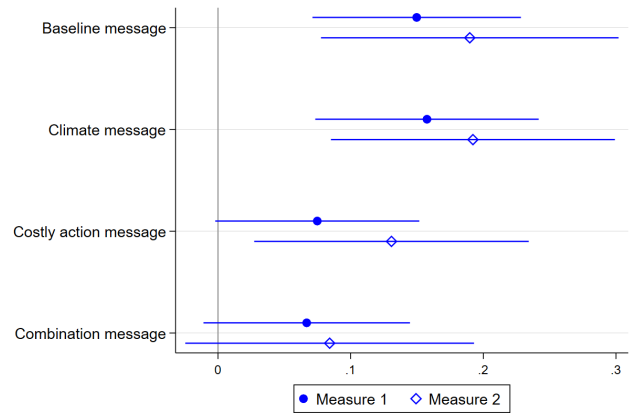


(a) Composite scale (pooled)
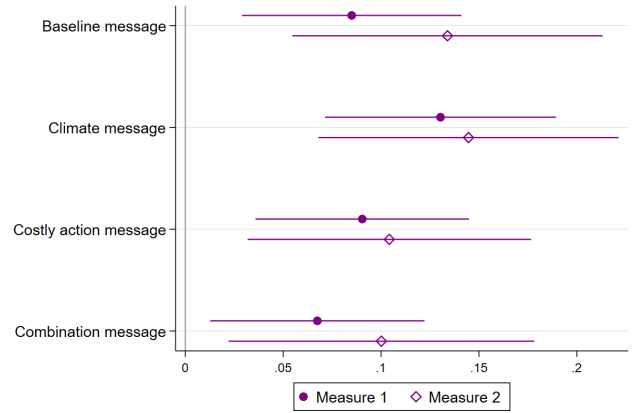
(b) Composite scale (Republicans)

(c) Composite scale (Democrats)

(d) Individual measures (pooled)

(e) Individual measures (Republicans)

(f) Individual measures (Democrats)

Estimates for which the confidence intervals do not intersect the vertical line at 0 represent statistically significant treatment effects at the 0.05 level relative to the pure control condition. The composite scale is based on factor scores from the individual measures.

I do not find any difference in treatment effects between homeowners and non-homeowners for any of the four messages (Table B5) (RQ5).

*Belief in anthropogenic climate change*

Consistent with H4, I find that exposure to a pro-solar message from co-partisan officials about climate change makes people more likely to believe in anthropogenic climate change. As Figure 7a and Table B6 show, the climate message had significant effects for the pooled sample of home-owners (0.032, $p < 0.05$). However, these effects are very small. Also, inconsistent with H4, the combination message (which also discussed climate change) did not make people more likely to believe in anthropogenic climate change ($p > 0.05$). Furthermore, as shown in Figures 7b and 7c and Table B7, effects are insignificant for Democrats and Republicans separately — neither the climate message nor the combination message affected beliefs in anthropogenic climate change when analyzing respondents from each party separately.

Contrary to the literature on CREDs, I do not find that the combination message is more effective than the climate message ($p > 0.05$); this is true of both Democrats and Republicans (Figures 7b and 7c and Table B7) (RQ6).

## Study 2: Electric Vehicles
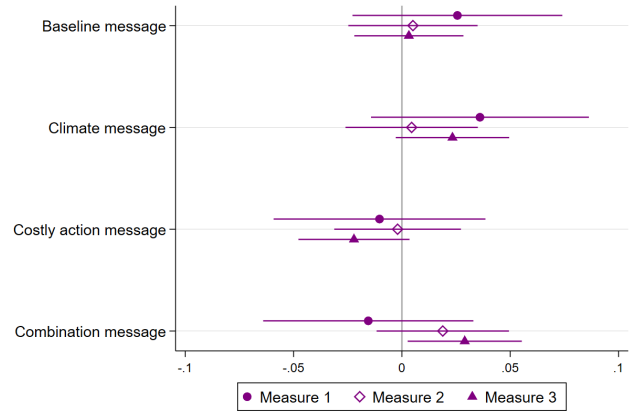
*Likelihood of driving an electric vehicle*

Consistent with H1, I find that exposure to a pro-EV message from co-partisan officials makes people more likely to drive electric vehicles. As Figure 8a and Table B8 show, the baseline message, climate message, costly action message, and combination message all had significant effects for the pooled sample of homeowners (0.049, $p < 0.005$; 0.046, $p < 0.01$; 0.069, $p < 0.005$; 0.073, $p < 0.005$). Effects remain significant for Democrats (Figure 8c and Table B9), but not for Republicans (Figure 8b and Table B9): no message shifted Republicans' likelihood of driving electric vehicles ($p > 0.05$).

As shown in Figure 8b and Table B9, there were no differences between the climate message
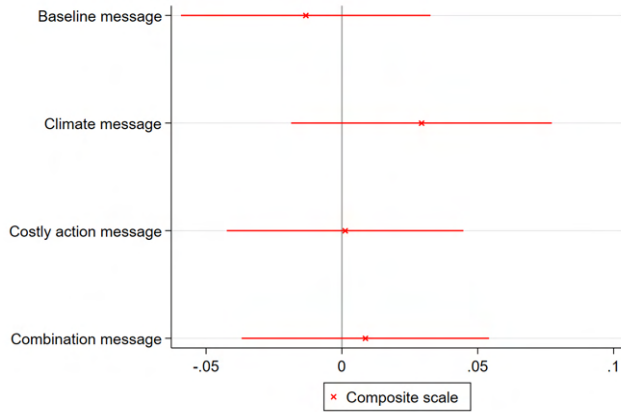
Figure 7: Study 1 treatment effects on belief in anthropogenic climate change
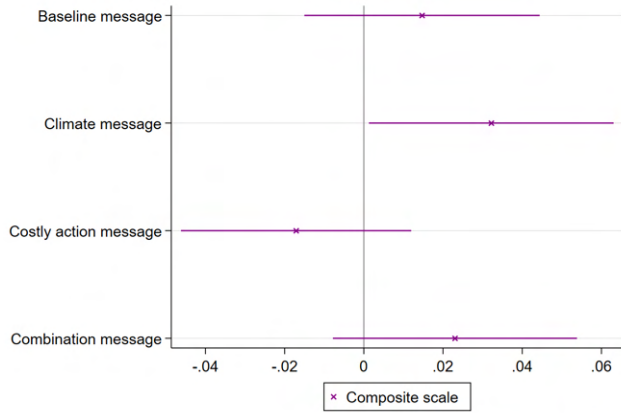


(a) Composite scale (pooled)

(d) Individual measures (pooled)

(b) Composite scale (Republicans)

(e) Individual measures (Republicans)

(c) Composite scale (Democrats)

(f) Individual measures (Democrats)

Estimates for which the confidence intervals do not intersect the vertical line at 0 represent statistically significant treatment effects at the 0.05 level relative to the pure control condition. The composite scale is based on factor scores from the individual measures.

Figure 8: Study 2 treatment effects on likelihood of driving an electric vehicle
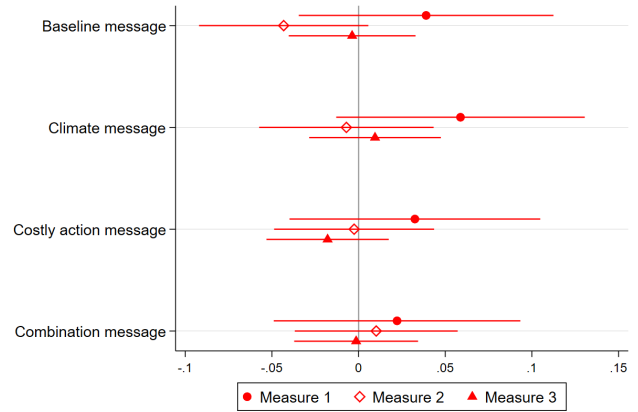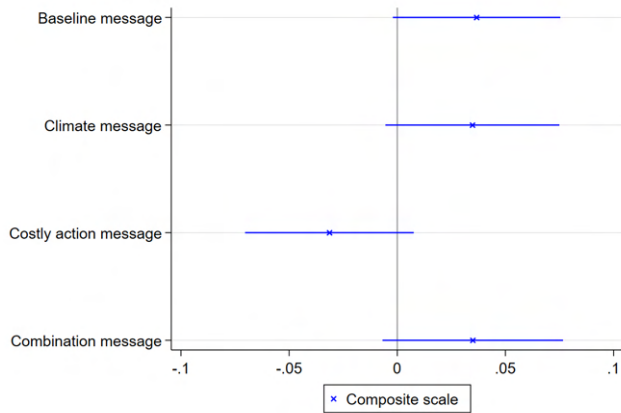


(a) Composite scale (pooled)
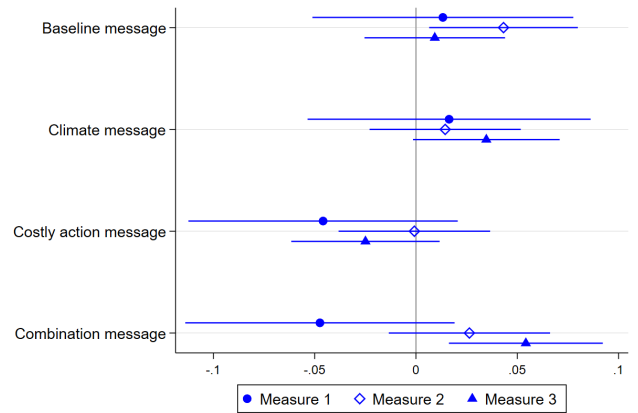
(d) Individual measures (pooled)

(b) Composite scale (Republicans)
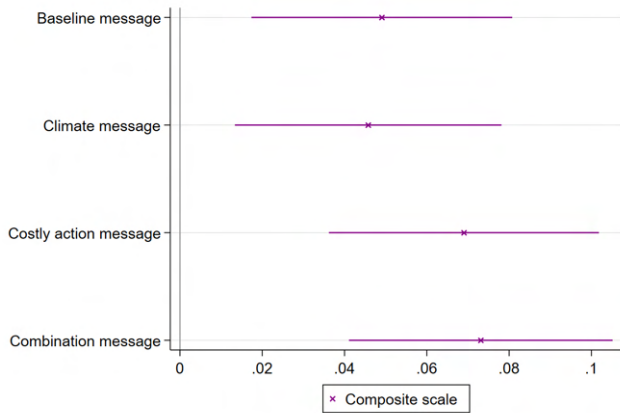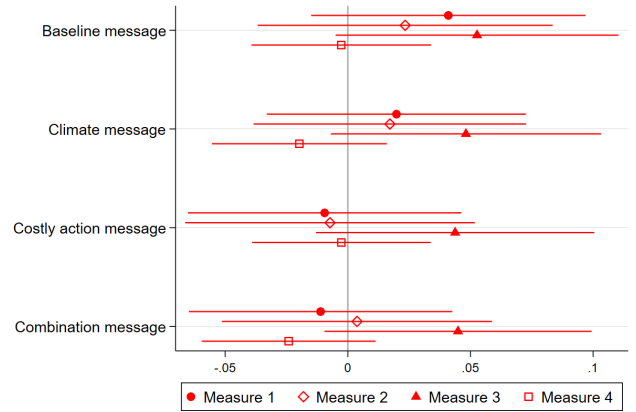
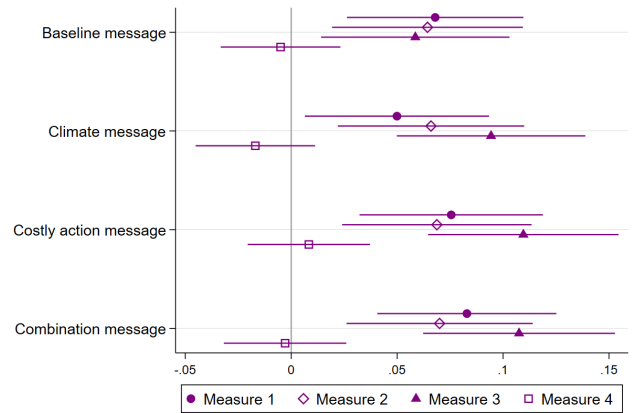(e) Individual measures (Republicans)

(c) Composite scale (Democrats)

(f) Individual measures (Democrats)

Estimates for which the confidence intervals do not intersect the vertical line at 0 represent statistically significant treatment effects at the 0.05 level relative to the pure control condition. The composite scale is based on factor scores from the individual measures.
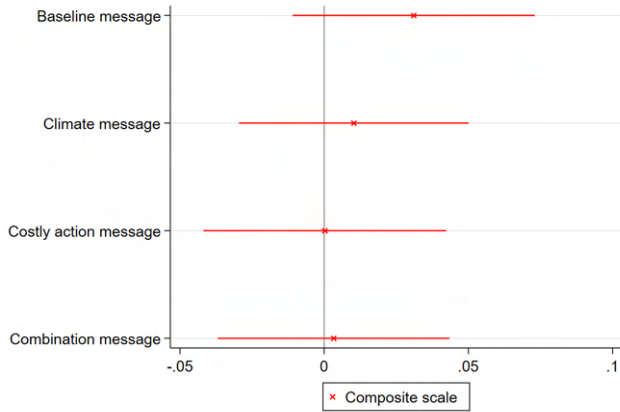
and the baseline message (H2) or the combination message and the costly action message (RQ1b) for Republicans: all were equally ineffective. Fortunately, the climate message did not make Republicans less likely to drive electric vehicles (RQ1a).

Again contrary to H3 and the literature on CREDs, Figure 8a and Table B8 show that the costly action message was not more effective than the baseline message for the pooled sample ($p > 0.05$). Effects remain null for Republicans; additionally, Figure 8b and Table B9 show that the combination message is not more effective than the climate message for Republicans ($p > 0.05$) (RQ2).

However, consistent with H3, Figure 8c and Table B9 show that for Democrats the costly action message is more effective than the baseline message (0.065, $p < 0.05$). Furthermore, for Democrats, the combination message is more effective than the climate message (0.059, $p < 0.05$) but not the costly action message ($p > 0.05$) (RQ3). This result suggests that for Democrats, the inclusion of a costly action cue makes a pro-EV message more effective but the inclusion of a climate cue does not.


*Support for low-carbon transportation*

For RQ4, I re-test the above hypotheses and research questions using respondents' support for low-carbon transportation as the outcome variable. First, Figure 9a and Table B10 show that exposure to some pro-EV messages from co-partisan officials makes people more supportive of low-carbon transportation. The costly action message and combination message had significant effects for the pooled sample (0.033, $p < 0.05$ and 0.039, $p < 0.05$, respectively). The baseline message and climate message had no effect on the pooled sample ($p > 0.05$). These results would seem to reinforce the effectiveness of CREDs, as the costly action message and combination message had statistically discernible impact relative to the pure control condition while the baseline message and climate message did not. However, the costly action message is not statistically discernible from the baseline message (Figure 9a and Table B11).

Also, all effects become null for Republicans and Democrats separately (Figures 9c and 9b and Table B11). (This result is explained by the greater sample size of the pooled sample resulting in more precise estimates, as the pooled sample is composed of only Democrats and Republicans.)

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Figure 9: Study 2 treatment effects on support for low-carbon transportation
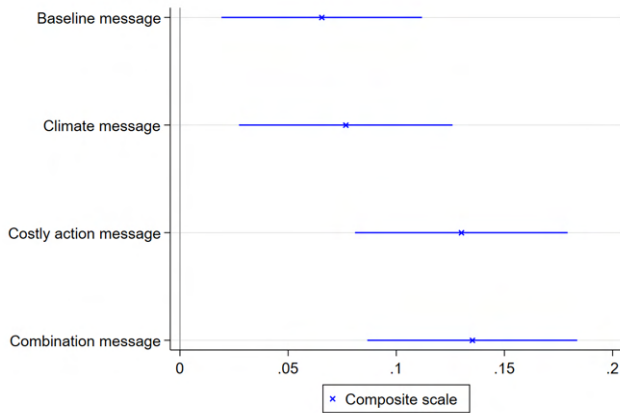


(a) Composite scale (pooled)
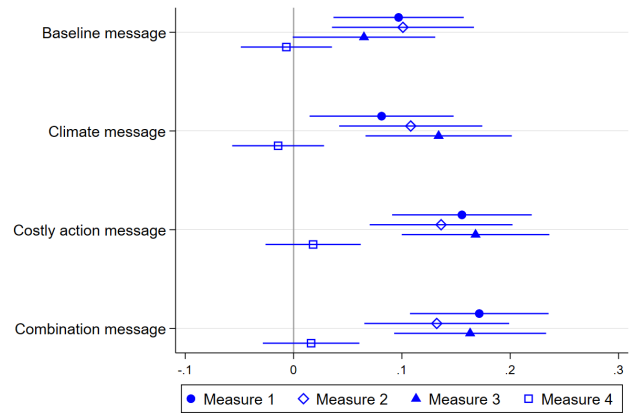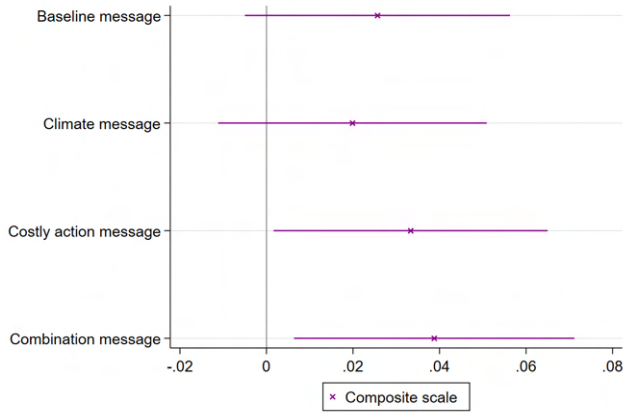
(d) Individual measures (pooled)

(b) Composite scale (Republicans)

(e) Individual measures (Republicans)

(c) Composite scale (Democrats)

(f) Individual measures (Democrats)

Estimates for which the confidence intervals do not intersect the vertical line at 0 represent statistically significant treatment effects at the 0.05 level relative to the pure control condition. The composite scale is based on factor scores from the individual measures.

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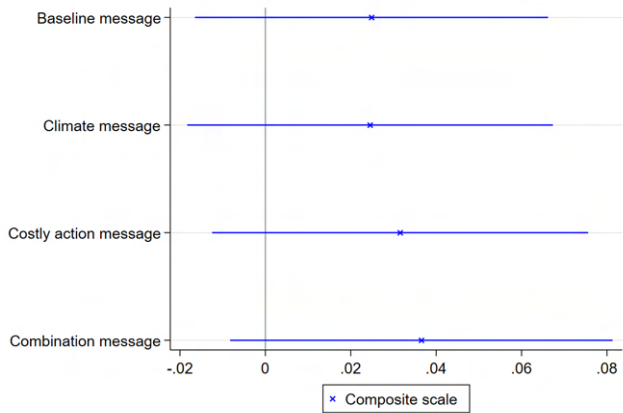
For both Republicans and Democrats, all messages were equally ineffective.[17]

However, I also conducted exploratory analyses that omit the 18% of Republican respondents who recognized a Democratic governor in their treatment article; in these exploratory analyses, all messages remained ineffective except for the costly action message (Figure C2b and Table C4). Thus, for Republicans who actually believed they were receiving a message about a co-partisan elite, only the costly action message successfully increased support for low-carbon transportation (0.055, $p < 0.05$). This finding reinforces the importance of CREDs and is especially noteworthy considering that all effects are null for Democrats.[18]

*Belief in anthropogenic climate change*

Inconsistent with H4 and the prior literature on the importance of elite cues in shaping public opinion, I do not find that exposure to a pro-EV message from co-partisan officials about climate change makes people more likely to believe in anthropogenic climate change. As Figure 10 and Table B12 show, neither the climate message nor the combination message affected the pooled sample ($p > 0.05$ for both). As shown in Figures 10b and 10c and Table B13, all effects remain insignificant for Democrats and Republicans separately. Priors regarding climate change may already be too strongly established to be influenced by a 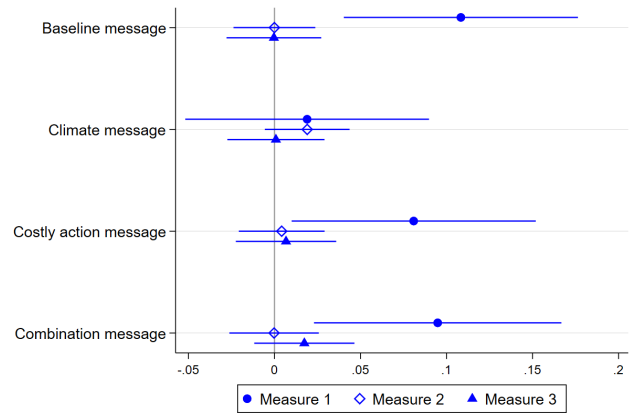brief treatment in a survey experiment. I also do not find that the combination message is more effective than the climate message ($p > 0.05$); this is

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[17]There was no difference between the climate message and the baseline message or the combination message and the costly action message for Republicans ($p > 0.05$ for both), as shown in Figure 6b and Table B4. Figures 9b-6c and Table B4 show that the costly action message was not more effective than the baseline message for respondents from each party separately ($p > 0.05$). Also, for Republicans, the combination message was not more effective than the climate message ($p > 0.05$); for Democrats, the combination message was just as effective as the costly action message or the climate message ($p > 0.05$ for both).

[18]In the exploratory analyses, the ineffectiveness of the combination message (which also includes the costly action cue) may be explained by the inclusion of a climate cue, which is ideologically incongruent for Republicans. On the other hand, Table C4 shows that the costly action message is not statistically discernible from the baseline or combination messages.

again true of both Democrats and Republicans (Figures 10b and 10c and Table B7) (RQ6).

# 5    Conclusion

I contribute in three ways to the literature on political communication for climate change and re-newable energy: I provide mixed empirical evidence for the ability of co-partisan elites to shift attitudes toward renewable energy, I find that climate-based messages are never less effective than other messages at motivating Republicans to install solar panels or drive electric vehicles, and I show that it is possible to induce emissions-reducing behavior changes without shifting attitudes toward climate change. I also contribute in two ways to the literature on political communication more generally: first, I increase external validity and credibility by using realistic news articles instead of text blocks to convey my treatment messages; second, I apply the theory of credibility-enhancing displays (CREDs) to politics and find limited evidence on the effectiveness of CREDs for co-partisan elites.

I provide mixed empirical evidence for the ability of co-partisan elites to shift attitudes toward renewable energy. I find that pro-solar messages made the pooled sample of respondents more likely to install solar panels and to participate in community solar, while pro-EV messages made the pooled sample of respondents more likely to drive an electric vehicle and sometimes to support low-carbon transportation. These results are generally consistent with prior research on the importance of co-partisan elite cues.

For Republicans, all pro-solar messages made them more likely to install solar panels — even the pro-solar message that described climate change mitigation as the rationale for installing solar panels. This finding is noteworthy and may suggest that climate change is becoming less of a polarizing issue, at least insofar as it affects Republicans' receptiveness to co-partisan elite cues regarding renewable energy. In other words, Republican elected officials can discuss climate change as a reason to support renewable energy, and their discussion of climate change will not necessarily reduce the persuasiveness of their message for fellow Republicans.

Figure 10: Study 2 treatment effects on belief in anthropogenic climate change
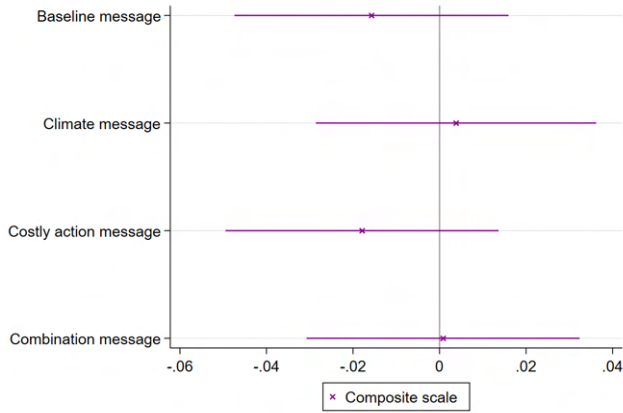
(a) Composite scale (pooled)

(d) Individual measures (pooled)

(b) Composite scale (Republicans)
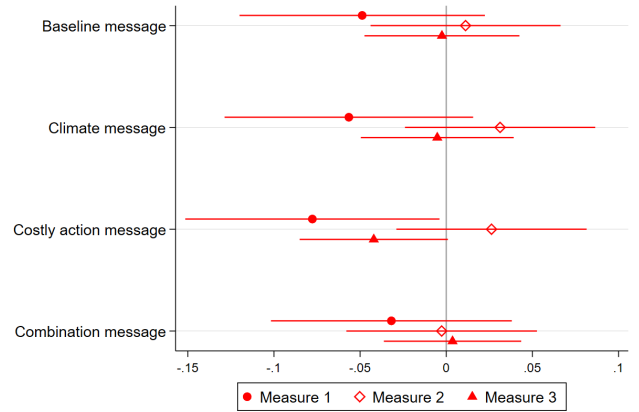
(e) Individual measures (Republicans)
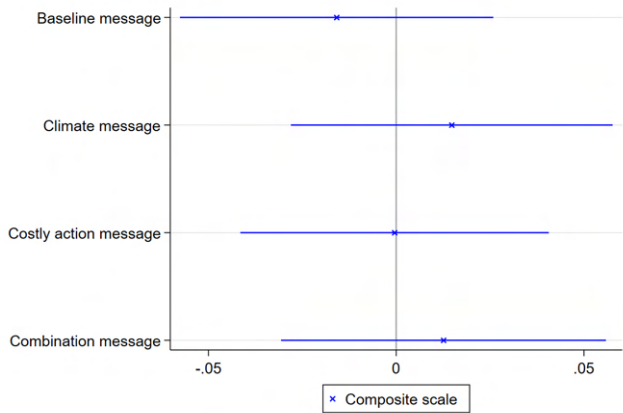
(c) Composite scale (Democrats)
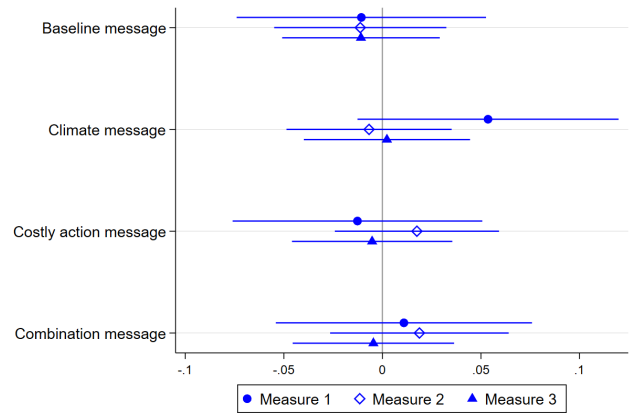
(f) Individual measures (Democrats)

Estimates for which the confidence intervals do not intersect the vertical line at 0 represent statistically significant treatment effects at the 0.05 level relative to the pure control condition. The composite scale is based on factor scores from the individual measures.

This finding contrasts with prior findings that mentioning climate change creates a "triggering" or "boomerang" effect (Hart and Nisbet 2012; Ma, Dixon and Hmielowski 2019; Zhou 2016). For instance, Diamond and Zhou (2022) concluded that "mentioning climate change could evoke negative affect among Republicans and eliminate any possible positive effect of the message," while Ma, Dixon and Hmielowski (2019) found that persuasive messages about climate change triggered psychological reactance, thereby reducing the effectiveness of the message. However, Diamond and Zhou (2022), Ma, Dixon and Hmielowski (2019), and Hart and Nisbet (2012) do not attribute their climate messages to Republican elites. Thus, I find that attributing the climate message to a Republican elite seems to counteract the boomerang effect of including the climate cue. Future research might further explore potential mechanisms by which source effects nullify psychological reactance.

On the other hand, Zhou (2016) does attribute some messages to a fictional "former Republican Party congressman" named "Jay Goreham." However, three key differences remain between our designs: 1) my treatment posited *current* Republican elites, not former; 2) my treatment described an "increasing number" of Republican elites, not one; and 3) my treatment used realistic news articles as vehicles for the messages, whereas Zhou (in keeping with much of the survey experiment literature) used unadorned blocks of text. All three differences may contribute to the effectiveness of my treatment. As discussed in the introduction, using realistic news articles likely increases external validity and credibility, which is especially important when trying to convince Republicans that their co-partisan elites are espousing ideologically incongruent views. In other words, our difference in results may be at least partially explained by a difference in how much respondents believed the treatments to be real. (80% of both Democrats and Republicans in Study 1 and 74% of both Democrats and Republicans in Study 2 said they found their treatment article "somewhat credible" or "very credible.")

Yet another potential explanation for these conflicting results is a difference in outcome variables. These prior researchers tested how messages affected support for policies, whereas I tested how messages affected specific personal behaviors (with the exception of two measures about pol-

icy for low-carbon transportation): Diamond and Zhou (2022) tested support for hypothetical clean energy bills, Hart and Nisbet (2012) tested support for climate mitigation policies, and Ma, Dixon and Hmielowski (2019) tested risk perceptions, climate change beliefs, and support for mitigation policies — none tested specific personal behaviors or behavioral intentions. Zhou (2016) tested support for government action and personal action, but Zhou's personal action variable referred not to a specific personal behavior but rather a more generalized set of acts: "joining an environmental organization, signing a petition, changing your consumption patterns, or changing your life habits." In contrast, my outcome measures took the form of specific and personal questions such as, "In the next year, how likely is it that you will install solar panels at your primary residence (the place where you usually live)?" Perhaps climate change is more polarizing in the context of legislative proposals or political acts, and less polarizing for everyday personal behaviors. Future research should seek to explore why Republicans might react more negatively to mentions of climate change when considering policy support rather than their own personal behaviors. The literature on behavioral spillover suggests some disconnect between the two; for instance, Lacroix et al. (2022) found that personal mitigation behaviors do not spill over to collective mitigation behaviors.

I also find that no pro-EV message made Republicans more likely to drive an electric vehicle. It is unclear from the survey experiments why Republicans view solar panels and electric vehicles differently, but this result is consistent with recent Pew Research polls showing that home solar panel adoption is more popular than electric vehicle purchases among Republicans: 36% of Republicans "have already installed" or "have given serious thought to installing" solar panels within the past 12 months, while only 23% of Republicans say they are very or somewhat likely to "seriously consider purchasing an electric vehicle the next time they purchase a vehicle" (Carey, Tyson and Spencer 2022; Leppert and Kennedy 2022). Similarly, 54% of Republicans say the federal government should encourage the production of wind and solar power, while only 28% of Republicans say it should encourage the use of electric vehicles (Tyson, Funk and Kennedy N.d.). Future research should explore possible differences in how Republicans perceive solar panels versus electric vehicles and if attitudes toward one are more polarized. Another possibility is that Republicans hold

stronger priors for their choice of vehicle than their choice of whether to install solar panels.[19]

I also find that none of the pro-solar or pro-EV messages from co-partisan elites affected Republicans' belief in anthropogenic climate change — not even the messages that described mitigating climate change as the rationale for the pro-solar or pro-EV message. This finding is consistent with prior research on partisan motivated reasoning and polarization on climate change. However, this finding offers some cause for hope when viewed in light of the previous set of findings: taken together, they reveal that co-partisan officials can induce certain emissions-reducing behavior changes without increasing belief in anthropogenic climate change. For instance, messages from Republican elected officials made Republicans more likely to install solar panels, even though those messages did not affect Republicans' belief in climate change. This shows that energy preferences have not become totally "entangled in climate change as a result of elite discourse," despite Hawes and Nowlin (2022)'s findings. Since partisan elite cues and motivated reasoning may present intractable challenges for changing factual beliefs on climate change, the urgency of the climate crisis requires communicative strategies that promote climate-friendly behavior change without necessarily changing factual beliefs on climate change.

I find limited evidence on the effectiveness of CREDs for co-partisan elites. Previous research shows that community organizers who engaged in CREDs were more likely to induce solar panel installation than community organizers who did not (Kraft-Todd et al. 2018). However, in Study 1, I find no evidence supporting the theory of CREDs: pro-solar messages that mentioned costly action by co-partisan elites were not more effective than the baseline message in terms of motivating people to install solar panels or participate in community solar. In Study 2, I find very limited evidence

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[19]Yet another alternative explanation is that the pro-EV treatment articles were less persuasive or credible than the pro-solar treatment articles for some reason other than their EV or solar content. However, as discussed in the methods section, I kept the pro-solar and pro-EV articles as parallel as possible. The picture of Gavin Newsom used for the pro-EV article is indeed likely more identifiable than the picture of Charlie Crist used for the pro-solar message; however, as discussed in the methods section, exploratory analyses omitting Republicans who recognized a Democratic governor in their treatment article yield exactly the same results except for one difference, which is noted in the results section (see Online Appendix C).

supporting the theory of CREDs: only Democrats seemed more responsive to costly action cues in terms of their likelihood of driving an electric vehicle.

Why might CREDs be less effective for elected officials, when prior research has demonstrated their effectiveness for community organizers? Perhaps members of the public feel they have less in common with partisan elites. For instance, any effect of increased credibility may be counteracted by a perception that solar panels and electric vehicles are only affordable for elites. (Furthermore, each treatment article specifically discussed state governors, who may be perceived as particularly affluent or powerful, e.g., in comparison with local officials.) Thus, I speculate that in some contexts, CREDs may be less effective when the advocate is insufficiently relatable: the benefit of a CRED may be in tension with ingroup/outgroup norms when one perceives oneself as meaningfully different from the advocate in some way.

This study has several limitations. First, in order to maximize parallelism and limit potential confounders, the articles did not name any specific partisan elites. However, this may have reduced the credibility of the articles. Though 80% of partisans in Study 1 and 74% of partisans in Study 2 indicated that they found the articles "Very credible" or "Somewhat credible," their perceptions of the treatments' persuasiveness may nevertheless have been influenced. Second, in order to maintain statistical power, I only showed respondents articles about co-partisan elites. Future research might consider showing respondents articles about opposition partisan elites, in order to test for a source-based "backfire effect." Third, I asked respondents about their behavioral intentions rather than measuring whether they actually went out and installed solar panels or bought an electric vehicle. I tried to measure something beyond stated intentions by asking if respondents wanted to receive more information about solar installation or about charging an electric vehicle at home, but future studies might consider even more direct ways of measuring actual behaviors.[20]

Ultimately, my combination of results offers a potentially optimistic conclusion: it is possible to promote climate-friendly behaviors, such as installing solar panels or driving electric vehicles,

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[20]I also tracked whether respondents who did want more information clicked on the link I provided, though I did not preregister this as a measure or include it in my analyses.

without changing factual beliefs on anthropogenic climate change. Additionally, these findings may be applicable to climate-friendly behaviors other than installing solar panels or driving electric vehicles; future research might attempt similar survey experiments on installing heat pumps, eating less meat, or limiting air travel. Future research might also explore the effect of CREDs in politics more broadly. As Kraft-Todd et al. (2018) note, solar energy is but one example of a public good that has not yet been widely adopted. My findings regarding the effects of CREDs may be broadly applicable to partisan elites' attempts to promote non-normative public goods.

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# 7 Online Appendix A: Survey Instrument

[Text in brackets indicates notes that the participants did not see.]

[The treatment articles were larger when presented to respondents; here, they are scaled down to fit on one page.]

**Study 1 Treatments: Pro-Solar Messages**



[Respondents assigned to the **baseline message condition** in Study 1 received one of these articles based on their partisanship (i.e., they received an article about a co-partisan elite).]

[Respondents assigned to the **climate message condition** in Study 1 received one of these articles based on their partisanship (i.e., they received an article about a co-partisan elite).]

[Respondents assigned to the **costly action message condition** in Study 1 received one of these articles based on their partisanship (i.e., they received an article about a co-partisan elite).]

## Left article

Coronavirus pandemic    Winter Olympics    Supreme Cou

**Leading Democratic Officials Install Their Own Solar Panels to Combat Climate Change, Urge Public to Do the Same**

By MARTIN JONES    November 30, 2021

In a speech on Friday, a Democratic governor recommends that members of the public install solar panels to combat climate change. He has installed solar panels at his own home.

An increasing number of Democratic elected officials have been urging the public to install solar panels on their houses. These are not just empty words – many Democratic officials have now backed up their public support for solar by installing solar panels at their own homes. They say that installing solar panels will help combat climate change because solar energy does not release harmful greenhouse gas emissions into the atmosphere.

In fact, Democratic governors in over a dozen states have purchased their own home solar energy systems to mitigate the rise in the world's temperatures. By following their own recommendation to install rooftop solar panels, they are demonstrating their commitment to residential solar. These Democratic governors cite the scientific consensus that climate change is a real threat caused by humans.

These leading Democratic officials recommend calling a solar installer for a quote or obtaining a quote online. They say that members of the public should strongly consider installing solar panels on their houses.

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## Right article

Coronavirus pandemic    Winter Olympics    Supreme Cou

**Leading Republican Officials Install Their Own Solar Panels to Combat Climate Change, Urge Public to Do the Same**

By MARTIN JONES    November 30, 2021

In a speech on Friday, a Republican governor recommends that members of the public install solar panels to combat climate change. He has installed solar panels at his own home.

An increasing number of Republican elected officials have been urging the public to install solar panels on their houses. These are not just empty words – many Republican officials have now backed up their public support for solar by installing solar panels at their own homes. They say that installing solar panels will help combat climate change because solar energy does not release harmful greenhouse gas emissions into the atmosphere.

In fact, Republican governors in over a dozen states have purchased their own home solar energy systems to mitigate the rise in the world's temperatures. By following their own recommendation to install rooftop solar panels, they are demonstrating their commitment to residential solar. These Republican governors cite the scientific consensus that climate change is a real threat caused by humans.

These leading Republican officials recommend calling a solar installer for a quote or obtaining a quote online. They say that members of the public should strongly consider installing solar panels on their houses.

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[Respondents assigned to the **combination message condition** in Study 1 received one of these articles based on their partisanship (i.e., they received an article about a co-partisan elite).]

## Study 2 Treatments: Pro-EV Messages



[Respondents assigned to the **baseline message condition** in Study 2 received one of these articles based on their partisanship (i.e., they received an article about a co-partisan elite).]

[Respondents assigned to the **climate message condition** in Study 2 received one of these articles based on their partisanship (i.e., they received an article about a co-partisan elite).]

[Respondents assigned to the **costly action message condition** in Study 2 received one of these articles based on their partisanship (i.e., they received an article about a co-partisan elite).]

[Respondents assigned to the **combination message condition** in Study 2 received one of these articles based on their partisanship (i.e., they received an article about a co-partisan elite).]

## Study 1 Outcome Measures

**[Likelihood of installing solar panels**]

[Display this question:
If Do you currently have solar panels installed at your primary residence (the place where you usual... != Yes
And Do you currently have a contract in place to install solar panels at your primary residence? != Yes]

In the next year, how likely is it that you will install solar panels at your primary residence (the place where you usually live)?

- Extremely likely

- Very likely

- Moderately likely

- A little likely

- Not at all likely

[Display this question:
If Do you currently have solar panels installed at your primary residence (the place where you usual... != Yes
And Do you currently have a contract in place to install solar panels at your primary residence? != Yes]

In the next year, how likely is it that you will call a solar installer for a quote or obtain a quote online?

- Extremely likely

- Very likely

- Moderately likely

- A little likely

- Not at all likely

[Display this question:
If Do you currently have solar panels installed at your primary residence (the place where you usual... != Yes
And Do you currently have a contract in place to install solar panels at your primary residence? != Yes]

Would you like to receive more information at the end of this survey about how to install solar panels at your primary residence?

- Yes

- No

**[Likelihood of participating in community solar**]

[Display this question:
If Is your electricity bill included directly in your rent? != Yes
And Do you currently participate in community solar? != Yes
And Is community solar available where you live? != No]

Community solar is an alternative to installing solar panels at your residence. Community solar customers can either buy or lease a portion of the solar panels in an off-site solar panel array. They typically receive an electricity bill credit for electricity generated by their share of the community solar system.
In the next year, how likely is it that you will participate in community solar?

- Extremely likely

- Very likely

- Moderately likely

- A little likely

- Not at all likely

[Display this question:
If Is your electricity bill included directly in your rent? != Yes
And Do you currently participate in community solar? != Yes
And Is community solar available where you live? != No]

In the next year, how likely is it that you will call for a quote or obtain a quote online regarding community solar options?

- Extremely likely

- Very likely

- Moderately likely

- A little likely

- Not at all likely

**[Belief in anthropogenic climate change**]

On a scale of 1 to 5, where 1 means "Near complete agreement" and 5 means "No agreement at all", to what extent do environmental scientists agree among themselves about the existence and causes of global warming?

- Extremely likely

- Very likely

- Moderately likely

- A little likely

- Not at all likely

You may have heard that the world's temperature may have been going up slowly over the past 100 years. What is your personal opinion on this? Do you think this probably has been happening, or do you think it probably has not been happening?

- Probably has been happening

- Probably has not been happening

[Display This Question:
If You may have heard that the world's temperature may have been going up slowly over the past 100 y... = Probably has been happening]

You indicated that you think the world's temperatures are increasing. Do you think that definitely has been happening or only probably has been happening?

- Definitely has been happening

- Probably has been happening

[Display This Question: If You may have heard that the world's temperature may have been going up slowly over the past 100 y... = Probably has not been happening]

You indicated that you think the world's temperatures are not increasing. Do you think that definitely has not been happening or only probably has not been happening?

- Definitely has not been happening

- Probably has not been happening

[Display This Question: If You may have heard that the world's temperature may have been going up slowly over the past 100 y... = Probably has been happening]

Do you think a rise in the world's temperatures is being caused mostly by human activity, mostly by natural causes, or about equally by human activity and by natural causes?

- Mostly by human activity

- Mostly by natural causes

- About equally by human activity and natural causes

[Display This Question: If You may have heard that the world's temperature may have been going up slowly over the past 100 y... = Probably has not been happening]

Assuming it's happening, do you think a rise in the world's temperatures is being caused mostly by human activity, mostly by natural causes, or about equally by human activity and by natural causes?

- Mostly by human activity

- Mostly by natural causes

- About equally by human activity and natural causes

## Study 2 Outcome Measures

**[Likelihood of driving an electric vehicle]**
[Display this question: If Do you currently own or lease an electric vehicle? != Yes]
In the next year, how likely is it that you will buy or lease an electric vehicle?

- Extremely likely

- Very likely

- Moderately likely

- A little likely

- Not at all likely

[Display this question: If Do you currently own or lease an electric vehicle? != Yes]
In the next year, how likely is it that you will visit a dealership or search online to look for electric vehicles?

- Extremely likely

- Very likely

- Moderately likely

- A little likely

- Not at all likely

[Display this question: If Do you currently own or lease an electric vehicle? != Yes]
The next time you purchase a vehicle, how likely are you to seriously consider purchasing an electric vehicle?

- Extremely likely

- Very likely

- Moderately likely

- A little likely

- Not at all likely

[Display this question: If Do you currently own or lease an electric vehicle? != Yes]
Would you like to receive more information at the end of this survey about how to charge an electric vehicle at home?

- Yes

- No

[**Support for low-carbon transportation**]
In the next year, how likely is it that you start driving less and using other forms of transportation more (such as walking, biking, carpooling, or taking public transportation)?

- Extremely likely

- Very likely

- Moderately likely

- A little likely

- Not at all likely

Do you favor or oppose providing incentives to increase the use of hybrid and electric vehicles?

- Extremely likely

- Very likely

- Moderately likely

- A little likely

- Not at all likely

Do you favor or oppose phasing out the production of new gasoline cars and trucks by the year 2035?

- Extremely likely

- Very likely

- Moderately likely

- A little likely

- Not at all likely

[**Belief in anthropogenic climate change**]
On a scale of 1 to 5, where 1 means "Near complete agreement" and 5 means "No agreement at all", to what extent do environmental scientists agree among themselves about the existence and causes of global warming?

- Extremely likely

- Very likely

- Moderately likely

- A little likely

- Not at all likely

You may have heard that the world's temperature may have been going up slowly over the past 100 years. What is your personal opinion on this? Do you think this probably has been happening, or do you think it probably has not been happening?

- Probably has been happening

- Probably has not been happening

[Display This Question:
If You may have heard that the world's temperature may have been going up slowly over the past 100 y... = Probably has been happening]

You indicated that you think the world's temperatures are increasing. Do you think that definitely has been happening or only probably has been happening?

- Definitely has been happening

- Probably has been happening

[Display This Question: If You may have heard that the world's temperature may have been going up slowly over the past 100 y... = Probably has not been happening]

You indicated that you think the world's temperatures are not increasing. Do you think that definitely has not been happening or only probably has not been happening?

- Definitely has not been happening

- Probably has not been happening

[Display This Question: If You may have heard that the world's temperature may have been going up slowly over the past 100 y... = Probably has been happening]

Do you think a rise in the world's temperatures is being caused mostly by human activity, mostly by natural causes, or about equally by human activity and by natural causes?

- Mostly by human activity

- Mostly by natural causes

- About equally by human activity and natural causes

[Display This Question: If You may have heard that the world's temperature may have been going up slowly over the past 100 y... = Probably has not been happening]

Assuming it's happening, do you think a rise in the world's temperatures is being caused mostly by human activity, mostly by natural causes, or about equally by human activity and by natural causes?

- Mostly by human activity

- Mostly by natural causes

- About equally by human activity and natural causes

## Study 1 and 2 Covariates

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

- Republican

- Democrat

- Independent

- Something else

Would you call yourself a strong Republican or a not very strong Republican? [if selected Republican]

- Strong

- Not very strong

Would you call yourself a strong Democrat or a not very strong Democrat? [if selected Democrat]

- Strong

- Not very strong

Do you think of yourself as closer to the Republican or Democratic party? [if selected Independent or Something else]

- Closer to the Republican Party

- Closer to the Democratic Party

- Neither

What is your sex?

- Male

- Female

What is the highest level of school you have completed or the highest degree you have received?

- Less than high school degree

- High school graduate (high school diploma or equivalent including GED)

- Some college but no degree

- Associate degree in college (2-year)

- Bachelor's degree in college (4-year)

- Master's degree

- Doctoral degree

- Professional degree (JD, MD)

Please check one or more categories below to indicate what race(s) you consider yourself to be.

- White

- Black or African American

- American Indian or Alaska Native

- Asian/Pacific Islander

- Multi-racial

- Other

Are you Spanish, Hispanic, or Latino or none of these?

- Spanish, Hispanic, or Latino

- None of these

How old are you?

- 18 - 24

- 25 - 34

- 35 - 44

- 45 - 54

- 55 - 64

- 65 - 74

- 75 - 84

- 85 or older

Are you very interested, moderately interested, or not at all interested in issues about environmental pollution?

- Very interested

- Moderately interested

- Not at all interested

Should federal spending on protecting the environment be increased, decreased, or kept the same?

- Increased

- Decreased

- Kept the same

Which of the following approaches would you prefer for addressing America's energy supply needs?

- Mostly developing alternative sources, such as wind, solar, and hydrogen technology

- A mix of expanding exploration and production of oil, coal, and natural gas, and developing alternative sources such as wind, solar, and hydrogen technology

- Mostly expanding exploration and production of oil, coal, and natural gas

When it comes to politics, would you describe yourself as liberal, conservative, or neither liberal nor conservative?

- Very conservative

- Somewhat conservative

- Slightly conservative

- Moderate; middle of the road

- Slightly liberal

- Somewhat liberal

- Very liberal

Generally, how interested are you in politics?

- Extremely interested

- Very interested

- Somewhat interested

- Not very interested

- Not at all interested

Did you vote in the last election?

- Yes

- No

How often would you say scientists do a good job conducting research?

- All or most of the time

- Some of the time

- Only a little of the time

- None of the time

How often would you say scientists provide fair and accurate information when communicating their research results to the public?

- All or most of the time

- Some of the time

- Only a little of the time

- None of the time

In the previous year, what was your total household income (before taxes)? If you're not sure of the specific number, please give your best guess.

- Less than $10,000

- $10,000 to $19,999

- $20,000 to $29,999

- $30,000 to $39,999

- $40,000 to $49,999

- $50,000 to $59,999

- $60,000 to $69,999

- $70,000 to $79,999

- $80,000 to $89,999

- $90,000 to $99,999

- $100,000 to $149,999

- $150,000 or more

In general, how much trust and confidence do you have in the mass media – such as newspapers, TV and radio – when it comes to reporting the news fully, accurately, and fairly?

- None at all

- Not very much

- Fair amount

- Great deal

Please indicate how much trust and confidence you have in the Associated Press when it comes to reporting the news fully, accurately, and fairly.

- None at all

- Not very much

- Fair amount

- Great deal

# 8 Online Appendix B: Supplemental Tables

## Study 1: Solar Panels

Table B1: Study 1 treatment effects on likelihood of installing solar panels (no partisan interactions)

|  | Composite scale | Measure 1 | Measure 2 | Measure 3 |
|---|---|---|---|---|
| Baseline message | 0.140*** | 0.106*** | 0.110*** | 0.072*** |
|  | (0.025) | (0.025) | (0.027) | (0.023) |
| Climate message | 0.144*** | 0.132*** | 0.105*** | 0.077*** |
|  | (0.026) | (0.027) | (0.028) | (0.024) |
| Costly action message | 0.131*** | 0.118*** | 0.097*** | 0.067*** |
|  | (0.024) | (0.024) | (0.025) | (0.023) |
| Combination message | 0.129*** | 0.116*** | 0.117*** | 0.058* |
|  | (0.024) | (0.024) | (0.025) | (0.023) |
| Republican | 0.003 | 0.065* | -0.020 | -0.002 |
|  | (0.023) | (0.027) | (0.024) | (0.019) |
| Controls | ✓ | ✓ | ✓ | ✓ |
| Constant | -0.963*** | -0.180** | -0.044 | -0.399*** |
|  | (0.085) | (0.069) | (0.061) | (0.053) |
| *Difference in treatment effects* |  |  |  |  |
| Costly action - baseline | -0.009 | 0.012 | -0.014 | -0.005 |
|  | (0.027) | (0.029) | (0.029) | (0.024) |
| $R^2$ | 0.76 | 0.76 | 0.79 | 0.11 |
| N | 3198 | 3139 | 3213 | 3191 |

* $p < 0.05$, ** $p < 0.01$, *** $p < .005$ (two-sided). OLS models with robust standard errors. The sample here consists of Republican and Democratic homeowners who do not currently have solar panels installed at their primary residence or a contract in place to install solar panels at their primary residence. The composite scale is based on factor scores from the individual measures. Measure 1 refers to the respondent's likelihood of installing solar panels at their primary residence in the next year. Measure 2 refers to the respondent's likelihood of calling a solar installer for a quote or obtaining a quote online in the next year. Measure 3 refers to whether the respondent indicated that they would like to receive more information at the end of the survey about how to install solar panels at their primary residence.

Table B2: Study 1 treatment effects on likelihood of installing solar panels (partisan interactions)

| | Composite scale | Measure 1 | Measure 2 | Measure 3 |
|---|---|---|---|---|
| Baseline message | 0.177*** | 0.140*** | 0.136*** | 0.065 |
| | (0.040) | (0.039) | (0.042) | (0.037) |
| Climate message | 0.187*** | 0.163*** | 0.164*** | 0.095* |
| | (0.039) | (0.039) | (0.043) | (0.038) |
| Costly action message | 0.177*** | 0.157*** | 0.145*** | 0.074* |
| | (0.038) | (0.039) | (0.039) | (0.036) |
| Combination message | 0.120*** | 0.100** | 0.086* | 0.064 |
| | (0.036) | (0.037) | (0.039) | (0.037) |
| Republican | 0.047 | 0.098*** | 0.029 | 0.006 |
| | (0.034) | (0.033) | (0.035) | (0.035) |
| Republican × baseline message | -0.068 | -0.066 | -0.042 | 0.011 |
| | (0.051) | (0.050) | (0.054) | (0.047) |
| Republican × climate message | -0.080 | -0.060 | -0.099 | -0.034 |
| | (0.052) | (0.054) | (0.057) | (0.048) |
| Republican × costly action message | -0.087 | -0.073 | -0.088 | -0.013 |
| | (0.048) | (0.049) | (0.050) | (0.047) |
| Republican × combination message | 0.014 | 0.026 | 0.058 | -0.011 |
| | (0.048) | (0.049) | (0.050) | (0.047) |
| Controls | ✓ | ✓ | ✓ | ✓ |
| Constant | -0.985*** | -0.179* | -0.099 | -0.402*** |
| | (0.087) | (0.073) | (0.067) | (0.056) |
| *Treatment effects for Republicans* | | | | |
| Baseline message | 0.108*** | 0.075* | 0.093** | 0.076* |
| | (0.031) | (0.032) | (0.033) | (0.030) |
| Climate message | 0.107*** | 0.103** | 0.065 | 0.062* |
| | (0.035) | (0.037) | (0.037) | (0.030) |
| Costly action message | 0.090*** | 0.083** | 0.057 | 0.061* |
| | (0.030) | (0.030) | (0.031) | (0.029) |
| Combination message | 0.133*** | 0.126*** | 0.144*** | 0.053 |
| | (0.031) | (0.032) | (0.031) | (0.029) |
| *Difference in treatment effects* | | | | |
| Republican | | | | |
| Climate - baseline | -0.001 | 0.028 | -0.028 | -0.015 |
| | (0.039) | (0.042) | (0.043) | (0.031) |
| Costly action - baseline | -0.018 | 0.008 | -0.037 | -0.015 |
| | (0.034) | (0.036) | (0.038) | (0.030) |
| Combination - costly action | 0.043 | 0.043 | 0.088* | -0.008 |
| | (0.034) | (0.036) | (0.037) | (0.030) |
| Combination - climate | 0.026 | 0.022 | 0.079 | -0.008 |
| | (0.039) | (0.042) | (0.042) | (0.030) |
| Democrat | | | | |
| Costly action - baseline | 0.000 | 0.016 | 0.009 | 0.009 |
| | (0.044) | (0.046) | (0.045) | (0.037) |
| Combination - costly action | -0.058 | -0.057 | -0.059 | -0.010 |
| | (0.040) | (0.045) | (0.042) | (0.037) |
| Combination - climate | -0.067 | -0.064 | -0.078 | -0.032 |
| | (0.041) | (0.045) | (0.045) | (0.039) |
| $R^2$ | 0.76 | 0.76 | 0.79 | 0.11 |
| N | 3198 | 3139 | 3238 | 3189 |

* $p < 0.05$, ** $p < 0.01$, *** $p < .005$ (two-sided). OLS models with robust standard errors. The sample here consists of Republican and Democratic homeowners who do not currently have solar panels installed at their primary residence or a contract in place to install solar panels at their primary residence. The composite scale is based on factor scores from the individual measures. Measure 1 refers to the respondent's likelihood of installing solar panels at their primary residence in the next year. Measure 2 refers to the respondent's likelihood of calling a solar installer for a quote or obtaining a quote online in the next year. Measure 3 refers to whether the respondent indicated that they would like to receive more information at the end of the survey about how to install solar panels at their primary residence.

Table B3: Study 1 treatment effects on likelihood of participating in community solar (no partisan interactions)

|  | Composite scale | Measure 1 | Measure 2 |
|---|---|---|---|
| Baseline message | 0.097*** | 0.085*** | 0.134*** |
|  | (0.024) | (0.029) | (0.040) |
| Climate message | 0.120*** | 0.130*** | 0.145*** |
|  | (0.025) | (0.030) | (0.039) |
| Costly action message | 0.085*** | 0.090*** | 0.104*** |
|  | (0.024) | (0.028) | (0.037) |
| Combination message | 0.076*** | 0.067* | 0.100* |
|  | (0.025) | (0.028) | (0.040) |
| Republican | -0.039 | -0.048 | -0.042 |
|  | (0.026) | (0.031) | (0.033) |
| Controls | ✓ | ✓ | ✓ |
| Constant | -0.630*** | -0.191 | 0.219* |
|  | (0.106) | (0.102) | (0.099) |
| *Difference in treatment effects* |  |  |  |
| Costly action - baseline | -0.013 | 0.005 | -0.030 |
|  | (0.025) | (0.030) | (0.041) |
| $R^2$ | 0.72 | 0.72 | 0.57 |
| N | 4156 | 4121 | 4171 |

* $p < 0.05$, ** $p < 0.01$, *** $p < .005$ (two-sided). OLS models with robust standard errors. The sample here consists of Republicans and Democrats who do not currently participate in community solar, responded either "Yes" or "I don't know" to "Is community solar available where you live," and do not have electricity bills included directly in their rent (if they rent their primary residence). The composite scale is based on factor scores from the individual measures. Measure 1 refers to the respondent's likelihood of participating in community solar in the next year. Measure 2 refers to the respondent's likelihood of calling for a quote or obtaining a quote online regarding community solar options in the next year.

Table B4: Study 1 treatment effects on likelihood of participating in community solar (partisan interactions)

| | Composite scale | Measure 1 | Measure 2 |
|---|---|---|---|
| Baseline message | 0.149*** | 0.150*** | 0.190*** |
| | (0.035) | (0.040) | (0.057) |
| Climate message | 0.149*** | 0.158*** | 0.192*** |
| | (0.036) | (0.043) | (0.055) |
| Costly action message | 0.092** | 0.075 | 0.131* |
| | (0.034) | (0.039) | (0.053) |
| Combination message | 0.072* | 0.067 | 0.084 |
| | (0.035) | (0.040) | (0.056) |
| Republican | -0.003 | -0.016 | 0.007 |
| | (0.038) | (0.046) | (0.056) |
| Republican × baseline message | -0.113* | -0.142* | -0.120 |
| | (0.049) | (0.057) | (0.081) |
| Republican × climate message | -0.063 | -0.059 | -0.101 |
| | (0.051) | (0.060) | (0.079) |
| Republican × costly action message | -0.015 | 0.034 | -0.059 |
| | (0.047) | (0.055) | (0.074) |
| Republican × combination message | 0.009 | 0.001 | 0.036 |
| | (0.049) | (0.056) | (0.080) |
| Controls | ✓ | ✓ | ✓ |
| Constant | -0.652*** | -0.215* | 0.198 |
| | (0.107) | (0.102) | (0.103) |
| *Treatment effects for Republicans* | | | |
| Baseline message | 0.036 | 0.007 | 0.070 |
| | (0.034) | (0.040) | (0.057) |
| Climate message | 0.086* | 0.098* | 0.092 |
| | (0.036) | (0.042) | (0.056) |
| Costly action message | 0.077* | 0.109** | 0.072 |
| | (0.033) | (0.039) | (0.051) |
| Combination message | 0.081* | 0.068 | 0.120* |
| | (0.035) | (0.039) | (0.057) |
| *Difference in treatment effects* | | | |
| Republican | | | |
| Climate - baseline | 0.050 | 0.091* | 0.022 |
| | (0.039) | (0.045) | (0.062) |
| Costly action - baseline | 0.041 | 0.102* | 0.001 |
| | (0.036) | (0.042) | (0.058) |
| Combination - costly action | 0.004 | -0.042 | 0.049 |
| | (0.037) | (0.041) | (0.058) |
| Combination - climate | -0.005 | -0.031 | 0.028 |
| | (0.040) | (0.044) | (0.063) |
| Democrat | | | |
| Costly action - baseline | -0.057 | -0.075 | -0.059 |
| | (0.035) | (0.043) | (0.058) |
| Combination - costly action | -0.020 | -0.008 | -0.047 |
| | (0.036) | (0.042) | (0.056) |
| Combination - climate | -0.078* | -0.091* | -0.108 |
| | (0.038) | (0.046) | (0.058) |
| R² | 0.73 | 0.72 | 0.57 |
| N | 4156 | 4121 | 4166 |

* $p < 0.05$, ** $p < 0.01$, *** $p < .005$ (two-sided). OLS models with robust standard errors. The sample here consists of Republicans and Democrats who do not currently participate in community solar, responded either "Yes" or "I don't know' to "Is community solar available where you live," and do not have electricity bills included directly in their rent (if they rent their primary residence). The composite scale is based on factor scores from the individual measures. Measure 1 refers to the respondent's likelihood of participating in community solar in the next year. Measure 2 refers to the respondent's likelihood of calling for a quote or obtaining a quote online regarding community solar options in the next year.

Table B5: Study 1 treatment effects on likelihood of participating in community solar (homeowner interactions)

|  | Composite scale | Measure 1 | Measure 2 |
|---|---|---|---|
| Baseline message | 0.126*** | 0.110* | 0.175** |
|  | (0.041) | (0.049) | (0.067) |
| Climate message | 0.122*** | 0.125** | 0.156** |
|  | (0.041) | (0.048) | (0.060) |
| Costly action message | 0.109** | 0.134*** | 0.118 |
|  | (0.039) | (0.044) | (0.062) |
| Combination message | 0.076 | 0.085 | 0.078 |
|  | (0.040) | (0.045) | (0.064) |
| Republican | -0.039 | -0.049 | -0.041 |
|  | (0.026) | (0.031) | (0.033) |
| Homeowner | 0.018 | 0.045 | -0.009 |
|  | (0.033) | (0.037) | (0.052) |
| Homeowner × baseline message | -0.051 | -0.048 | -0.067 |
|  | (0.051) | (0.059) | (0.083) |
| Homeowner × climate message | -0.003 | 0.011 | -0.017 |
|  | (0.052) | (0.061) | (0.079) |
| Homeowner × costly action message | -0.045 | -0.080 | -0.027 |
|  | (0.048) | (0.056) | (0.076) |
| Homeowner × combination message | 0.000 | -0.034 | 0.047 |
|  | (0.050) | (0.057) | (0.081) |
| Controls | ✓ | ✓ | ✓ |
| Constant | -0.635*** | -0.217* | 0.218* |
|  | (0.107) | (0.100) | (0.102) |
| $R^2$ | 0.72 | 0.72 | 0.57 |
| N | 4156 | 4121 | 4166 |

* $p < 0.05$, ** $p < 0.01$, *** $p < .005$ (two-sided). OLS models with robust standard errors. The sample here consists of Republicans and Democrats who do not currently participate in community solar, responded either "Yes" or "I don't know" to "Is community solar available where you live," and do not have electricity bills included directly in their rent (if they rent their primary residence). The composite scale is based on factor scores from the individual measures. Measure 1 refers to the respondent's likelihood of participating in community solar in the next year. Measure 2 refers to the respondent's likelihood of calling for a quote or obtaining a quote online regarding community solar options in the next year.

Table B6: Study 1 treatment effects on belief in anthropogenic climate change (no partisan interactions)

| | Composite scale | Measure 1 | Measure 2 | Measure 3 |
|---|---|---|---|---|
| Baseline message | 0.015 | 0.026 | 0.005 | 0.003 |
| | (0.015) | (0.025) | (0.015) | (0.013) |
| Climate message | 0.032* | 0.036 | 0.004 | 0.023 |
| | (0.016) | (0.026) | (0.016) | (0.013) |
| Costly action message | -0.017 | -0.010 | -0.002 | -0.022 |
| | (0.015) | (0.025) | (0.015) | (0.013) |
| Combination message | 0.023 | -0.016 | 0.019 | 0.029* |
| | (0.016) | (0.025) | (0.016) | (0.013) |
| Republican | -0.003 | 0.024 | -0.007 | -0.034** |
| | (0.016) | (0.026) | (0.016) | (0.013) |
| Controls | ✓ | ✓ | ✓ | ✓ |
| Constant | -0.889*** | 0.177* | 0.565*** | 0.094* |
| | (0.100) | (0.086) | (0.054) | (0.036) |
| *Difference in treatment effects* | | | | |
| Combination - climate | -0.009 | -0.052 | 0.014 | 0.006 |
| | (0.017) | (0.027) | (0.016) | (0.015) |
| $R^2$ | 0.81 | 0.64 | 0.67 | 0.73 |
| N | 7512 | 7526 | 7574 | 7556 |

* $p < 0.05$, ** $p < 0.01$, *** $p < .005$ (two-sided). OLS models with robust standard errors. The sample here consists of Republicans and Democrats. The composite scale is based on factor scores from the individual measures. Measure 1 refers to the respondent's beliefs regarding the extent to which environmental scientists agree among themselves about the existence and causes of global warming. Measure 2 refers to the respondent's beliefs regarding whether or not the world's temperatures are increasing. Measure 3 refers to the respondent's beliefs regarding whether the rise in the world's temperatures is being caused mostly by human activity or mostly by natural causes.

Table B7: Study 1 treatment effects on belief in anthropogenic climate change (partisan interactions)

|  | Composite scale | Measure 1 | Measure 2 | Measure 3 |
|---|---|---|---|---|
| Baseline message | 0.037 | 0.013 | 0.043* | 0.009 |
|  | (0.020) | (0.033) | (0.019) | (0.018) |
| Climate message | 0.035 | 0.016 | 0.014 | 0.035 |
|  | (0.021) | (0.036) | (0.019) | (0.018) |
| Costly action message | -0.031 | -0.046 | -0.001 | -0.025 |
|  | (0.020) | (0.034) | (0.019) | (0.019) |
| Combination message | 0.035 | -0.047 | 0.026 | 0.054** |
|  | (0.021) | (0.034) | (0.020) | (0.019) |
| Republican | 0.007 | -0.020 | 0.017 | -0.016 |
|  | (0.024) | (0.039) | (0.024) | (0.019) |
| Republican × baseline message | -0.050 | 0.026 | -0.086** | -0.013 |
|  | (0.031) | (0.050) | (0.031) | (0.026) |
| Republican × climate message | -0.005 | 0.042 | -0.021 | -0.025 |
|  | (0.032) | (0.051) | (0.032) | (0.027) |
| Republican × costly action message | 0.033 | 0.078 | -0.002 | 0.007 |
|  | (0.030) | (0.050) | (0.030) | (0.026) |
| Republican × combination message | -0.026 | 0.070 | -0.016 | -0.056* |
|  | (0.031) | (0.050) | (0.031) | (0.027) |
| Controls | ✓ | ✓ | ✓ | ✓ |
| Constant | -0.901*** | 0.200* | 0.551*** | 0.084* |
|  | (0.099) | (0.087) | (0.054) | (0.037) |
| *Treatment effects for Republicans* |  |  |  |  |
| Baseline message | -0.013 | 0.039 | -0.043 | -0.004 |
|  | (0.023) | (0.037) | (0.025) | (0.019) |
| Climate message | 0.029 | 0.059 | -0.007 | 0.009 |
|  | (0.024) | (0.037) | (0.026) | (0.019) |
| Costly action message | 0.001 | 0.032 | -0.003 | -0.018 |
|  | (0.022) | (0.037) | (0.024) | (0.018) |
| Combination message | 0.009 | 0.022 | 0.010 | -0.001 |
|  | (0.023) | (0.036) | (0.024) | (0.018) |
| *Difference in treatment effects* |  |  |  |  |
| Republican |  |  |  |  |
| Combination - climate | -0.021 | -0.037 | 0.017 | -0.011 |
|  | (0.025) | (0.038) | (0.026) | (0.021) |
| Democrat |  |  |  |  |
| Combination - climate | 0.000 | -0.064 | 0.012 | 0.020 |
|  | (0.023) | (0.037) | (0.021) | (0.021) |
| $R^2$ | 0.81 | 0.64 | 0.67 | 0.73 |
| N | 7512 | 7526 | 7574 | 7556 |

* $p < 0.05$, ** $p < 0.01$, *** $p < .005$ (two-sided). OLS models with robust standard errors. The sample here consists of Republicans and Democrats. The composite scale is based on factor scores from the individual measures. Measure 1 refers to the respondent's beliefs regarding the extent to which environmental scientists agree among themselves about the existence and causes of global warming. Measure 2 refers to the respondent's beliefs regarding whether or not the world's temperatures are increasing. Measure 3 refers to the respondent's beliefs regarding whether the rise in the world's temperatures is being caused mostly by human activity or mostly by natural causes.

# Study 2: Electric Vehicles

Table B8: Study 2 treatment effects on likelihood of driving an electric vehicle (no partisan interactions)

|  | Composite scale | Measure 1 | Measure 2 | Measure 3 | Measure 4 |
|---|---|---|---|---|---|
| Baseline message | 0.049*** | 0.068*** | 0.064** | 0.059** | -0.005 |
|  | (0.016) | (0.021) | (0.023) | (0.023) | (0.014) |
| Climate message | 0.046** | 0.050* | 0.066*** | 0.094*** | -0.017 |
|  | (0.017) | (0.022) | (0.022) | (0.023) | (0.014) |
| Costly action message | 0.069*** | 0.076*** | 0.069*** | 0.110*** | 0.008 |
|  | (0.017) | (0.022) | (0.023) | (0.023) | (0.015) |
| Combination message | 0.073*** | 0.083*** | 0.070*** | 0.108*** | -0.003 |
|  | (0.016) | (0.022) | (0.022) | (0.023) | (0.015) |
| Republican | -0.021 | -0.023 | -0.025 | -0.042 | -0.024 |
|  | (0.015) | (0.024) | (0.021) | (0.024) | (0.014) |
| Controls | ✓ | ✓ | ✓ | ✓ | ✓ |
| Constant | -0.632*** | -0.190* | -0.158** | -0.197** | -0.310*** |
|  | (0.078) | (0.074) | (0.059) | (0.073) | (0.043) |
| *Difference in treatment effects* |  |  |  |  |  |
| Costly action - baseline | 0.020 | 0.008 | 0.004 | 0.051* | 0.013 |
|  | (0.018) | (0.023) | (0.025) | (0.025) | (0.014) |
| $R^2$ | 0.80 | 0.72 | 0.74 | 0.79 | 0.10 |
| N | 6661 | 6660 | 6660 | 6653 | 6656 |

* $p < 0.05$, ** $p < 0.01$, *** $p < .005$ (two-sided). OLS models with robust standard errors. The sample here consists of Republicans and Democrats who do not currently own or lease an electric vehicle. The composite scale is based on factor scores from the individual measures. Measure 1 refers to the respondent's likelihood of buying or leasing an electric vehicle in the next year. Measure 2 refers to the respondent's likelihood of visiting a dealership or searching online to look for electric vehicles in the next year. Measure 3 refers to the respondent's likelihood of seriously considering purchasing an electric vehicle the next time they purchase a vehicle. Measure 4 refers to whether the respondent indicated that they would like to receive more information at the end of the survey about how to charge an electric vehicle at home.

Table B9: Study 2 treatment effects on likelihood of driving an electric vehicle (partisan interactions)

|  | Composite scale | Measure 1 | Measure 2 | Measure 3 | Measure 4 |
|---|---|---|---|---|---|
| Baseline message | 0.066** | 0.097*** | 0.101*** | 0.065 | -0.007 |
|  | (0.024) | (0.031) | (0.033) | (0.034) | (0.021) |
| Climate message | 0.077*** | 0.081* | 0.108*** | 0.134*** | -0.014 |
|  | (0.025) | (0.034) | (0.034) | (0.034) | (0.022) |
| Costly action message | 0.130*** | 0.155*** | 0.136*** | 0.168*** | 0.018 |
|  | (0.025) | (0.033) | (0.034) | (0.035) | (0.022) |
| Combination message | 0.135*** | 0.171*** | 0.132*** | 0.163*** | 0.016 |
|  | (0.025) | (0.033) | (0.034) | (0.036) | (0.023) |
| Republican | 0.051* | 0.084*** | 0.065* | 0.026 | -0.012 |
|  | (0.022) | (0.030) | (0.032) | (0.034) | (0.023) |
| Republican × baseline message | -0.034 | -0.056 | -0.078 | -0.012 | 0.004 |
|  | (0.032) | (0.042) | (0.045) | (0.045) | (0.029) |
| Republican × climate message | -0.066* | -0.061 | -0.091* | -0.086 | -0.005 |
|  | (0.032) | (0.043) | (0.044) | (0.044) | (0.028) |
| Republican × costly action message | -0.130*** | -0.165*** | -0.143*** | -0.124** | -0.021 |
|  | (0.033) | (0.043) | (0.045) | (0.045) | (0.029) |
| Republican × combination message | -0.132*** | -0.183*** | -0.128*** | -0.118** | -0.040 |
|  | (0.032) | (0.043) | (0.044) | (0.045) | (0.029) |
| Controls | ✓ | ✓ | ✓ | ✓ | ✓ |
| Constant | -0.660*** | -0.236*** | -0.207*** | -0.224*** | -0.315*** |
|  | (0.078) | (0.060) | (0.068) | (0.074) | (0.045) |
| *Treatment effects for Republicans* |  |  |  |  |  |
| Baseline message | 0.031 | 0.041 | 0.023 | 0.053 | -0.003 |
|  | (0.021) | (0.029) | (0.031) | (0.029) | (0.019) |
| Climate message | 0.010 | 0.020 | 0.017 | 0.048 | -0.020 |
|  | (0.020) | (0.027) | (0.028) | (0.028) | (0.018) |
| Costly action message | 0.000 | -0.009 | -0.007 | 0.044 | -0.003 |
|  | (0.021) | (0.028) | (0.030) | (0.029) | (0.019) |
| Combination message | 0.003 | -0.011 | 0.004 | 0.045 | -0.024 |
|  | (0.020) | (0.027) | (0.028) | (0.028) | (0.018) |
| *Difference in treatment effects* |  |  |  |  |  |
| Republican |  |  |  |  |  |
| Climate - baseline | -0.021 | -0.021 | -0.006 | -0.005 | -0.017 |
|  | (0.023) | (0.030) | (0.033) | (0.031) | (0.018) |
| Costly action - baseline | -0.031 | -0.050 | -0.031 | -0.009 | 0.000 |
|  | (0.024) | (0.031) | (0.034) | (0.031) | (0.018) |
| Combination - costly action | 0.003 | -0.002 | 0.011 | 0.001 | -0.021 |
|  | (0.023) | (0.030) | (0.032) | (0.030) | (0.018) |
| Combination - climate | -0.007 | -0.031 | -0.013 | -0.003 | -0.004 |
|  | (0.022) | (0.029) | (0.030) | (0.029) | (0.017) |
| Democrat |  |  |  |  |  |
| Costly action - baseline | 0.065* | 0.058 | 0.035 | 0.103** | 0.025 |
|  | (0.027) | (0.035) | (0.037) | (0.038) | (0.022) |
| Combination - costly action | 0.005 | 0.016 | -0.004 | -0.005 | -0.002 |
|  | (0.028) | (0.036) | (0.038) | (0.040) | (0.023) |
| Combination - climate | 0.059* | 0.090* | 0.024 | 0.029 | 0.030 |
|  | (0.028) | (0.037) | (0.038) | (0.039) | (0.022) |
| $R^2$ | 0.80 | 0.72 | 0.74 | 0.79 | 0.10 |
| N | 6661 | 6674 | 6654 | 6653 | 6656 |

* $p < 0.05$, ** $p < 0.01$, *** $p < .005$ (two-sided). OLS models with robust standard errors. The sample here consists of Republicans and Democrats who do not currently own or lease an electric vehicle. The composite scale is based on factor scores from the individual measures. Measure 1 refers to the respondent's likelihood of buying or leasing an electric vehicle in the next year. Measure 2 refers to the respondent's likelihood of visiting a dealership or searching online to look for electric vehicles in the next year. Measure 3 refers to the respondent's likelihood of seriously considering purchasing an electric vehicle the next time they purchase a vehicle. Measure 4 refers to whether the respondent indicated that they would like to receive more information at the end of the survey about how to charge an electric vehicle at home.

Table B10: Study 2 treatment effects on support for low-carbon transportation (no partisan interactions)

| | Composite scale | Measure 1 | Measure 2 | Measure 3 |
|---|---|---|---|---|
| Baseline message | 0.026 | 0.066* | 0.002 | 0.006 |
| | (0.016) | (0.026) | (0.009) | (0.010) |
| Climate message | 0.020 | -0.003 | 0.011 | 0.010 |
| | (0.016) | (0.027) | (0.009) | (0.010) |
| Costly action message | 0.033* | 0.043 | 0.014 | 0.007 |
| | (0.016) | (0.027) | (0.010) | (0.011) |
| Combination message | 0.039* | 0.055* | 0.009 | 0.016 |
| | (0.017) | (0.027) | (0.010) | (0.011) |
| Republican | -0.047*** | -0.013 | -0.014 | -0.050*** |
| | (0.017) | (0.024) | (0.010) | (0.011) |
| Controls | ✓ | ✓ | ✓ | ✓ |
| Constant | -0.595*** | 0.084 | -0.075** | -0.110*** |
| | (0.062) | (0.071) | (0.027) | (0.033) |
| *Difference in treatment effects* | | | | |
| Combination - climate | 0.008 | -0.023 | 0.012 | 0.001 |
| | (0.016) | (0.026) | (0.010) | (0.010) |
| $R^2$ | 0.79 | 0.71 | 0.65 | 0.64 |
| N | 8218 | 8268 | 8233 | 8225 |

* $p < 0.05$, ** $p < 0.01$, *** $p < .005$ (two-sided). OLS models with robust standard errors. The sample here consists of Republicans and Democrats. The composite scale is based on factor scores from the individual measures. Measure 1 refers to the respondent's likelihood of driving less and using other forms of transportation more in the next year. Measure 2 refers to whether the respondent favors or opposes providing incentives to increase the use of hybrid and electric vehicles. Measure 3 refers to whether the respondent favors or opposes phasing out the production of new gasoline cars and trucks by 2035.

Table B11: Study 2 treatment effects on support for low-carbon transportation (partisan interactions)

|  | Composite scale | Measure 1 | Measure 2 | Measure 3 |
|---|---|---|---|---|
| Baseline message | 0.025 | 0.108*** | -0.000 | -0.000 |
|  | (0.021) | (0.035) | (0.012) | (0.014) |
| Climate message | 0.025 | 0.019 | 0.019 | 0.001 |
|  | (0.022) | (0.036) | (0.013) | (0.014) |
| Costly action message | 0.032 | 0.081* | 0.004 | 0.007 |
|  | (0.022) | (0.036) | (0.013) | (0.015) |
| Combination message | 0.037 | 0.095** | -0.000 | 0.017 |
|  | (0.023) | (0.037) | (0.013) | (0.015) |
| Republican | -0.047 | 0.054 | -0.020 | -0.057*** |
|  | (0.026) | (0.043) | (0.015) | (0.017) |
| Republican × baseline message | 0.002 | -0.101 | 0.004 | 0.014 |
|  | (0.031) | (0.053) | (0.018) | (0.020) |
| Republican × climate message | -0.011 | -0.051 | -0.019 | 0.022 |
|  | (0.031) | (0.054) | (0.019) | (0.020) |
| Republican × costly action message | 0.004 | -0.085 | 0.022 | 0.000 |
|  | (0.032) | (0.054) | (0.019) | (0.021) |
| Republican × combination message | 0.005 | -0.095 | 0.022 | -0.002 |
|  | (0.033) | (0.055) | (0.019) | (0.021) |
| Controls | ✓ | ✓ | ✓ | ✓ |
| Constant | -0.594*** | 0.059 | -0.072* | -0.107*** |
|  | (0.062) | (0.073) | (0.028) | (0.033) |
| *Treatment effects for Republicans* |  |  |  |  |
| Baseline message | 0.027 | 0.007 | 0.004 | 0.014 |
|  | (0.023) | (0.041) | (0.013) | (0.015) |
| Climate message | 0.013 | -0.032 | -0.000 | 0.023 |
|  | (0.023) | (0.040) | (0.014) | (0.014) |
| Costly action message | 0.035 | -0.004 | 0.026 | 0.007 |
|  | (0.023) | (0.041) | (0.015) | (0.015) |
| Combination message | 0.042 | 0.000 | 0.021 | 0.015 |
|  | (0.024) | (0.041) | (0.014) | (0.015) |
| *Difference in treatment effects* |  |  |  |  |
| Republican |  |  |  |  |
| Climate - baseline | -0.013 | -0.039 | -0.005 | 0.009 |
|  | (0.023) | (0.038) | (0.015) | (0.014) |
| Costly action - baseline | 0.009 | -0.012 | 0.022 | -0.007 |
|  | (0.024) | (0.038) | (0.015) | (0.015) |
| Combination - costly action | 0.006 | 0.005 | -0.005 | 0.008 |
|  | (0.024) | (0.039) | (0.015) | (0.015) |
| Combination - climate | 0.028 | 0.032 | 0.022 | -0.007 |
|  | (0.023) | (0.038) | (0.015) | (0.014) |
| Democrat |  |  |  |  |
| Costly action - baseline | 0.007 | -0.027 | 0.004 | 0.007 |
|  | (0.022) | (0.036) | (0.012) | (0.015) |
| Combination - costly action | 0.005 | 0.014 | -0.004 | 0.011 |
|  | (0.024) | (0.038) | (0.013) | (0.015) |
| Combination - climate | 0.012 | 0.076* | -0.019 | 0.017 |
|  | (0.023) | (0.038) | (0.013) | (0.015) |
| $R^2$ | 0.79 | 0.71 | 0.65 | 0.64 |
| N | 8218 | 8264 | 8233 | 8225 |

* $p < 0.05$, ** $p < 0.01$, *** $p < .005$ (two-sided). OLS models with robust standard errors. The sample here consists of Republicans and Democrats. The composite scale is based on factor scores from the individual measures. Measure 1 refers to the respondent's likelihood of driving less and using other forms of transportation more in the next year. Measure 2 refers to whether the respondent favors or opposes providing incentives to increase the use of hybrid and electric vehicles. Measure 3 refers to whether the respondent favors or opposes phasing out the production of new gasoline cars and trucks by 2035.

Table B12: Study 2 treatment effects on belief in anthropogenic climate change (no partisan interactions)

|  | Composite scale | Measure 1 | Measure 2 | Measure 3 |
|---|---|---|---|---|
| Baseline message | -0.016 | -0.027 | -0.002 | -0.007 |
|  | (0.016) | (0.024) | (0.017) | (0.015) |
| Climate message | 0.004 | 0.008 | 0.009 | -0.001 |
|  | (0.017) | (0.025) | (0.017) | (0.016) |
| Costly action message | -0.018 | -0.040 | 0.021 | -0.022 |
|  | (0.016) | (0.025) | (0.017) | (0.015) |
| Combination message | 0.001 | -0.007 | 0.009 | -0.001 |
|  | (0.016) | (0.024) | (0.018) | (0.015) |
| Republican | -0.029 | -0.041 | -0.016 | -0.030 |
|  | (0.017) | (0.025) | (0.017) | (0.016) |
| Controls | ✓ | ✓ | ✓ | ✓ |
| Constant | -0.722*** | 0.422*** | 0.675*** | 0.221*** |
|  | (0.087) | (0.080) | (0.059) | (0.051) |
| *Difference in treatment effects* |  |  |  |  |
| Combination - climate | -0.003 | -0.014 | 0.000 | -0.000 |
|  | (0.017) | (0.026) | (0.018) | (0.015) |
| $R^2$ | 0.78 | 0.62 | 0.61 | 0.68 |
| N | 8190 | 8200 | 8205 | 8194 |

* $p < 0.05$, ** $p < 0.01$, *** $p < .005$ (two-sided). OLS models with robust standard errors. The sample here consists of Republicans and Democrats. The composite scale is based on factor scores from the individual measures. Measure 1 refers to the respondent's beliefs regarding the extent to which environmental scientists agree among themselves about the existence and causes of global warming. Measure 2 refers to the respondent's beliefs regarding whether or not the world's temperatures are increasing. Measure 3 refers to the respondent's beliefs regarding whether the rise in the world's temperatures is being caused mostly by human activity or mostly by natural causes.

Table B13: Study 2 treatment effects on belief in anthropogenic climate change (partisan interactions)

| | Composite scale | Measure 1 | Measure 2 | Measure 3 |
|---|---|---|---|---|
| Baseline message | -0.016 | -0.011 | -0.011 | -0.011 |
| | (0.021) | (0.032) | (0.022) | (0.020) |
| Climate message | 0.015 | 0.054 | -0.007 | 0.002 |
| | (0.022) | (0.034) | (0.021) | (0.022) |
| Costly action message | -0.000 | -0.013 | 0.018 | -0.005 |
| | (0.021) | (0.032) | (0.021) | (0.021) |
| Combination message | 0.013 | 0.011 | 0.019 | -0.005 |
| | (0.022) | (0.033) | (0.023) | (0.021) |
| Republican | -0.010 | 0.011 | -0.026 | -0.024 |
| | (0.026) | (0.038) | (0.028) | (0.025) |
| Republican × baseline message | 0.001 | -0.038 | 0.022 | 0.008 |
| | (0.033) | (0.049) | (0.036) | (0.031) |
| Republican × climate message | -0.026 | -0.110* | 0.038 | -0.008 |
| | (0.033) | (0.050) | (0.035) | (0.031) |
| Republican × costly action message | -0.040 | -0.065 | 0.009 | -0.037 |
| | (0.033) | (0.050) | (0.035) | (0.030) |
| Republican × combination message | -0.028 | -0.043 | -0.021 | 0.008 |
| | (0.032) | (0.049) | (0.036) | (0.029) |
| Controls | ✓ | ✓ | ✓ | ✓ |
| Constant | -0.730*** | 0.402*** | 0.674*** | 0.216*** |
| | (0.088) | (0.081) | (0.062) | (0.053) |
| *Treatment effects for Republicans* | | | | |
| Baseline message | -0.015 | -0.049 | 0.011 | -0.002 |
| | (0.025) | (0.036) | (0.028) | (0.023) |
| Climate message | -0.011 | -0.057 | 0.031 | -0.005 |
| | (0.025) | (0.037) | (0.028) | (0.023) |
| Costly action message | -0.040 | -0.078* | 0.026 | -0.042 |
| | (0.025) | (0.038) | (0.028) | (0.022) |
| Combination message | -0.015 | -0.032 | -0.003 | 0.004 |
| | (0.023) | (0.036) | (0.028) | (0.020) |
| *Difference in treatment effects* | | | | |
| Republican | | | | |
| Combination - climate | -0.004 | 0.025 | -0.034 | 0.009 |
| | (0.025) | (0.037) | (0.028) | (0.020) |
| Democrat | | | | |
| Combination - climate | -0.002 | -0.043 | 0.026 | -0.007 |
| | (0.023) | (0.036) | (0.023) | (0.022) |
| R² | 0.78 | 0.62 | 0.61 | 0.68 |
| N | 8190 | 8200 | 8202 | 8193 |

* $p < 0.05$, ** $p < 0.01$, *** $p < .005$ (two-sided). OLS models with robust standard errors. The sample here consists of Republicans and Democrats. The composite scale is based on factor scores from the individual measures. Measure 1 refers to the respondent's beliefs regarding the extent to which environmental scientists agree among themselves about the existence and causes of global warming. Measure 2 refers to the respondent's beliefs regarding whether or not the world's temperatures are increasing. Measure 3 refers to the respondent's beliefs regarding whether the rise in the world's temperatures is being caused mostly by human activity or mostly by natural causes.

# 9 Online Appendix C: Study 2 Exploratory Analysis

In this appendix, I report exploratory analyses for Study 2 that omit Republican respondents who recognized a Democratic governor in their treatment article. (The tables in this appendix do not include linear combinations for Democrats, as those results remain the same. However, the figures include the outputs of Democrat-only analyses, for ease of comparison.)

Table C1: Exploratory Study 2 treatment effects on likelihood of driving an electric vehicle (no partisan interactions)

|  | Composite scale | Measure 1 | Measure 2 | Measure 3 | Measure 4 |
|---|---|---|---|---|---|
| Baseline message | 0.051*** | 0.072*** | 0.066** | 0.056* | -0.002 |
|  | (0.017) | (0.022) | (0.024) | (0.024) | (0.015) |
| Climate message | 0.054*** | 0.056* | 0.078*** | 0.104*** | -0.012 |
|  | (0.018) | (0.024) | (0.024) | (0.024) | (0.015) |
| Costly action message | 0.084*** | 0.091*** | 0.085*** | 0.122*** | 0.016 |
|  | (0.018) | (0.024) | (0.024) | (0.024) | (0.016) |
| Combination message | 0.084*** | 0.092*** | 0.078*** | 0.116*** | 0.006 |
|  | (0.017) | (0.023) | (0.024) | (0.025) | (0.016) |
| Republican | -0.013 | -0.017 | -0.015 | -0.037 | -0.018 |
|  | (0.015) | (0.025) | (0.022) | (0.025) | (0.014) |
| Controls | ✓ | ✓ | ✓ | ✓ | ✓ |
| Constant | -0.649*** | -0.210** | -0.171** | -0.202** | -0.311*** |
|  | (0.081) | (0.080) | (0.063) | (0.078) | (0.046) |
| *Difference in treatment effects* |  |  |  |  |  |
| Costly action - baseline | 0.033 | 0.019 | 0.019 | 0.065* | 0.018 |
|  | (0.020) | (0.026) | (0.028) | (0.027) | (0.016) |
| $R^2$ | 0.79 | 0.71 | 0.74 | 0.78 | 0.09 |
| N | 6071 | 6063 | 6061 | 6065 | 6058 |

* $p < 0.05$, ** $p < 0.01$, *** $p < .005$ (two-sided). OLS models with robust standard errors. The sample here consists of Republicans and Democrats who do not currently own or lease an electric vehicle. The composite scale is based on factor scores from the individual measures. Measure 1 refers to the respondent's likelihood of buying or leasing an electric vehicle in the next year. Measure 2 refers to the respondent's likelihood of visiting a dealership or searching online to look for electric vehicles in the next year. Measure 3 refers to the respondent's likelihood of seriously considering purchasing an electric vehicle the next time they purchase a vehicle. Measure 4 refers to whether the respondent indicated that they would like to receive more information at the end of the survey about how to charge an electric vehicle at home. Republican respondents who recognized a Democratic governor in their treatment article are omitted.

Table C2: Exploratory Study 2 treatment effects on likelihood of driving an electric vehicle (partisan interactions)
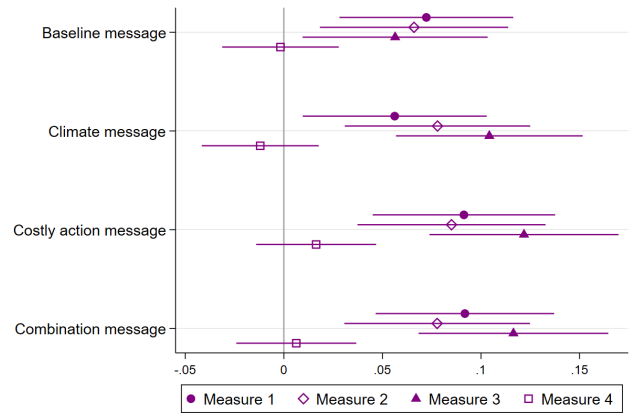
| | Composite scale | Measure 1 | Measure 2 | Measure 3 | Measure 4 |
|---|---|---|---|---|---|
| Baseline message | 0.065** | 0.093*** | 0.101*** | 0.064 | -0.006 |
| | (0.024) | (0.031) | (0.033) | (0.034) | (0.021) |
| Climate message | 0.076*** | 0.078* | 0.108*** | 0.133*** | -0.014 |
| | (0.025) | (0.034) | (0.034) | (0.034) | (0.022) |
| Costly action message | 0.129*** | 0.152*** | 0.135*** | 0.167*** | 0.018 |
| | (0.025) | (0.033) | (0.034) | (0.035) | (0.022) |
| Combination message | 0.135*** | 0.166*** | 0.132*** | 0.163*** | 0.017 |
| | (0.025) | (0.033) | (0.034) | (0.036) | (0.023) |
| Republican | 0.046* | 0.059 | 0.059 | 0.017 | -0.016 |
| | (0.023) | (0.033) | (0.032) | (0.035) | (0.024) |
| Republican × baseline message | -0.028 | -0.039 | -0.076 | -0.010 | 0.012 |
| | (0.033) | (0.045) | (0.048) | (0.047) | (0.030) |
| Republican × climate message | -0.047 | -0.042 | -0.065 | -0.063 | 0.005 |
| | (0.035) | (0.046) | (0.047) | (0.047) | (0.030) |
| Republican × costly action message | -0.106*** | -0.138*** | -0.113* | -0.105* | -0.004 |
| | (0.035) | (0.046) | (0.048) | (0.048) | (0.030) |
| Republican × combination message | -0.120*** | -0.171*** | -0.123** | -0.110* | -0.026 |
| | (0.034) | (0.045) | (0.047) | (0.047) | (0.030) |
| Controls | ✓ | ✓ | ✓ | ✓ | ✓ |
| Constant | -0.670*** | -0.245*** | -0.207*** | -0.221** | -0.312*** |
| | (0.081) | (0.081) | (0.064) | (0.080) | (0.047) |
| *Treatment effects for Republicans* | | | | | |
| Baseline message | 0.037 | 0.054 | 0.025 | 0.054 | 0.006 |
| | (0.024) | (0.033) | (0.035) | (0.033) | (0.021) |
| Climate message | 0.029 | 0.036 | 0.044 | 0.071* | -0.008 |
| | (0.024) | (0.031) | (0.033) | (0.032) | (0.020) |
| Costly action message | 0.024 | 0.014 | 0.022 | 0.062 | 0.014 |
| | (0.025) | (0.033) | (0.035) | (0.033) | (0.021) |
| Combination message | 0.015 | -0.005 | 0.009 | 0.053 | -0.009 |
| | (0.024) | (0.032) | (0.033) | (0.031) | (0.020) |
| *Difference in treatment effects Republican* | | | | | |
| Climate - baseline | -0.008 | -0.018 | 0.019 | 0.017 | -0.015 |
| | (0.027) | (0.037) | (0.041) | (0.037) | (0.022) |
| Costly action - baseline | -0.013 | -0.040 | -0.003 | 0.008 | 0.008 |
| | (0.028) | (0.038) | (0.042) | (0.038) | (0.022) |
| Combination - costly action | -0.009 | -0.019 | -0.014 | -0.009 | -0.023 |
| | (0.029) | (0.038) | (0.040) | (0.037) | (0.022) |
| Combination - climate | -0.014 | -0.041 | -0.035 | -0.018 | -0.001 |
| | (0.028) | (0.036) | (0.039) | (0.035) | (0.021) |
| $R^2$ | 0.79 | 0.71 | 0.74 | 0.78 | 0.09 |
| N | 6061 | 6063 | 6061 | 6055 | 6058 |

* $p < 0.05$, ** $p < 0.01$, *** $p < .005$ (two-sided). OLS models with robust standard errors. The sample here consists of Republicans and Democrats who do not currently own or lease an electric vehicle. The composite scale is based on factor scores from the individual measures. Measure 1 refers to the respondent's likelihood of buying or leasing an electric vehicle in the next year. Measure 2 refers to the respondent's likelihood of visiting a dealership or searching online to look for electric vehicles in the next year. Measure 3 refers to the respondent's likelihood of seriously considering purchasing an electric vehicle the next time they purchase a vehicle. Measure 4 refers to whether the respondent indicated that they would like to receive more information at the end of the survey about how to charge an electric vehicle at home. Republican respondents who recognized a Democratic governor in their treatment article are omitted.
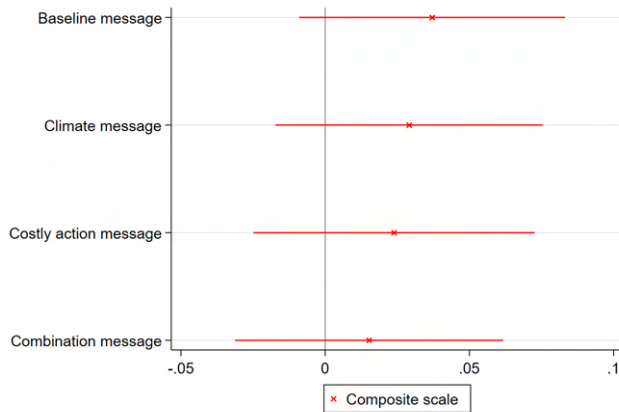
# Figure C1: Exploratory Study 2 treatment effects on likelihood of driving an electric vehicle
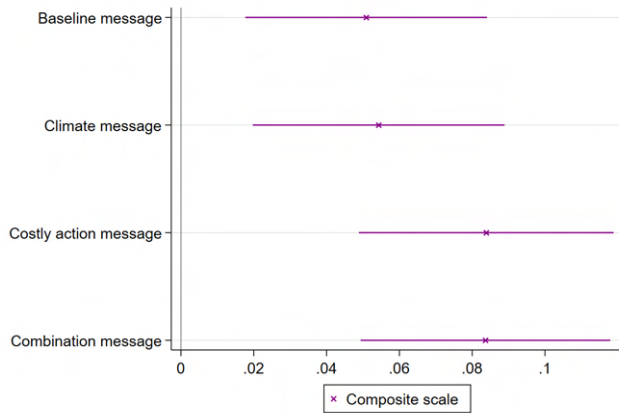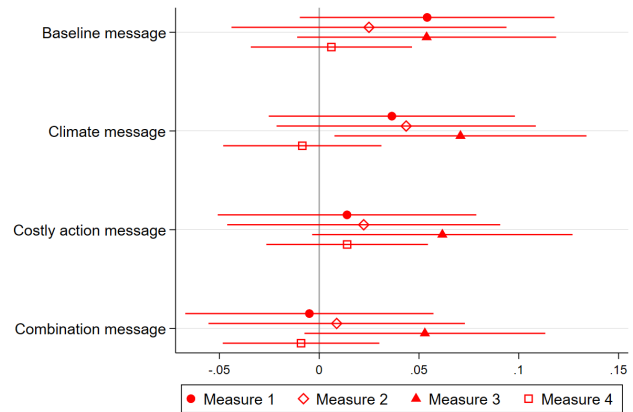


(a) Composite scale (pooled)

(d) Individual measures (pooled)

(b) Composite scale (Republicans)

(e) Individual measures (Republicans)

(c) Composite scale (Democrats)

(f) Individual measures (Democrats)

Estimates for which the confidence intervals do not intersect the vertical line at 0 represent statistically significant treatment effects at the 0.05 level relative to the pure control condition. The composite scale is based on factor scores from the individual measures. Republican respondents who recognized a Democratic governor in their treatment article are omitted.

Table C3: Exploratory Study 2 treatment effects on support for low-carbon transportation (no partisan interactions)

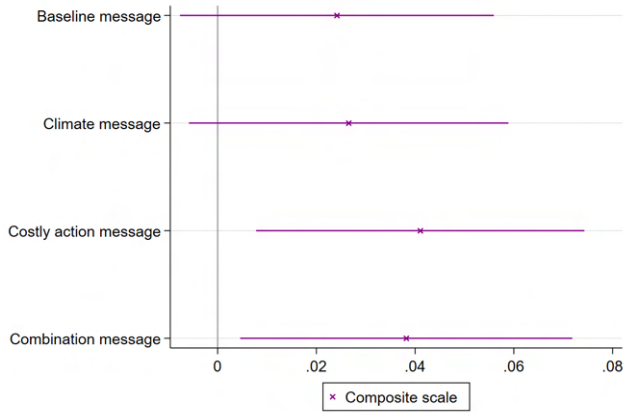|  | Composite scale | Measure 1 | Measure 2 | Measure 3 |
|---|---|---|---|---|
| Baseline message | 0.024 | 0.068* | 0.003 | 0.003 |
|  | (0.016) | (0.027) | (0.009) | (0.011) |
| Climate message | 0.027 | 0.009 | 0.016 | 0.010 |
|  | (0.017) | (0.028) | (0.010) | (0.011) |
| Costly action message | 0.041* | 0.054 | 0.018 | 0.009 |
|  | (0.017) | (0.028) | (0.010) | (0.011) |
| Combination message | 0.038* | 0.050 | 0.009 | 0.019 |
|  | (0.017) | (0.028) | (0.010) | (0.011) |
| Republican | -0.045** | -0.025 | -0.013 | -0.048*** |
|  | (0.017) | (0.021) | (0.010) | (0.011) |
| Controls | ✓ | ✓ | ✓ | ✓ |
| Constant | -0.592*** | 0.079 | -0.071* | -0.118*** |
|  | (0.065) | (0.071) | (0.029) | (0.035) |
| *Difference in treatment effects* |  |  |  |  |
| Combination - climate | 0.017 | -0.015 | 0.014 | 0.006 |
|  | (0.017) | (0.028) | (0.010) | (0.011) |
| $R^2$ | 0.77 | 0.70 | 0.62 | 0.62 |
| N | 7569 | 7614 | 7586 | 7580 |

* $p < 0.05$, ** $p < 0.01$, *** $p < .005$ (two-sided). OLS models with robust standard errors. The sample here consists of Republicans and Democrats. The composite scale is based on factor scores from the individual measures. Measure 1 refers to the respondent's likelihood of driving less and using other forms of transportation more in the next year. Measure 2 refers to whether the respondent favors or opposes providing incentives to increase the use of hybrid and electric vehicles. Measure 3 refers to whether the respondent favors or opposes phasing out the production of new gasoline cars and trucks by 2035. Republican respondents who recognized a Democratic governor in their treatment article are omitted.

Table C4: Exploratory Study 2 treatment effects on support for low-carbon transportation (partisan interactions)
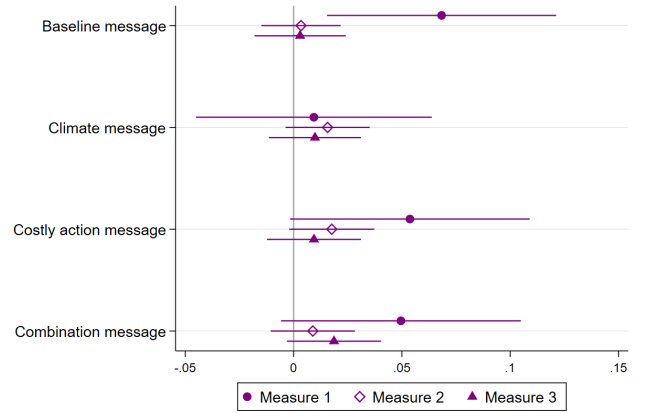
| | Composite scale | Measure 1 | Measure 2 | Measure 3 |
|---|---|---|---|---|
| Baseline message | 0.025 | 0.109*** | 0.000 | -0.000 |
| | (0.021) | (0.035) | (0.012) | (0.014) |
| Climate message | 0.025 | 0.018 | 0.019 | 0.001 |
| | (0.022) | (0.036) | (0.013) | (0.014) |
| Costly action message | 0.032 | 0.081* | 0.004 | 0.007 |
| | (0.022) | (0.036) | (0.013) | (0.015) |
| Combination message | 0.037 | 0.095** | -0.000 | 0.018 |
| | (0.023) | (0.037) | (0.013) | (0.015) |
| Republican | -0.051 | 0.034 | -0.024 | -0.056*** |
| | (0.026) | (0.041) | (0.015) | (0.018) |
| Republican × baseline message | -0.003 | -0.104 | 0.007 | 0.007 |
| | (0.033) | (0.055) | (0.019) | (0.022) |
| Republican × climate message | 0.004 | -0.014 | -0.011 | 0.024 |
| | (0.033) | (0.056) | (0.021) | (0.022) |
| Republican × costly action message | 0.023 | -0.066 | 0.034 | 0.006 |
| | (0.034) | (0.058) | (0.021) | (0.022) |
| Republican × combination message | 0.003 | -0.114* | 0.023 | 0.002 |
| | (0.034) | (0.057) | (0.020) | (0.022) |
| Controls | ✓ | ✓ | ✓ | ✓ |
| Constant | -0.590*** | 0.051 | -0.066* | -0.115*** |
| | (0.065) | (0.073) | (0.030) | (0.036) |
| *Treatment effects for Republicans* | | | | |
| Baseline message | 0.022 | 0.005 | 0.008 | 0.007 |
| | (0.026) | (0.043) | (0.015) | (0.017) |
| Climate message | 0.029 | 0.004 | 0.008 | 0.025 |
| | (0.025) | (0.043) | (0.016) | (0.016) |
| Costly action message | 0.055* | 0.015 | 0.038* | 0.013 |
| | (0.026) | (0.045) | (0.016) | (0.016) |
| Combination message | 0.040 | -0.019 | 0.023 | 0.020 |
| | (0.026) | (0.044) | (0.015) | (0.016) |
| *Difference in treatment effects* Republican | | | | |
| Climate - baseline | 0.007 | -0.000 | 0.000 | 0.018 |
| | (0.028) | (0.043) | (0.018) | (0.018) |
| Costly action - baseline | 0.033 | 0.010 | 0.030 | 0.006 |
| | (0.028) | (0.045) | (0.018) | (0.018) |
| Combination - costly action | -0.016 | -0.034 | -0.015 | 0.006 |
| | (0.029) | (0.046) | (0.018) | (0.018) |
| Combination - climate | 0.011 | -0.024 | 0.015 | -0.005 |
| | (0.028) | (0.044) | (0.018) | (0.018) |
| $R^2$ | 0.77 | 0.70 | 0.62 | 0.62 |
| N | 7569 | 7614 | 7586 | 7580 |

* $p < 0.05$, ** $p < 0.01$, *** $p < .005$ (two-sided). OLS models with robust standard errors. The sample here consists of Republicans and Democrats. The composite scale is based on factor scores from the individual measures. Measure 1 refers to the respondent's likelihood of driving less and using other forms of transportation more in the next year. Measure 2 refers to whether the respondent favors or opposes providing incentives to increase the use of hybrid and electric vehicles. Measure 3 refers to whether the respondent favors or opposes phasing out the production of new gasoline cars and trucks by 2035. Republican respondents who recognized a Democratic governor in their treatment article are omitted.
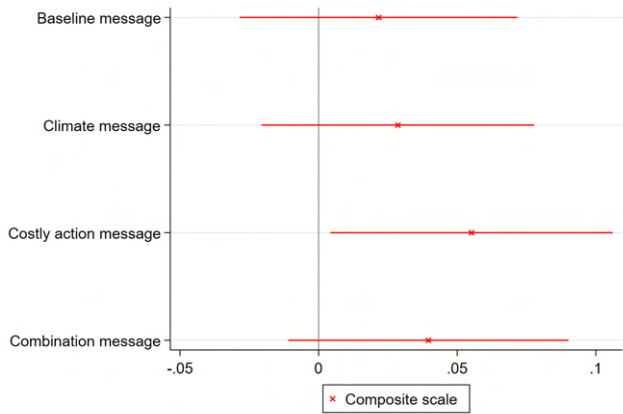
Figure C2: Exploratory Study 2 treatment effects on support for low-carbon transportation
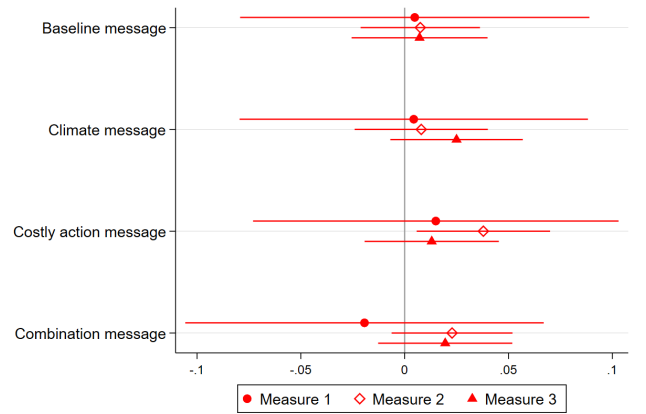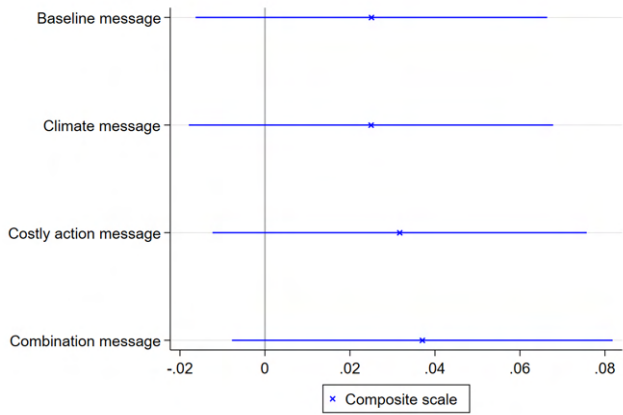


(a) Composite scale (pooled)
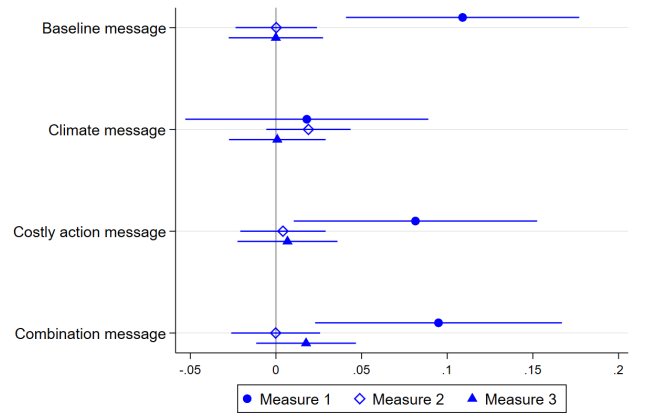


(d) Individual measures (pooled)



(b) Composite scale (Republicans)



(e) Individual measures (Republicans)



(c) Composite scale (Democrats)



(f) Individual measures (Democrats)

Estimates for which the confidence intervals do not intersect the vertical line at 0 represent statistically significant treatment effects at the 0.05 level relative to the pure control condition. The composite scale is based on factor scores from the individual measures. Republican respondents who recognized a Democratic governor in their treatment article are omitted.

Table C5: Exploratory Study 2 treatment effects on belief in anthropogenic climate change (no partisan interactions)

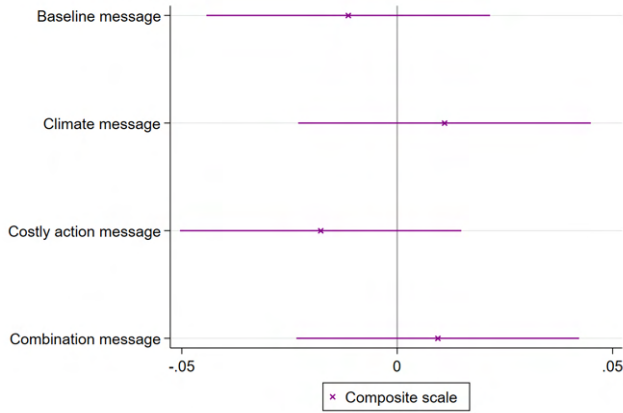|  | Composite scale | Measure 1 | Measure 2 | Measure 3 |
|---|---|---|---|---|
| Baseline message | -0.011 | -0.015 | 0.003 | -0.008 |
|  | (0.017) | (0.025) | (0.018) | (0.016) |
| Climate message | 0.011 | 0.015 | 0.015 | 0.003 |
|  | (0.017) | (0.026) | (0.018) | (0.016) |
| Costly action message | -0.018 | -0.031 | 0.017 | -0.022 |
|  | (0.017) | (0.026) | (0.017) | (0.016) |
| Combination message | 0.009 | -0.002 | 0.016 | 0.006 |
|  | (0.017) | (0.025) | (0.019) | (0.015) |
| Republican | -0.032 | -0.035 | -0.020 | -0.031 |
|  | (0.018) | (0.025) | (0.018) | (0.016) |
| Controls | ✓ | ✓ | ✓ | ✓ |
| Constant | -0.760*** | 0.420*** | 0.728*** | 0.245*** |
|  | (0.096) | (0.086) | (0.066) | (0.054) |
| *Difference in treatment effects* |  |  |  |  |
| Combination - climate | -0.002 | -0.016 | 0.001 | 0.003 |
|  | (0.018) | (0.028) | (0.019) | (0.017) |
| $R^2$ | 0.75 | 0.60 | 0.57 | 0.66 |
| N | 7531 | 7554 | 7556 | 7548 |

* $p < 0.05$, ** $p < 0.01$, *** $p < .005$ (two-sided). OLS models with robust standard errors. The sample here consists of Republicans and Democrats. The composite scale is based on factor scores from the individual measures. Measure 1 refers to the respondent's beliefs regarding the extent to which environmental scientists agree among themselves about the existence and causes of global warming. Measure 2 refers to the respondent's beliefs regarding whether or not the world's temperatures are increasing. Measure 3 refers to the respondent's beliefs regarding whether the rise in the world's temperatures is being caused mostly by human activity or mostly by natural causes. Republican respondents who recognized a Democratic governor in their treatment article are omitted.

Table C6: Exploratory Study 2 treatment effects on belief in anthropogenic climate change (partisan interactions)
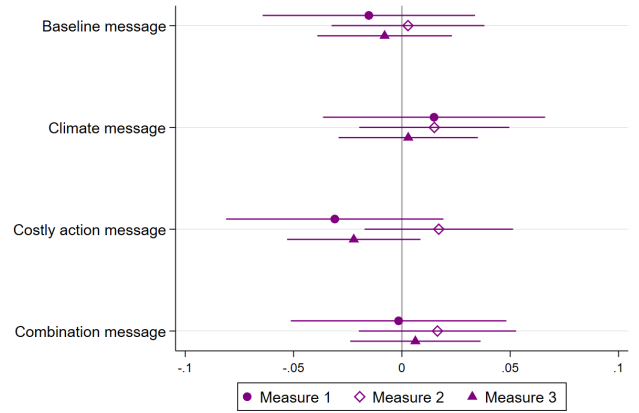
| | Composite scale | Measure 1 | Measure 2 | Measure 3 |
|---|---|---|---|---|
| Baseline message | -0.018 | -0.010 | -0.013 | -0.011 |
| | (0.021) | (0.032) | (0.022) | (0.020) |
| Climate message | 0.016 | 0.053 | -0.006 | 0.003 |
| | (0.022) | (0.034) | (0.021) | (0.021) |
| Costly action message | 0.001 | -0.013 | 0.017 | -0.006 |
| | (0.021) | (0.032) | (0.021) | (0.021) |
| Combination message | 0.013 | 0.010 | 0.018 | -0.005 |
| | (0.022) | (0.033) | (0.023) | (0.021) |
| Republican | -0.022 | 0.001 | -0.038 | -0.030 |
| | (0.027) | (0.039) | (0.029) | (0.026) |
| Republican × baseline message | 0.020 | -0.007 | 0.041 | 0.009 |
| | (0.035) | (0.051) | (0.038) | (0.033) |
| Republican × climate message | -0.012 | -0.102 | 0.056 | 0.001 |
| | (0.036) | (0.053) | (0.038) | (0.033) |
| Republican × costly action message | -0.046 | -0.043 | -0.002 | -0.042 |
| | (0.034) | (0.053) | (0.037) | (0.032) |
| Republican × combination message | -0.009 | -0.028 | -0.007 | 0.029 |
| | (0.033) | (0.051) | (0.038) | (0.030) |
| Controls | ✓ | ✓ | ✓ | ✓ |
| Constant | -0.765*** | 0.405*** | 0.737*** | 0.246*** |
| | (0.096) | (0.088) | (0.066) | (0.056) |
| *Treatment effects for Republicans* | | | | |
| Baseline message | 0.002 | -0.018 | 0.028 | -0.002 |
| | (0.028) | (0.040) | (0.031) | (0.025) |
| Climate message | 0.004 | -0.049 | 0.050 | 0.003 |
| | (0.028) | (0.041) | (0.031) | (0.025) |
| Costly action message | -0.045 | -0.056 | 0.015 | -0.048* |
| | (0.027) | (0.042) | (0.030) | (0.024) |
| Combination message | 0.004 | -0.018 | 0.011 | 0.025 |
| | (0.025) | (0.039) | (0.031) | (0.022) |
| *Difference in treatment effects* Republican | | | | |
| Combination - climate | 0.001 | 0.031 | -0.039 | 0.021 |
| | (0.029) | (0.044) | (0.033) | (0.024) |
| $R^2$ | 0.75 | 0.60 | 0.57 | 0.66 |
| N | 7531 | 7554 | 7556 | 7548 |

* $p < 0.05$, ** $p < 0.01$, *** $p < .005$ (two-sided). OLS models with robust standard errors. The sample here consists of Republicans and Democrats. The composite scale is based on factor scores from the individual measures. Measure 1 refers to the respondent's beliefs regarding the extent to which environmental scientists agree among themselves about the existence and causes of global warming. Measure 2 refers to the respondent's beliefs regarding whether or not the world's temperatures are increasing. Measure 3 refers to the respondent's beliefs regarding whether the rise in the world's temperatures is being caused mostly by human activity or mostly by natural causes. Republican respondents who recognized a Democratic governor in their treatment article are omitted.
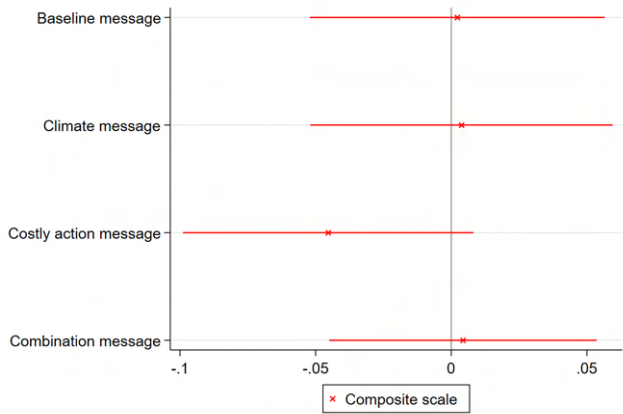
Figure C3: Exploratory Study 2 treatment effects on belief in anthropogenic climate change
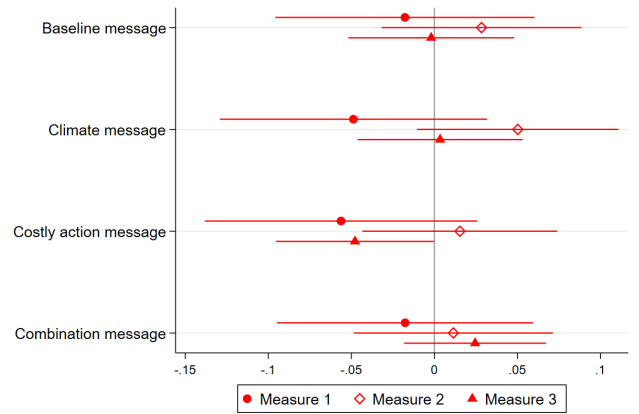
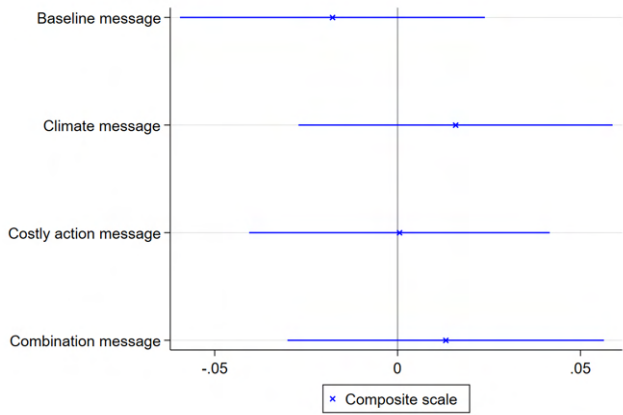(a) Composite scale (pooled)
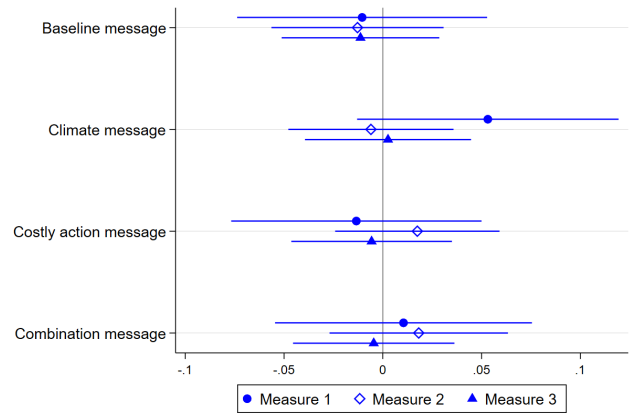
(d) Individual measures (pooled)

(b) Composite scale (Republicans)

(e) Individual measures (Republicans)

(c) Composite scale (Democrats)

(f) Individual measures (Democrats)

Estimates for which the confidence intervals do not intersect the vertical line at 0 represent statistically significant treatment effects at the 0.05 level relative to the pure control condition. The composite scale is based on factor scores from the individual measures. Republican respondents who recognized a Democratic governor in their treatment article are omitted.