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Whose Policy Is It Anyway? Public Support for Clean Energy Policy Depends on the Message and the Messenger

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Abstract

Environmental policy advocates are increasingly proposing “bundled” clean energy policies to combat climate change while also creating jobs and transforming the economy. While such strategies may broaden the appeal of climate policies, these broad constituencies create challenges for policy communicators – how do messages about different aspects of the policy, coming from different messenger groups, influence public support for clean energy policies? This study uses a modified conjoint survey experiment (n=2145) to test how the interaction between message frames (addressing climate change vs. creating jobs) and sources (business, environmental, or labor groups) influenced policy support for clean energy policies. Results show that job creation frames from business or environmental groups were most effective. We find evidence that certain message/source combinations work across partisanship divides: messages that were effective for one partisan group did not backfire – and often also increased policy support – when presented to the other group.

Keywords: clean energy, climate change, framing, source effects

Study preregistered through egap Registry: # 20190819AB

Introduction

Policy solutions to address climate change in the United States have faced significant roadblocks. No major policy designed to mitigate climate change has ever passed through Congress despite numerous attempts over the past two decades (Congress Climate History 2017). Additionally, climate change has become one of the most polarizing issues in modern American politics, resulting in deep legislative gridlock (Dunlap, McCright, and Yarosh 2016; Egan and Mullin 2017; Norman 2017).

Democrats and Republicans – at both the elite and mass public levels – differ significantly in their concern about climate change and whether they think that addressing it should be a policy priority. While 85% of Democrats believe that Congress should be doing more to address climate change, only 40% of Republicans agree with that statement (Kennedy and Hefferon 2019). This partisan division leads to a lack of cohesive pressure on lawmakers to develop and pass legislation to address the issue.

While the direct connection between public opinion and policy outcomes can be uneven due to the strong lobbying power of special interests (Burstein 2003; Klein 2015), the democratic ideal of elite responsiveness to public opinion remains a core tenet of American political institutions (Burstein 2010; Shapiro 2011). While government responsiveness to climate change has lagged public opinion on climate change (Tyson and Kennedy 2020), recent shifts in position on climate change and clean energy among previously skeptical lawmakers suggests that public opinion can influence the attitudes of political elites (Chapman 2020) (see, for example, shifting positions among North Carolina lawmakers attributed to growing support for climate policy in the state (N&O Editorial Board 2018)). Pockets of grassroots political pressure in favor of climate change policies from younger Republicans also signal a potential opportunity to broaden the appeal of climate policies on the right (Brady 2020). However, ongoing Republican opposition to climate change policies demonstrates the still-fraught path to bipartisan support for climate change policies (Milman 2021).

To build broader support for climate change and clean energy policies, and therefore increase electoral pressure on policymakers, advocates have recently set their sights on policy concepts that prioritize the transition to clean and renewable energy through green economic development, such as a Green New Deal. While previous climate change proposals have focused primarily on environmental outcomes, the narrative around “bundled” policies extends the conversation to the shared social and economic outcomes of clean energy. Consequently, these proposals subvert one of the most pervasive tropes about climate action – that environmental benefits exist in a zero-sum relationship with economic development and job creation (Layzer 2012).

This “climate *and* jobs” rhetoric is a proven strategy to bridge the partisan divide and build bipartisan support for climate change policies (Nisbet 2009). Promoting clean and renewable energy sources consistently achieves high levels of bipartisan support among the general public, suggesting that it could be an effective way to appeal to broader constituencies (Horne and Kennedy 2019). This framing has also moved into the political mainstream, as evidenced by it being the key communications strategy behind President Joe Biden’s climate and clean energy plan for the 2020 US presidential election (Glueck and Friedman 2020).

A challenge of communicating such clean energy policies is how to effectively reach and influence the attitudes of diverse audiences without triggering pre-existing associations with highly polarizing issues like climate change – as well as social programs, health insurance, and other progressive policy goals associated with the Green New Deal (Feldman and Hart 2018). Initial measures of public opinion on the Green New Deal suggested that this type of policy could achieve bipartisan support. In a December 2018 poll – as the policy was just emerging – 81% of voters supported the Green New Deal, including 57% of conservative Republicans (Gustafson et al. 2019). However, as the policy gained national attention, it became strongly associated with partisan politics and took on the polarization associated with climate change. Within months, the Green New Deal faced significant partisan polarization; by April 2019, conservative Republican policy support for the Green New Deal had dropped to 32% (Gustafson et al. 2019).

With both socioeconomic and environmental benefits, bundled clean energy policies have the potential to appeal to a broad audience of policy supporters, beyond those who generally support climate change legislation. Clean energy bills that focus on job growth in the renewable energy sector as a solution to climate change may appeal not only to environmental advocacy groups, but also business groups and labor groups that have more diverse constituencies in terms of partisanship. Recent work shows evidence that bundling climate change policies with other economic and social reforms can increase overall support for these policies (Bergquist, Mildenerger, and Stokes 2020). However, Bergquist et al. (2020) also find that support for different aspects of the Green New Deal varies between demographic groups.

To appeal to a broad audience of potential policy supporters, therefore, advocates must identify how framing a policy in different ways resonates with different audiences. While prior research has investigated how message framing and message source influence climate change policy support independently, little research has investigated the combined effects of message *and* source. Since it is impossible to communicate a policy message in the real world without also sending source cues, understanding the interaction between these two effects is an important contribution to the literature.

This study investigates how message and messenger framing on clean energy policy influences policy support across the political spectrum, with a focus on the interaction between these two effects. Does support increase if the policy is framed as a climate-oriented or jobs-oriented policy? Which sources (i.e., environmental, labor, or business groups) are considered credible on these messages, and how does message source affect policy support? And how does the interaction between message framing and source effects impact respondents' policy support? Finally, given the high levels of partisan polarization on environmental policies, we investigate how these findings vary based on partisan identity and prior attitudes towards climate change.

In the next section, we review the literature on how individuals form attitudes about clean energy policies, including the effects of jobs vs. environment framing and message source. We then describe the experimental methods of this study, which used a modified conjoint method in an online survey to test how various message and source combinations influenced policy support for several hypothetical bills. Finally, we discuss our results and implications for efforts to effectively communicate on clean energy policies.

Background

Information processing theory describes the public as generally under-informed when it comes to making policy decisions, particularly on science-based issues like climate change (Bartels 2002; Wood and Vedlitz 2007; Zaller 1992). Most individuals know little about the details of policy proposals. Instead, faced with making decisions about policy questions, individuals are likely to rely on cues from their political ideology, identities, and/or sources that they trust (Krosnick, Holbrook, and Visser 2000; McCright 2011). Policy messages can send signals that influence perceptions through varying message framing, message source, and the combination of these factors.

Jobs vs. Environment Framing

Attitudes are a weighted sum of all of an individual's preferences and considerations about an issue (Azjen and Fishbein 1980; Nelson, Oxley, and Clawson 1997). Every individual has a combination of negative and positive evaluations of an issue based on its different dimensions (Chong and Druckman 2007). Framing, then, is a communication technique that seeks to change the dimensions on which the individual considers the subject. A messenger can highlight certain features of a policy to emphasize various dimensions of the policy over others (Entman 1993; Jacoby 2000; Nisbet 2010). This leads individuals to form their attitudes by considering certain aspects of the issue evaluation more prominently than others, and has been shown to effectively influence attitudes on issues (Nisbet 2009; Spence and Pidgeon 2010).

Scholars have closely studied how to frame climate change and environmental policies in ways to increase public support for such policies. For example, climate change policies are frequently presented as a tradeoff between economic and environmental risks, based on the idea that protecting the environment costs money, risks jobs, or otherwise threatens economic growth (Antonio and Brulle 2011; Layzer 2012). Research on this jobs-environment tradeoff has found that it is a salient frame in voters' minds, and a major driver of opposition to climate and clean energy policies (Räthzel and Uzzell 2011). By emphasizing the economic costs of a climate change policy, communicators can heighten a voter's concern about the negative impacts of the policy and decrease policy support.

To counterbalance this perception of a negative trade off, communicators have used "green jobs" frames to promote climate change policies that emphasize a win-win paradigm (Kammen and Engel 2009; Kouri and Clarke 2014). These frames package environment and jobs frames together, emphasizing the economic benefits that come with increased investment in clean energy in the form of new jobs created in the renewable energy fields. Thus, they offer a best-of-both-worlds perspective on climate change and clean energy policy. For instance, the Green New Deal Network, a multi-racial, cross-class coalition of NGOs which advocates for bundled clean energy policies, is explicit in foregrounding this messaging, stating that they will deliver "clear air, clean water, safe communities, good jobs and a growing economy... we cannot think about these issues in siloes" (Summers 2021).

This messaging approach is also grounded in evidence. Past research has found that the prospect of job growth that comes with investment in clean energy is real, and that the relationship between environmental policies and job creation is generally net-positive in the short, medium and long terms (Bezdek, Wendling, and DiPerna 2008; Fankhauser, Sehleier, and Stern 2008).

A similar type of policy design, revenue-neutral green taxation, has also evolved to address the perceived tradeoff between environmental and economic gains. While not focused specifically on job creation, these policies tax carbon emissions while returning revenue back to the public through dividend payments. This type of policy theoretically appeals to those concerned about the economic impacts of climate mitigation, although both framing research and practical experience show a more muted effect on overall policy support.

While some surveys find broad public support for revenue-neutral carbon taxes (Leiserowitz et al. 2016), Dolšak et al. (2020) test various combinations of carbon tax revenue designs and find that revenue neutral designs receive less overall support than taxes that invest revenues in additional climate change mitigation. Similarly, numerous revenue-neutral carbon tax policies proposed in legislatures across the United States in recent years have failed to garner enough public support for passage. One explanation for this may be that the communication strategies for these policies, while ameliorating concerns about economic harms of taxation, fail to emphasize salient economic benefits such as job creation. For instance, Initiative I-732, a proposed carbon tax for Washington State, lost decisively in 2016 due in part to a perceived lack of specificity for how it would directly benefit citizens (Roberts 2018).

While policies that create jobs in the clean energy sector have a clear economic benefit, scholars have only recently begun to evaluate the effectiveness of these green jobs frames on influencing attitudes towards policies designed to both bolster economic growth and environmental protection. Stokes and Warshaw (2017) find that emphasizing the job creation and public health benefits of renewable portfolio standards significantly increases public support for these policies across every state. Bergquist, Mildenerger, and Stokes (2020) used a conjoint experiment to investigate how bundling various aspects of social, economic and climate change policies influenced public support for policies. They found that bundling increased support particularly among Democrats and people of color, while avoiding backfire effects among Republicans. However, that study focuses on the components of the policy and not how it is communicated. Similarly, Stokes and Warshaw (2017) contributes to our understanding of framing effects of bundled policies, but not the source of those messages. This current study builds on these findings by testing how the messaging around a policy itself (including which sources a policy message comes from) contributes to public support of the policy, particularly across partisan divides.

Source Effects

In addition to message effects, framing is dependent on the source, or messenger, of political information. Source cues, such as partisan affiliation or other group identifiers, can shape a recipient's cognition and behavior depending on that individual's affinity for those groups, with potentially complex interactions between source and message on framing (Cohen 2003; Goren, Federico, and Kittilson 2009). For instance, Kuklinski and Hurley (1994) found that African-

Americans were more likely to perceive an ambiguously worded call for self-motivation as positive when delivered by a prominent African-American source but as negative when attributed to a prominent White source. Meanwhile, McGraw et al. (2002) find that in situations of out-group communicators presenting in-group messages, partisans may penalize a speaker who they perceive to be inauthentic and pandering.

The magnitude and direction of source effects are determined by the perceived credibility of a given message source (Bolsen, Palm, and Kingsland 2019; Druckman 2001; Druckman and Bolsen 2011). Building on individual assessments of trust, source credibility refers to “the degree of shared and generalized confidence in a person or institution based on their perceived performance record of trustworthiness,” (Renn and Levine 1991, 53). Furthermore, source credibility can be broken down into two components: the perceived knowledgeability of the source on the subject at hand and the relatability of the source to the audience (Druckman and Lupia 2000; Lupia 2013). Trust in the source of a message can be considered a heuristic, or a mental shortcut, informing how people filter information and make decisions (Renn and Levine 1991). When the source of a message is deemed credible or trusted, messages from that source are more likely to be persuasive for the recipient.

Source credibility is particularly relevant on issues that are highly polarizing such as environmental policy. Kim and Kim (2014) found that credible and trusted sources of green messages led to more behavior change. More recently, Bolsen et al. (2019) found evidence that climate change messages that come from a source perceived as credible (military leaders) increased perceptions of the threat of climate change. This study, however, does not directly measure source credibility at the individual level, instead relying on generalized perceptions. Other studies have found conflicting results – a study manipulating the source of a message about climate change (corporate or government) found that attitudes towards each source did not moderate the effectiveness of the message at influencing policy attitudes (Diamond, Bernauer, and Mayer 2020).

Given the nature of bundled clean energy policies, which often receive support from many different sources (e.g., environmental groups, business groups, and/or labor groups), these inconsistent results represent a potential gap in the literature. Since individuals may have varying levels of trust in these diverse sources, it is important to understand how the perceived credibility of a particular source might impact the overall effectiveness of clean energy policy messages.

While existing literature has evaluated the roles of message framing and source effects mostly independently, the reality of political communication is that messages are never divorced from their source (Zhou 2016). Therefore, it is imperative for researchers to consider how the interaction between message frame and source cues influence public support for clean energy policies, which is the focus and contribution of this study.

Methods

Design¹

Because the intent of this study is to understand the combined effects of message source and frame, we selected an experimental design that would allow us to manipulate multiple aspects of each stimulus at the same time. Following the example of Stokes and Warshaw (2017), we used an experimental design similar to a conjoint design except with respondents evaluating short randomly-generated vignettes rather than comparing two alternatives in a table, as with a traditional conjoint experiment. Conjoint experiments allow researchers to determine which elements in a multidimensional treatment produce an observed effect, while also allowing for the inclusion of many more dimensions than normally possible (or advisable) in a traditional survey experiment where each additional dimension compounds statistical power constraints (Hainmueller and Xu 2013). However, the usual setup for a conjoint only allows respondents to adjudicate between two sets of alternatives, which may appear artificial or limiting compared to a vignette. This conjoint-like approach thus allows for greater statistical power compared to a traditional vignette-based survey experiment, where a sample is split into subsamples for each experimental condition, while providing more design flexibility than a traditional conjoint experiment.

The experimental module consisted of exposure to a randomly assigned vignette followed by questions regarding that vignette, repeated three times (each respondent read three different vignettes in total). Each vignette contained a description of a hypothetical clean energy bill with a message frame component and a source component. We included two message frames: one identifying the climate benefits of the bill and one focusing on the job creation potential. Support for the bill was then linked to an environmental organization, a business organization, or a labor union, along with an accompanying quote emphasizing their support. The same quote was attributed to each type of source and derived from a news column praising the Green New Deal (Sachs 2019). These conditions are summarized in Table 1:

	Environmental Org	Business Org	Labor Org
Climate Frame	(T1) Environmental Org; Climate Frame	(T3) Business Org; Climate Frame	(T5) Labor Org; Climate Frame
Jobs Frame	(T2) Environmental Org; Jobs Frame	(T4) Business Org; Jobs Frame	(T6) Labor Org; Jobs Frame

Table 1: Six treatment conditions varying the source and message frame (excluding controls)

We also included “hard” controls for both message and source conditions that provided some vague and fairly anodyne description of the clean energy bill and its supporters, but with the same positive valence as the treatment conditions. This is in contrast to a “soft” control where no priming information at all is provided (see Zhou 2016). The vignette stems are included in the online supplemental materials.

¹ This research was approved by the Duke University Institutional Review Board, Protocol #2020-0014. All participants provided informed consent before beginning the survey.

Variables

Our primary dependent variable was support for the proposed bill, measured on a four-point scale ranging from “strongly oppose” to “strongly support.”² Not providing a neutral response option was intentional in order to force a choice. Since the bills are hypothetical, including a neutral option could have made it easier for respondents to not think critically about the information provided.

We included a mix of pre-treatment and post-treatment control variables, placing the respective questions before or after the treatment depending on the suspected risk of biasing analysis through conditioning on affected post-treatment variables (Montgomery, Nyhan, and Torres 2018). Before exposure to the experimental module, respondents were asked about their interest in politics and perceptions of source credibility on clean energy for the sources included in the experiment, and their level of personal concern about climate change. Interest in politics was a proxy for degree of political sophistication and propensity to engage in politically motivated reasoning (Taber and Lodge 2006). Source credibility was an index for each group made up of a question on the perceived knowledgeability and a question on the perceived trustworthiness of each group when it came to “the topic of clean energy (solar power, wind power, etc.)” (Druckman and Lupia 2000; Lupia 2013).

Source credibility was measured using an additive index of how knowledgeable and trustworthy respondents considered these sources on the topic of clean energy. Concern about climate change was measured on a four-point scale of climate change being “not a problem” to “a very serious problem,” but was translated to a dichotomous variable because responses were highly skewed towards greater concern, with 24% of respondents reporting that climate change was a “somewhat serious problem” and 56.4% saying it was a “very serious problem”. Given that this measure was meant to distinguish between those who were greatly worried about climate change from those who were not, respondents who viewed climate change as a “very serious problem” were coded as “1” and those who viewed it as less serious were coded as “0.” A Pew Research Center poll from October 2019 using the same question wording similarly found 53% of respondents in the “very serious problem” category (Pew Research Center 2020).

Our post-treatment control variables included standard measures of political party identification, political ideology, race, age, gender, education, and income, all of which have been previously linked to climate attitudes (McCright and Dunlap 2011). We chose to ask about party identification and ideology post-treatment to avoid the potential priming effects of partisan identity, the leading determinant of climate attitudes among Americans (Egan and Mullin 2017). The full instrument is included in the online supplemental materials.

Sample

Data was collected in August 2019 using Prolific, an online sampling firm similar to Amazon Mechanical Turk but more explicitly focused on supporting academic research. Prolific’s user

² A four-point scale was used, as opposed to a dichotomous support/no support variable, in order to ascertain more nuance in how information influences level of support. Robustness checks were run using a dichotomous version of the variable, and the results were maintained. Results can be found in the online supplemental materials.

base, while not statistically representative of the American public, nevertheless provides a large, diverse, and reliable platform for social science experiments (Palan and Schitter 2018). A recent study comparing Prolific with Amazon’s Mechanical Turk and other similar platforms found that samples from the Prolific platform were more naïve, more diverse, less dishonest, and generally of a higher quality for experimental research purposes (Peer et al. 2017). We also included a slight oversample of Republican respondents to counteract the lower proportion of Republicans in online panel platforms than in the national public (Clifford, Jewell, and Waggoner 2015). Participant recruitment materials contained generic statements about the topic (“Survey on current events”) in order to avoid participant self-selection based on interest in climate change or social desirability bias in either responses or participant selection.

We included a factual manipulation check in our survey instrument where we asked respondents to correctly identify the source they were exposed to in the third run-through of the experiment.³ Respondents who failed this check were removed from the dataset after a comparison of models showed better goodness-of-fit when excluding those observations.⁴ We also encountered a small number of responses from Prolific workers who took the survey twice. In these cases, we kept the first response and dropped the second.

Our final sample consisted of 715 respondents, each of whom completed the experimental module three times, providing a final total of 2145 observations. The number of observations in each experimental condition ranged from 150 to 197, with a mean of 178.75 observations per condition. In terms of demographics, our sample skewed whiter (79%), younger (median age of 32), more educated (54% bachelor’s or higher), and higher income (median annual household income between \$50,001-\$75,000), but were similar to national baselines on sex (51% female) and geography (27% urban, 58% suburban, 15% rural).

Expectations

Because this study was designed to measure the interaction between message frame and source, our expectations were based on the combination of these two effects. Additionally, due to the high levels of partisan polarization on climate change – and evidence that Democrats and Republicans hold different perceptions of environmental, business, and labor organizations – our expectations differed based on partisanship (Pew Research Center 2019).⁵

In order to observe a positive effect on policy attitudes, we expected that the source needed to be trusted and the message needed to be congruent with prior attitudes. Generally, for Democrats, environmental and labor organizations tend to be trusted more than business organizations, while

³ For more on why factual manipulation checks may be preferable to other forms of attention or manipulation checks, see (Kane and Barabas 2019)

⁴ To guard against biasing our sample by dropping respondents (see Montgomery, Nyhan, and Torres 2018), we reran our analysis including removed responses, finding similar (and slightly stronger) results as reported in this paper. We therefore chose to continue reporting our results with dropped respondents removed for consistency of remaining respondents.

⁵ For instance, from the 2016 American National Election Study, Democrats reported warmer feelings towards labor unions by nearly 20 points on a 0-100 point scale compared to Republicans, while Republicans favored big business by over 11 points compared to Democrats. There is no comparable measure for environmental organizations but Democrats reported warmer feelings for scientists by over 8 points compared to Republicans.

the opposite is generally true for Republicans. On the message framing front, both climate and jobs messages were expected to be congruent with Democrats' prior attitudes, while only the jobs message would be congruent with Republicans' prior attitudes.

Analysis

Given that we employed a repeated-measures design where each individual respondent was exposed to three experimental treatments, we analyzed the data using random-effects linear regression with the Source X Message interaction as the predictor variables. We first ran the models on the full sample to understand the overall effects of the Source X Message combinations.

We then performed subgroup analyses along party lines to study differential message and source effects, using the standard seven-point party ID scale and then collapsing down to Republicans (1-3 on seven-point scale) and Democrats (4-7 on seven-point scale). Leaners were associated with the party they most closely identified with. Those in the middle of the scale were considered as Independents and omitted from subgroup analysis due to the small numbers of Independents in our sample (n=54).

Finally, as a robustness check to account for the possibility that the partisans in our sample may have been more liberal or conservative than the general public, we also ran subgroup analyses based on *ex ante* climate change beliefs to understand how climate skeptics and those highly concerned about climate change may interpret the policy messages differently.

Results

In the sections below, we first present findings of perceived source credibility of each type of messenger on clean energy issues. We found that both Democrats and Republicans considered environmental organizations to be the most credible sources on clean energy issues. Following this, we present the results of regression models on the effect of each source and message combination on clean energy policy support, both in the full sample and in the Democrat and Republican subgroups. Our results show that in the full sample and among Democrats, almost all of the Source X Message combinations increased policy support except for the Business x Climate combination. Among Republicans, the Jobs message frame was most compelling coming from either an Environmental or Business source. We conclude with an additional robustness check demonstrating consistent results, with high climate concern respondents showing similar effects as the Democrat subgroup and low climate concern respondents showing similar effects as the Republican subgroup.

Source Credibility

Partisans differed in how they rated the three types of sources – environmental, business, and labor organizations – for their credibility on clean energy issues. Democrats rated environmental organizations as the most credible (8.1 on a 2-10 scale), with labor unions coming in second (5.03) and businesses last (4.47). These scores were statistically significantly different from each

other at $p < 0.05$ level. Republicans, meanwhile, also rated environmental groups as the most credible in this space (6.71) – though not as highly as Democrats – with businesses (5.24) taking precedence over labor unions (4.47). These scores were statistically significantly different from each other at $p < 0.05$ level.

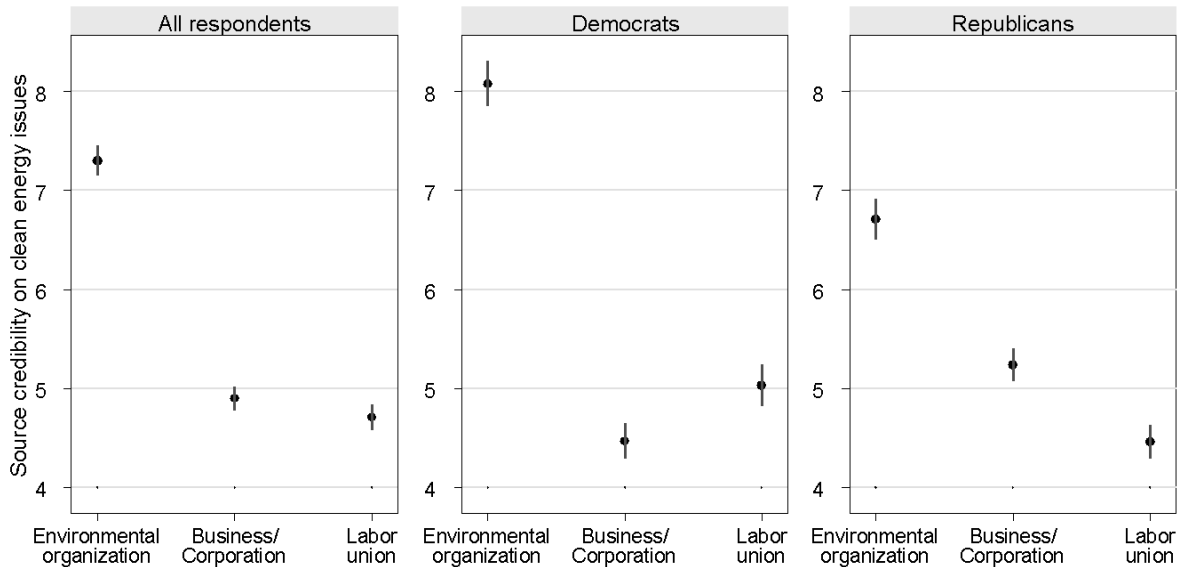


Figure 1: Source credibility scores and 95% confidence intervals among full sample and by partisan identification

Effect of Source/Message Combination on Policy Support

Table 2 summarizes the results of the random-effects linear regression models we ran with factorial interactions for each Source X Message combination, going from a limited model with the full sample (Model 1) to a fully specified model with the full sample (Model 2) to fully specified subgroup analyses of Democrats (Model 3) and Republicans (Model 4). In all of these models, the Constant term refers to the control message and control source conditions.

Model 1, which included no covariates, shows that five out of six framing conditions increased bill support relative to the control among the complete sample. Of these, the Environmental (source) X Jobs (message) condition performed best, increasing bill support by 12 percentage points ($\beta = 0.47, p < 0.001$). The Business X Climate condition was the only framing combination that did not result in a statistically significant difference in bill support from the control condition ($\beta = 0.13, p < 0.056$).

VARIABLES	Model 1: Full sample	Model 2: Full sample	Model 3: Democrats	Model 4: Republicans
Environmental X Climate	0.30*** (0.067)	0.27*** (0.066)	0.53*** (0.090)	-0.0028 (0.095)
Environmental X Jobs	0.47*** (0.065)	0.44*** (0.065)	0.50*** (0.090)	0.34*** (0.091)
Business X Climate	0.13	0.081	0.13	0.036

	(0.066)	(0.066)	(0.089)	(0.094)
Business X Jobs	0.35***	0.34***	0.22*	0.42***
	(0.067)	(0.066)	(0.090)	(0.093)
Labor X Climate	0.25***	0.24***	0.44***	0.024
	(0.069)	(0.068)	(0.095)	(0.094)
Labor X Jobs	0.26***	0.23***	0.40***	0.13
	(0.068)	(0.068)	(0.096)	(0.094)
Party ID		-0.021	-0.084*	-0.052
		(0.020)	(0.036)	(0.057)
Ideology		-0.10***	-0.038	-0.12***
		(0.021)	(0.027)	(0.032)
White		-0.050	-0.076	0.045
		(0.059)	(0.061)	(0.11)
Age		0.00061	-0.0012	0.00045
		(0.00058)	(0.0025)	(0.00064)
Female		-0.058	-0.094	0.011
		(0.048)	(0.058)	(0.071)
Education		-0.022	-0.019	-0.012
		(0.019)	(0.022)	(0.029)
Income		0.021	0.030	0.017
		(0.018)	(0.020)	(0.028)
Interest in politics		-0.087***	0.078*	-0.13***
		(0.025)	(0.035)	(0.037)
Source credibility: Environmental		0.11***	0.049***	0.15***
		(0.012)	(0.015)	(0.019)
Source credibility: Business		-0.049***	-0.027	-0.11***
		(0.017)	(0.020)	(0.026)
Source credibility: Labor		0.053***	0.0065	0.12***
		(0.015)	(0.017)	(0.026)
Constant	2.87	3.00	2.97	3.17
Observations	2,133	2,063	836	1,077
Individuals	713	688	279	359

Standard errors in parentheses.

*** $p < 0.005$, ** $p < 0.01$, * $p < 0.05$

Table 2: Regression table of results of modeled bill support with factorial interactions.

Model 2 shows similar results, with all but one of the framing conditions resulting in significantly higher bill support than the control. We found no evidence that any treatment condition significantly backfired. The Environmental X Jobs combination resulted in an 11 percentage point increase in bill support compared to the control ($\beta = 0.44$, $p < 0.001$), followed by Business X Jobs condition increasing bill support by 9 percentage points ($\beta = 0.34$, $p < 0.001$) and Environmental X Climate condition increasing bill support by 7 percentage points ($\beta = 0.27$, $p < 0.001$). These results are shown in Figure 2A.

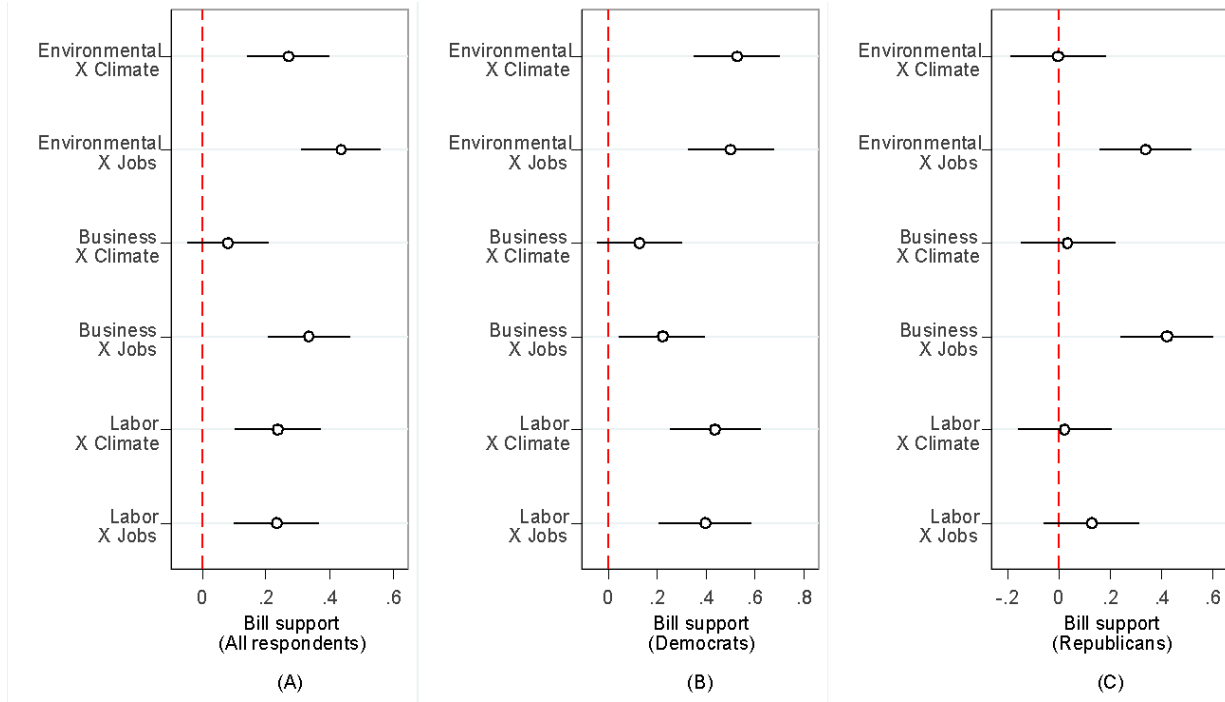


Figure 2: Marginal effects with 95% confidence intervals of Source X Message combinations on clean energy bill support, compared to control condition. Dashed vertical lines depict position of control condition. From L-R: charts show estimates for all respondents (A), Democratic respondents (B), and Republican respondents (C).

Model 3 shows that, among Democrats, almost all of the framing combinations increased clean energy policy support. For instance, the Environmental X Climate framing boosted bill support by 13 percentage points compared to the control ($\beta = 0.53, p < 0.001$) while the Business X Jobs condition increased bill support by 6 percentage points ($\beta = 0.22, p < 0.05$). The sole exception was the Business X Climate combination, which was statistically insignificant from the control ($\beta = 0.13, p < 0.14$). These results are shown in Figure 2B.

Republican respondents were more difficult to rouse when it came to the proposed clean energy bill, but two combinations of source and message framing resulting in a significant difference from the control: The Environmental X Jobs frame, which increased bill support by 9 percentage points ($\beta = 0.34, p < 0.001$), and the Business X Jobs frame, which increased bill support by 11 percentage points ($\beta = 0.42, p < 0.001$). The other treatment conditions did not result in significantly different levels of bill support from the control conditions among Republicans, despite providing more specific information in their vignettes. Figure 2C shows these results.

Consistent with the canon of American politics, political party identification and political ideology were strong explanatory variables for bill support in both the full sample and the partisan subgroups, with lower party identification and political ideology scores (i.e., stronger Democratic identity and more liberal ideology, respectively) predicting stronger bill support. Personal interest in politics was another significant, yet polarizing, predictor of bill support for the hypothetical clean energy bill. Interest in politics was positively associated with bill support

for Democrats and negatively for Republicans – in accordance with the literature on partisan motivated reasoning on many environmental policy issues (Hart, Nisbet, and Myers 2015; Kahan et al. 2012).

To protect against the possibility that our online panel of respondents may be somehow unrepresentative of partisans more generally – e.g., the concern that the self-identified Republicans in our sample might be more liberal than their offline counterparts (see Berinsky, Huber, and Lenz 2012) – we repeated our subgroup analysis by degree of pre-treatment concern about climate change instead of partisanship. In other words, we measure how our source and message framings affect clean energy bill support for those who are deeply concerned about climate change (n=1209) and, crucially, for those who downplay or dismiss the issue (n=933). These results are shown in Figure 3. We found results very similar for those with high climate concern and low climate concern as Democrats and Republicans, respectively, suggesting that our results split out by partisanship (as in Figure 2) do not minimize climate skepticism.

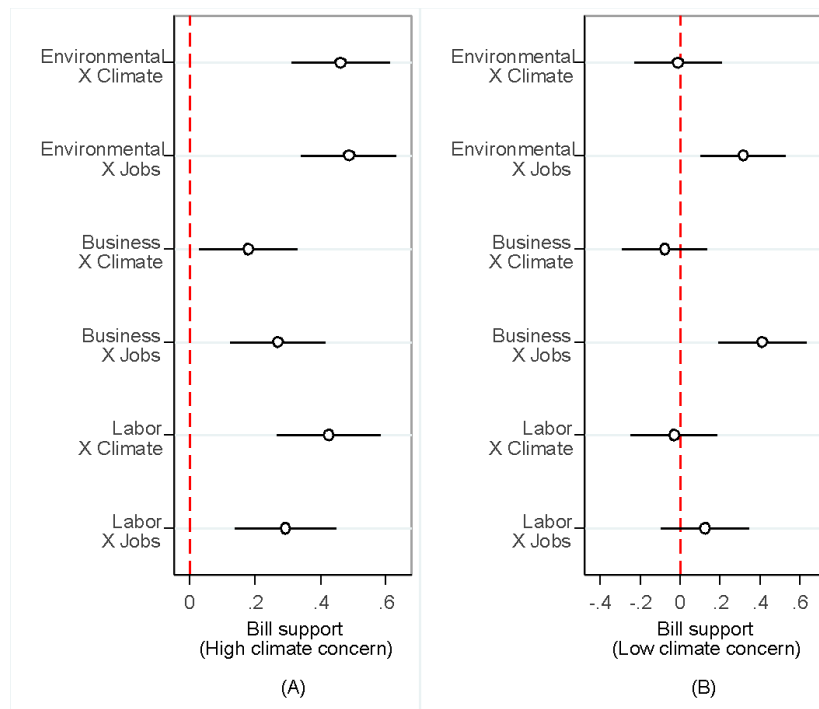


Figure 3: Marginal effects with 95% confidence intervals of Source X Message combinations on clean energy bill support, compared to control condition. Dashed vertical lines depict position of control condition. From L-R: charts show estimates for respondents with high pre-treatment climate concern (A) and low pre-treatment climate concern (B).

Discussion

As “bundled” clean energy policies that seek to address climate change as well as other social and economic issues gain popularity and appeal to broad coalitions of supporters, we must understand how both the framing of the policy and the organizations or movements associated with the policy impact public opinion. To that end, this study tested how the combination of

message frame (climate or jobs-focused) and source (environment, business or labor organization) influenced public support for clean energy policies.

Our findings generally demonstrate that both the message frame and the source are important considerations when communicating clean energy policies. In the full sample, all of the Source X Message frame combinations increased policy support except for the Business X Climate frame combination. The Environmental X Jobs frame combination resulted in the strongest increase in policy support in the full sample. While the intent of this study was not to evaluate the independent effects of message or source, results suggest that overall the jobs frame is more universally influential than the climate frame, particularly due to its appeal among Republicans. Meanwhile, environmental groups were seen as credible messengers by participants of both parties.

Reflecting the highly polarized nature of climate change in the United States, the appeal of different Source X Message combinations varied by partisanship. The results for the Democrat subgroup were generally similar to the full sample, although the Environmental X Climate frame combination performed more strongly, and the Business X Jobs frame performed less strongly, than among the full sample. Messages from environmental and labor groups were similarly effective among Democrats while messages from business sources were less effective. This was expected as Democratic respondents reported higher levels of source credibility for environmental groups and labor groups than business groups on clean energy issues, and Democrats have generally been highly supportive of climate change policies since the issue first emerged into the national consciousness in the late 1980s.

Republicans, meanwhile, were only responsive to jobs-based messaging and only when it was presented by environmental or business groups and not labor groups. This suggests that bundling climate policies with a promise of increasing jobs may be necessary to attract Republican policy support. Additionally, Republicans are open to receiving messages about such policies from either business or environmental groups, but not labor groups. These findings are consistent with how Republican respondents in our sample judged the source credibility of these three groups on clean energy issues prior to the experimental treatment. This suggests that associating the job creation narrative of bundled climate policies with labor groups might counteract any positive effect of the jobs frame among Republican voters.

Another question worth exploring is whether or not “climate change” acts as a trigger word in messaging. Among Democrats, the climate frames performed strongly, although only when presented by a trusted source (i.e., environmental or labor groups). Among Republicans, the climate frames resulted in no increases in policy support, even when they came from a credible source. This suggests 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. This finding aligns with the “on-line” model of opinion formation that argues that people form attitudes by using a running tally of their affective evaluations of an issue when they encounter information (Lodge, McGraw, and Stroh 1989).

It is possible, therefore, that mentioning climate change could evoke negative affect among Republicans and eliminate any possible positive effect of the message. While we did not test this

effect directly, this is a worthwhile area for future research to understand the independent effect of “climate change” as a negative trigger word and the psychological mechanisms at play in that scenario.

We did not observe any backfire effect that some literature suggests may occur among Republicans facing a climate change message (Hart and Nisbet 2012; Zhou 2016). While backfire effects are generally rare and tend to be observed only under specific conditions, the fact that none of the Source X Message combinations decreased policy support is also notable. This suggests that none of the framing combinations tested in this study are likely to have a deleterious effect on policy support, even if some are more successful than others at increasing policy support.

While clean energy may not be as polarized a subject as climate change, our measure of personal interest in politics did have a polarizing effect on bill support (measured as a covariate effect). Having a personal interest in politics was significantly associated with increased bill support for Democrats and significantly associated (with nearly twice the magnitude) with decreased bill support for Republicans. Given that personal interest in politics is a strong component of political motivations, we suspect this result speaks to the ability of savvy partisans to make the connection between climate and clean energy policies (Taber and Lodge 2006). This also suggests a limitation to the effectiveness of framing efforts around bundled clean energy policy – no matter how someone frames the policy, it may be unlikely to change attitudes among politically sophisticated voters.

For climate change communicators, our research shows that the American public is largely receptive to climate and clean energy policies that are centered around a socioeconomic jobs argument, though understanding the nuances of individual audiences will be key for political communication to stick. In particular, we find that Democrats support a wide variety of messengers and justifications for substantial clean energy policies (outside of business groups speaking on climate) and are already receptive to jobs-based messaging from non-environmental sources like labor unions and business groups. Meanwhile, Republican audiences may only be moved by sources they feel affinity towards (business groups) and/or see as subject experts (environmental groups) who speak about the job creation benefits of clean energy policies. Source credibility seems to matter quite a bit for both these groups when it comes to clean energy policy messaging, as their measures of policy support correspond neatly with how they rated the various groups on this issue.

It is important to note some features of the experimental vignette design that may have biased participant responses. Recognizing that source credibility was important to the experiment, respondents may have reported greater support for policies from sources they find credible. While efforts were made to generalize the survey topic in the recruitment, demand effects may have led to greater differences in support based on source cue than in a non-experimental setting.

Additionally, the repeated nature of vignette experiments can lead to bias in the form of anchoring and priming effects. It is possible that the messages in the first vignettes may have primed respondents to think differently about the second and third vignettes. We attempted to pre-empt this by both randomizing vignette order and controlling for the order that each vignette

appeared to participants, but such anchoring and priming effects may still have influenced how participants responded to later vignettes.

Finally, this study involved a one-time stimulus and therefore falls victim to questions about longitudinal effects that plague most experimental studies. While treatment effects were observed, we do not know how long such effects persisted. Some studies show that there are some lasting effects of experimental effects over time (Broockman and Kalla 2016; Kalla and Broockman 2020), but it is not possible to know how long message and source effects impact public opinion on climate change. It is likely that repeated messaging is required for message and source effects to change climate change attitudes in a meaningful way.

Conclusion

As policymakers and advocates look increasingly towards bundled clean energy/job creation policies as a way to broaden support for climate change mitigation, it is important to understand how best to communicate these policies to the public. Our study shows that the combination of message and source in framing matters for resulting policy support. Specifically, in the context of clean energy policies, emphasizing the job creation aspects of these policies builds bipartisan support, primarily when those messages come from environmental or business groups. Meanwhile, labor groups are seen as less credible communicators on clean energy policies, particularly for Republicans. Advocates and policy communicators should consider using messengers that best align with their audience's preferences and emphasizing the economic benefits of clean energy policies, as situating climate policies in a broader and beneficial socio-economic context may be key to increasing bipartisan support for climate change policies in the United States.

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Online Supplemental Materials

I. Codebook/Full Survey Instrument:

<https://www.dropbox.com/s/bmna5xuibt8fnz4/Full%20codebook.docx?dl=0>

II. Treatment Messages

All experimental groups:

Next year, policymakers are set to vote on an ambitious national clean energy bill, HB 21. This bill would promote investment in clean, renewable energy throughout the country.

Message Frame:

Control

The bill offers an historic opportunity to solve critical problems in our society.

Jobs

The bill offers an historic opportunity to solve critical problems and put us on a path to grow our economy. Among the expected outcomes of this bill would be the creation of thousands of new jobs in the clean energy sector.

Climate

The bill offers an historic opportunity to solve critical problems and put us on the path toward a sustainable future. Among the expected outcomes of this bill would be the opportunity to aggressively address climate change and avoid its worst risks.

Message Source:

Control

The bill has a number of high-profile supporters.

Environmental

The bill is supported by a number of leading environmental organizations. "This bill provides a whole package deal: good incomes, social fairness, and environmental sustainability," said an environmental spokesperson.

Business

The bill is supported by a number of leading business organizations. "This bill provides a whole package deal: good incomes, social fairness, and environmental sustainability," said an industry spokesperson.

Labor

The bill is supported by a number of leading labor unions. "This bill provides a whole package deal: good incomes, social fairness, and environmental sustainability," said a labor spokesperson.

III. Dichotomous bill support analysis (robustness check)

VARIABLES	Model 1: Full sample	Model 2: Full sample	Model 3: Democrats	Model 4: Republicans
Environmental X Climate	0.031 (0.033)	0.028 (0.033)	0.11*** (0.036)	-0.054 (0.051)
Environmental X Jobs	0.12*** (0.032)	0.11*** (0.032)	0.13*** (0.036)	0.075 (0.049)
Business X Climate	0.0016 (0.033)	-0.013 (0.032)	0.064 (0.035)	-0.082 (0.051)
Business X Jobs	0.089** (0.033)	0.085** (0.033)	0.074* (0.036)	0.080 (0.050)
Labor X Climate	0.0035 (0.034)	-0.0017 (0.034)	0.076* (0.038)	-0.085 (0.051)
Labor X Jobs	0.049 (0.034)	0.041 (0.034)	0.11** (0.038)	0.00024 (0.051)
Party ID		-0.0064 (0.0091)	-0.015 (0.011)	-0.059* (0.029)
Ideology		-0.037*** (0.0096)	-0.013 (0.0085)	-0.048*** (0.016)
White		-0.0085 (0.027)	-0.0071 (0.020)	0.010 (0.057)
Age		0.00024 (0.00027)	0.000087 (0.00081)	0.000077 (0.00032)
Female		-0.025 (0.022)	-0.033 (0.019)	0.010 (0.035)
Education		-0.012 (0.0085)	0.00085 (0.0070)	-0.018 (0.014)
Income		0.012 (0.0081)	0.014* (0.0063)	0.012 (0.014)
Interest in politics		-0.041*** (0.011)	0.0076 (0.011)	-0.034 (0.018)
Source credibility: Environmental		0.036*** (0.0057)	0.0056 (0.0049)	0.059*** (0.0093)
Source credibility: Business		-0.016* (0.0076)	-0.0046 (0.0065)	-0.045*** (0.013)
Source credibility: Labor		0.021*** (0.0070)	-0.0017 (0.0053)	0.052*** (0.013)
Constant	0.77***	0.84***	0.86***	1.13***
Observations	2,133	2,063	836	1,077
Individuals	713	688	279	359

Standard errors in parentheses. *** $p < 0.005$, ** $p < 0.01$, * $p < 0.05$

Table A1: Regression table of results of modeled dichotomous bill support with factorial interactions.