Speaking through security or health? Understanding the effects of framing on climate change policy support and risk perception

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ABSTRACT (Section Word Count: 194)

Research shows that selectively emphasizing certain aspects of climate change, a process known as framing, can help effectively communicate information and persuade different segments of the United States' population. While research shows that certain frames are more effective at persuading climate skeptics (e.g., a public health frame), currently very little research on a national security frame exists. Using an online survey experiment ($N = 1,155$), this study contrasts a national security frame, a public health frame, and a control no-information frame (3 conditions) to test effects on support for mitigation and adaptation policies, as well as levels of perceived risk from the adverse effects of climate change. Our results indicate that the framing effects of both the national security and public health frames are dependent on political party. The national security frame is associated with higher levels of policy support and risk perception than the public health frame for Democrats and Independents while Republicans exposed to both frames have decreased scores compared to the control. We believe these findings offer guidance for future research into the efficacy of a national security frame at increasing support for climate action policies and levels of risk perception.

Keywords: framing, climate change, national security, public health, policy support, risk perception

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[1] This paper was written to fulfill the requirements for an undergraduate senior honors thesis set by both the O'Neill Honors Program and the Certificate for Applied Research and Inquiry program. Additionally, as this project was done as a part of the Attari Lab at the O'Neill school, "we" and "our" are used throughout the paper.

1. INTRODUCTION (Section Word Count: 427)

Researchers and policymakers alike in the United States have long been searching for a method to effectively communicate information about climate change to skeptical segments of the U.S. population. Securing support for the policies necessary to counter the adverse effects of climate change requires effective persuasion of the most skeptical segments of the US population – primarily American citizens that identify as Republicans. Selectively emphasizing certain elements of climate change, a process known as *framing*, can provide an avenue to reduce partisan divides on levels of concern about climate change and support for climate policy (Nisbet, 2009).

Several studies suggest a public health framing of climate change can help bridge the partisan divide by inspiring feelings of hope (Myers et al., 2012) and making climate change's adverse effects feel "closer to home" (Maibach et al., 2010). Compared to the public health frame, however, there is little research on the efficacy of a national security frame (Bolsen & Shapiro, 2017). This study aims to fill this gap by asking and empirically answering the following research questions: what are the effects of framing climate change as a national security issue compared to a public health issue on (1) levels of support for climate mitigation and adaptions policies, and (2) risk perception? How do these effects differ between Republicans, Democrats, and Independents?

We distributed an online survey experiment with three conditions (a national security frame, a public health frame, and a control condition) to a convenience sample ($N = 1,155$) of U.S. citizens gathered through Qualtrics Panel. After performing analysis of variance tests and t-tests, we found that a national security frame elicits higher levels of policy support and perceived risk than a public health frame for Democrats and Independents. Both frames suppressed policy support and risk perception for Republicans, with the public heath frame being particularly negatively persuasive.

Our findings did not support the expectation, grounded in decades of public opinion data (Pew Research Center, 2018), that a national security frame would be persuasive for Republicans. However, our results suggest that existing climate change literature may be overlooking the national security frame as an avenue for raising levels of policy support for Americans in the political "middle-ground" (e.g., Independents, moderates). Future research should examine: (1) why Democrats respond particularly well to a national security frame, (2) if the frames' effects depend on political ideology for Independents, (3) how Republicans respond to the selective presentation of climate change's role in shaping U.S. defense policy, and (4) finding methods of communicating the benefits of mitigation and adaptation policies without mentioning climate change.

2. LITERATURE REVIEW (Section Word Count: 1898)

2.1. Explanatory Factors for the Partisan Divide in Climate Change

Decades of public opinion research confirms a central theme in the communication of climate change: Democrats, Independents, and Republicans all view climate-related topics through drastically different lenses (McCright & Dunlap, 2011; Leiserowitz et al., 2018; Ballew et al., 2019). Pew Research Center studies from 2006 to 2016 show that Republicans rank below Independents and Democrats in trust of climate scientists, belief in the causes of climate change, the effects of climate change, perception of risks related to climate change, and the effectiveness of policies addressing the issue (Funk & Kennedy, 2016).

The intimate tie between conservatism and climate skepticism is unique to the United States (Hornsey et al., 2016) and driven largely by motivated reasoning and issue politicization (Bolsen et al., 2014). Motivated reasoning refers to the tendency for individuals to seek information that confirms or is consistent with prior beliefs (Druckman, 2015). Politicization occurs when actors deliberately emphasize the inherent uncertainty in science to cast doubt and advocate a particular political agenda (Druckman, 2015; Bolsen & Shaprio, 2017).

Hart and Nisbet (2012) examined both motivated reasoning and politicization in climate change communication to understand how these two concepts interact. The study found that whether a respondent "identified" with simulated victims of climate change depended on political partisanship, and partisanship, in turn, determined support for mitigation policies. According to the authors, a respondent's "factual knowledge about global warming" played no role in determining levels of support for mitigation policy (Hart & Nisbet, 2012, p. 15). Other researchers (Corner et al., 2015) confirm and expand on Hart and Nisbet's findings, suggesting that fact-centric climate change communications will not effectively persuade climate skeptics nor motivate believers.

2.2. Communication Frames

The experimental conditions in Hart and Nisbet's study revolved around simulated news article written by the authors to employ different *communication frames*. A communication frame refers to the words, phrases, or images that increase the saliency of an issue or topic to an audience (Bolsen & Shapiro, 2017). Framing refers to the selective emphasizing of those words, phrases, or images over others to shape how people view—and potentially believe in—a certain issue (Bolsen et al., 2018). Put simply, framing is the process of choosing *how* to communicate something (e.g., climate change) to someone (e.g., a potential voter).

Nisbet (2009) provided theoretical foundations to the field by finding that tailoring climate communications (i.e., framing) to a specific population can help change the group's level of support for climate policies and concern about the issue. Nisbet's key findings are from just one of more than 280 studies on climate change framing have been published since 1996

(Badullovich et al., 2020).[2] Many of these studies have identified key elements that contribute to the efficacy of a climate frame.

Several studies (Lewandowsky et al., 2013; van der Linden et al., 2015) found that clearly stating and emphasizing scientific consensus on climate change are key determinates to effectively increase policy support and concern levels. Corner et al (2015) outlined four key psychological factors that researchers should always consider when creating climate communications.[3] Frames also do not need to be complicated to be effective, however. Two studies found that using the phrase "climate change" instead of "global warming" made Republicans more likely to both report a belief in the topic and to support action on mitigation policies (Schuldt et al., 2015; Schuldt et al. 2017). While some studies point to the role political identification and the presence of counter frames[4] can play in diminishing the efficacy of climate frames, researchers accept that framing can provide a tangible avenue to changing the climate attitudes and beliefs.

2.3. Background and Elements of a Public Health Frame

One research team (Badullovich et al., 2020) performed a systematic review of climate framing literature and found that three climate frames (scientific, economic, and environmental) alone comprise 43 percent of the frames employed in framing studies. The authors also note, however, that the public health frame has been gaining significant attention from researchers in the past decade.

Researchers are not the only ones paying attention to the heavy toll climate change takes on public health. Attention in the research field is being paralleled by attention—and action—by policymakers and health practitioners. In August 2021, the Biden administration created the Office of Climate Change and Health Equity, the first federal office with the explicit mandate of analyzing and crafting policy solutions around the link between climate change and public health (HHS, 2021). A month later, the editors of leading global health journals released a letter stressing the effects of rising temperatures on biodiversity, global crop yields, and human health while stressing these trends' disproportionate impact on the poor, young, and elderly (Atwoli et al., 2021).

The results of studies analyzing the effects of a public health frame for climate change offer reasons for optimism. Since 2010, research has consistently demonstrated the efficacy of a

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[2] Research into framing and how it influences climate concern, motivation, and belief is a young field. While framing was first conceptualized in the 1970s, climate framing research was not frequent until the early 2000s and peaked in 2017 (Badullovich et al., 2020).

[3] From the abstract of Corner et al 2015: "The four factors are the role of values and worldviews in determining climate change views; the efficacy of 'information-based' interventions; the 'psychological distance' of climate change and message framing; and the role of trusted messengers."

[4] This is a quote from Badullovich et al 2020: "More recent research has suggested that other factors such as politically-aligned attitudes (Zhou 2016) and the presence of 'counter-frames' (Mccright et al 2016) may override framing effects."

frame emphasizing the effects of climate change on public health at closing the partisan concern and policy support gaps. The earliest work on the public health frame suggested the frame can increase the personal relevancy of climate change (Maibach et al., 2010) and make the effects of climate change feel "closer to home," thus bypassing barriers created by motivated reasoning (Bolsen & Shapiro, 2017). Other studies describe the public health frame's ability to generate positive emotions (e.g., hope) (Myers et al., 2012) and increase some groups' willingness to support government action (Hart & Nisbet, 2012). In sum, the public health frame is often cited as one of the most promising frames for climate change with regards to closing partisan divides on climate (Nisbet, 2014).[5]

2.4. Background and Elements of a National Security Frame

A national security frame for climate change is another frame of rising interest to climate change communication scholars. The adverse effects of climate change on nations' ability to keep their geopolitical, economic, and humanitarian interests secure have been examined since 1980, with some researchers arguing that environmental factors occupy "only one of many causal roles" in contributing to conflict around the globe (Levy, 1995). Recent research suggests a more direct—and increasing—link between accelerating climate change, civil conflict, and the destabilization of societies (Hsiang et al., 2011; Hsiang et al., 2013).

The process of framing political discourse in terms of U.S. national security is not unique to the domain of climate policy and action. Early examples of a national security issue frame discuss the adoption of biofuels as a method of decreasing reliance on Middle Eastern oil, thus increasing U.S. energy independence and political autonomy (Wright & Reid, 2011). Other research (Voss, 2018) points to (primarily conservative) policymakers in the U.S. framing illegal immigration as a security threat to the U.S. with the intention of diverting attention away from the issue's implications for social policy.

Analyzing the effects of climate change on U.S. national security has now firmly taken root in mainstream defense policy arenas as well. The U.S. Department of Defense (DoD) began officially documenting the effects of climate change on the nation's security in the mid-2010s. The first climate report the DoD published in 2014 established that the Department considers climate change a "threat multiplier" with the potential to exacerbate a large variety of challenges currently faced by the U.S. military (U.S. DoD, 2014, p. 2). In early 2016, the DoD issued Directive 4715.21 to provide a framework for how the Department can improve climate resilience and preparedness at the more than 7,000 bases that house U.S. servicemembers across the world (U.S. DoD, 2016). In October 2021 the DoD published a seminal risk analysis of the climate change, asserting that changing weather patterns, intensifying extreme weather events, rising temperatures and sea levels are "reshaping" the ways the DoD must think about protecting the country (U.S., DoD, 2021, p. 5).

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[5] Climate communication researchers are not unconditional in their praise of the public health frame. Walker et al (2018) points to the limitations encountered by most frames, including public health, when the frame is not viewed as credible or relevant by the target audience.

2.5. Current Research on a National Security Frame for Climate Change

Despite the substantial—and rising—emphasis on climate security in defense policy circles, academic research on a national security frame for climate change is lacking compared to the public health frame. Of the 281 framing studies reviewed by Badullovich and co-authors (2020), only 18 included a national security frame, compared to 25 with a public health frame. In a previous framing literature review (Bolsen & Shapiro, 2017), only two of the 99 studies cited included a national security frame.

Much of the earliest literature on the national security frame offers an ambiguous view of the frame's persuasive power. While some research found that the security frame did not influence support for environmental regulations (Attari et al., 2009), other authors remained confident in the long-term prospects of the frame's ability to bridge the partisan divide (Hoffman, 2011). Myers and colleagues (2012) found that a public health frame elicited "positive" emotions (e.g., hope) while framing climate change as a national security issue elicited "negative" responses (e.g., anger) – particularly from respondents that demonstrated low concern and belief in climate change. Previous research suggests anger and other negative emotions can lead to increased risk perception and policy support (Leiserowitz, 2006), but Myers and her co-authors do not speculate on whether the security frame influences support for government action or concern about climate change.

Recent research offers more positive results. McCright et al. (2016) found that a national security frame led to Republican respondents displaying more support for greenhouse gas emission reduction policies when compared to a control, although the effect was weakened by a climate denial counter-frame. Feldman and Hart's (2018) results indicate an energy security frame[6] can lead to higher policy support scores compared to a climate change frame, but the effects of the frame are dependent on political party identification and the content of the policy prompts. Both papers conclude by acknowledging that, despite the demonstrated promise for shifting Americans' views on climate change, the frame remains understudied. In short, not only is the current body of literature on the efficacy of the national security frame lacking relative to the public health frame, the research that does exist does not offer a conclusive view of the national security frame's effectiveness. These trends suggest further research on the frame is needed**.**

3. HYPOTHESES (Section Word Count: 271)

Our examination of the public health and national security frames begins at the basic level. To identify the presence of a framing effect, we want to find whether the frames can elicit higher policy support and risk perception scores than a no-information control condition. More specifically, our first hypothesis **(H1)** is that respondents exposed to the national security and

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[6] An energy security frame specifically discusses the positive correlation between usage of renewable energy can increase energy independence and political autonomy (Feldman and Hart, 2018). Energy security comprises one element of the national security frame tested in this study.

public health frames will report significantly different average policy support and risk perception scores than respondents in the control condition.

Next, we will examine whether a national security frame is more effective for Republicans than Democrats. Specifically, we hypothesize **(H2)** that there will be a larger difference in policy support and risk perception scores between Republicans in the control and national security conditions than for Democrats and Independents in the same conditions. This hypothesis is grounded public opinion research. In 2018 the Pew Research Center published data showing that 80 percent of respondents have "a great deal" or a "fair amount" of confidence in the military. The survey also found that Republicans expressed more confidence in the military (92%) than Democrats (73%); this gap has not shifted much since 2016.

Lastly, we want to evaluate **(H3)** whether a national security frame will be better at yielding higher policy support and risk perception measures for Republicans than Democrats compared to the public health frame. Because of the polarizing nature of policies enacted in response to COVID-19, it could be possible that our study is affected by decreased trust in public health officials. For several decades, both the U.S. military and public health officials have enjoyed consistently high confidence levels (Pew Research Center, 2018).

4. DATA AND METHODS (Section Word Count: 423)

To gather data for this study, a total of 1,155 respondents recruited from across the U.S. via Qualtrics Panel completed an online survey experiment between October and November 2021.[7] Survey experiments are the most popular method for experimental studies on climate frames and framing, although most studies employing surveys only gather between 101 and 500 responses (Badullovich et al 2020). To ensure data quality, we removed a total of 75 respondents who failed an attention check so a total of 1,080 respondents were included for analysis.

Upon beginning the survey, all respondents were asked nine demographic questions, including their identification with U.S. political parties. Political party identification (or "party I.D.") refers to the political party—or lack-there-of—with which a respondent self-identifies with (e.g., Republican, Democrat, and Independent). We primarily sorted respondents along the lines of political party identification and used coded quotas to gather between 347 and 370 respondents for each party I.D. Between 107 and 128 respondents of each political identification were randomly assigned to one of three conditions upon beginning the survey: (1) a control frame condition which contained no text, (2) a framed article highlighting the *public health* elements of climate change, or (3) a framed article highlighting the *national security* elements of climate change.[8] The framed articles used in the study were modified versions of articles used by Myers and co-authors (2012) in a study examining emotional reactions to climate frames.

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[7] Qualtrics Panel is an online survey platform that compensates respondents for their participation in surveys. Qualtrics did not provide exact details on how much respondents were compensated; we were told respondents earned between $0.50-$5.00.

[8] Badullovich and team's (2020) systematic review of climate framing literature found that the public health (N=16) and national security (N=9) frames are the second and fourth most studied frames in

We acknowledge that our usage of a non-probability convenience sample provides reason for external validity concerns. While random probability samples are the gold standard for survey research, recent studies suggest that Qualtrics Panels offers clear advantages in sample representativeness and performs better in univariate and multivariate analyses when compared to Amazon MTurk and other online panels (Zack et al., 2019; Boas et al., 2020). Additionally, we employed quotas to balance our sample along the lines of gender, age, U.S. Census region, education, income, and ethnicity. The framed articles, details on the changes made to each, and the full demographic characteristics of our sample are detailed in the **Tables A1-A4** in the **Appendix**.

5. MEASURES AND METHODOLOGY (Section Word Count: 727)

5.1. Identification of Independent and Dependent Variables

The independent variables in this study are the framed articles, while political party identification and other demographic variables offer explanatory insight for our findings. We employ the framed articles to affect our two key dependent variables: *policy support* and *risk perception*. We asked respondents a total of 15 questions to measure the effects of the frames on our dependent variables.[9] A complete copy of the survey is included in the **Appendix**.

5.2. Dependent Variable 1: Policy Support

To measure levels of policy support, we asked respondents if they supported or opposed nine (9) specific policies that either *mitigate* the adverse effects of climate change or help the U.S. *adapt* to climate change.[10] The policies presented to respondents were evenly split into three categories: policies with *no theme* (3), a *public health* theme (3), or a *national security* theme (3). We asked respondents to rate their degree of support or opposition to the policy along a Likert scale (e.g., strongly support, support, neither support nor oppose, oppose, strongly oppose). All nine policies are displayed in **Table 1** below.

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experimental studies (*N*=63), respectively. The environmental frame was the most common (*N*=31). Additionally, over half of the examined experimental studies (*N*=35) used control frames.

[9] Expanding on Note 1: the current version of this paper does not report results from nor analyze all the data gathered from the entire survey. This iteration focuses on the indexed dependent variable scores and displays and discusses the individual policies and risk perception groups.

[10] In addition to the "simple" policy support questions, we presented we presented respondents with a point allocation question. Respondents were asked to allocate 100 points amongst the nine policies presented to them to indicate how the respondents would prioritize each policy in comparison to the others.

Table 1 -- All nine policies displayed in survey, broken down by policy "theme"

Individual Policies	Variable Name
General (No) Theme	
1. Planting forests for carbon capture	PolSupp_Forest
2. Providing funds for managed retreat	PolSupp_ManRe
3. Transition U.S. to carbon free power	PolSupp_CarbonFree
Public Health	
4. Create organization to track climate-related diseases	PolSupp_DisOrg
5. Establish a national zero emissions public trans. standard	PolSupp_Zem
6. Build publicly accessible cooling centers across the U.S.	PolSupp_Cool
National Security	
7. Shift the operational energy mix of the U.S. military	PolSupp_OpEnergy
8. Construct resilient infrastructure at U.S. military bases	PolSupp_ResInfra
9. Relocate U.S. military from flood prone areas	PolSupp_Leave

Respondents were asked to "please indicate to what degree you support or oppose the following policy."

5.3. Dependent Variable 2: Risk Perception

We also measured respondents' levels of risk perception. Risk perception refers to a respondent's attitude about the "extent to which [climate change] is causing harm now and / or will cause harm in the future to different people" (Ballew et al., 2019, p. 7). To measure risk perception, we asked respondents to rate how they believe climate change will harm seven (7) groups along a Likert scale (e.g., not at all, only a little, I don't know, a moderate amount, a great deal). The seven groups, displayed in **Table 2** below, incrementally increase in both spatial and temporal distance from respondents.

Table 2 -- All seven risk perception groups displayed in survey

Risk Perception Groups	Variable Name
1. You personally	RiskPer_Pers
2. Your family	RiskPer_Fam
3. People in your neighborhood	RiskPer_Comm
4. People currently living in the U.S.	RiskPer_inUS
5. People currently living outside the U.S.	RiskPer_outUS
6. Future generations of people in the U.S.	RiskPer_FutUS
7. Future generations of people around the world	RiskPer_FutW

Respondents were asked "how much do you think climate change will harm…?" the seven groups above.

5.4. Preparing Dependent Variables for Analysis

To analyze respondents' levels of policy support and risk perception, we averaged together (or "indexed") each respondent's scores for each of the nine of policies and seven risk perception scores. To judge whether we could use the indexed policy support and risk perception scores in our analysis, we created Cronbach alphas (displayed in Table 03 below) to judge the scores' fit.

Table 3 -- Cronbach alpha scores for policy support and risk perception indexes

Indexed Scores	Alpha score
Policy Support	0.91
Risk Perception	0.95

Both alpha scores are above 0.9, indicating that both indexed dependent variable measures are strong measures of similar data. This confirms that we can perform analysis of variance (ANOVA) tests and *t*-tests on indexed scores for policy support and risk perception to examine the effects of our experimental conditions among the groups in our sample.

6. RESULTS (Section Word Count: 1223)

6.1. Mean Scores for Dependent Variables

Table 4 below displays the mean scores for policy support and risk perception across all three political party identifications. Respondents who identify as Democrats display the highest levels of both policy support and perceived risk. Independents possess significantly lower scores than Democrats for both dependent variable measures, and Republicans display the lowest level of policy support and risk perception of all three political identifications.

Table 4 -- Mean scores for policy support and risk perception

Dependent Variable Mean Scores	Democrat (*N*= 363)	Independent (*N*= 347)	Republican (*N*= 370)
Policy Support (Indexed)	1.30	0.88	0.46
	(0.03)	(0.04)	(0.05)
Risk Perception (Indexed)	2.39	2.05	1.60
	(0.03)	(0.04)	(0.05)

Policy support was measured on a scale of -2 (strongly oppose) to +2 (strongly support). Risk perception was measured on a scale of 0 to 3, with each +1-increase indicating a higher level of concern about the adverse effects of climate change. Standard errors are indicated in parentheses.

6.2. Analysis of Variance in Dependent Variables

We ran a total of six one- and-two-way ANOVA tests to examine whether party identification and condition can account for differences in mean policy support and risk perception scores. The one-way ANOVA tests measured differences in mean scores by condition and party identification individually, while the two-way tests measured the interaction effect of the two variables. The results of the ANOVAs are displayed in **Table 5** below.

Table 5 -- Results of one- and-two-way ANOVA tests

Dependent Variable Indexes	One Way			Two Way		
	df	F value	*p* value	df	F value	*p* value
Policy Support						
Condition	1	0.426	0.514	1	0.520	0.471
Party ID	1	226.2	0.000	1	228.253	0.000
*Condition * Party ID*				1	9.928	0.002
Risk Perception						
Condition	1	1.113	0.292	1	1.298	0.255
Party ID	1	176.6	0.000	1	176.479	0.000
*Condition * Party ID*				1	3.841	0.050

Table 3 confirms that, alone, a respondent's randomly assigned condition is not a statistically significant indicator of differences in policy support or risk perception scores. In contrast, a respondent's political party identification is a highly significant indicator ($p = 0.000$) of dependent variable scores. The two-way ANOVA tests indicate that condition can account for differences in mean policy support ($p = 0.002$) and risk perception ($p = 0.05$) scores, but this explanatory power is dependent on a respondent's political party identification. To measure the interaction effect between condition and party identification, we ran 18 t-tests to examine which condition and party groups have statistically significant differences in their scores. The full results of the t-tests are displayed in **Tables A7-A12** in the **Appendix**.

6.3. Results for Policy Support

As **Figure 1** below displays, Democrats in both experimental conditions have significantly higher levels of policy support than Democrats in the control condition. Democrats in the public health condition have a 0.12-point higher overall policy support score in comparison to Democrats in the control condition ($p = 0.09$). The difference in mean policy support scores between Democrats in the national security condition and the control was both larger and statistically significant ($+0.21$, $p = 0.004$). The difference in mean policy support scores for Democrats in the two experimental conditions is not statistically significant ($p = 0.187$). For both Democrats and Independents, across both dependent variables measures, the difference between the control and national security groups' mean scores is larger than the difference between the control and public health groups' scores.

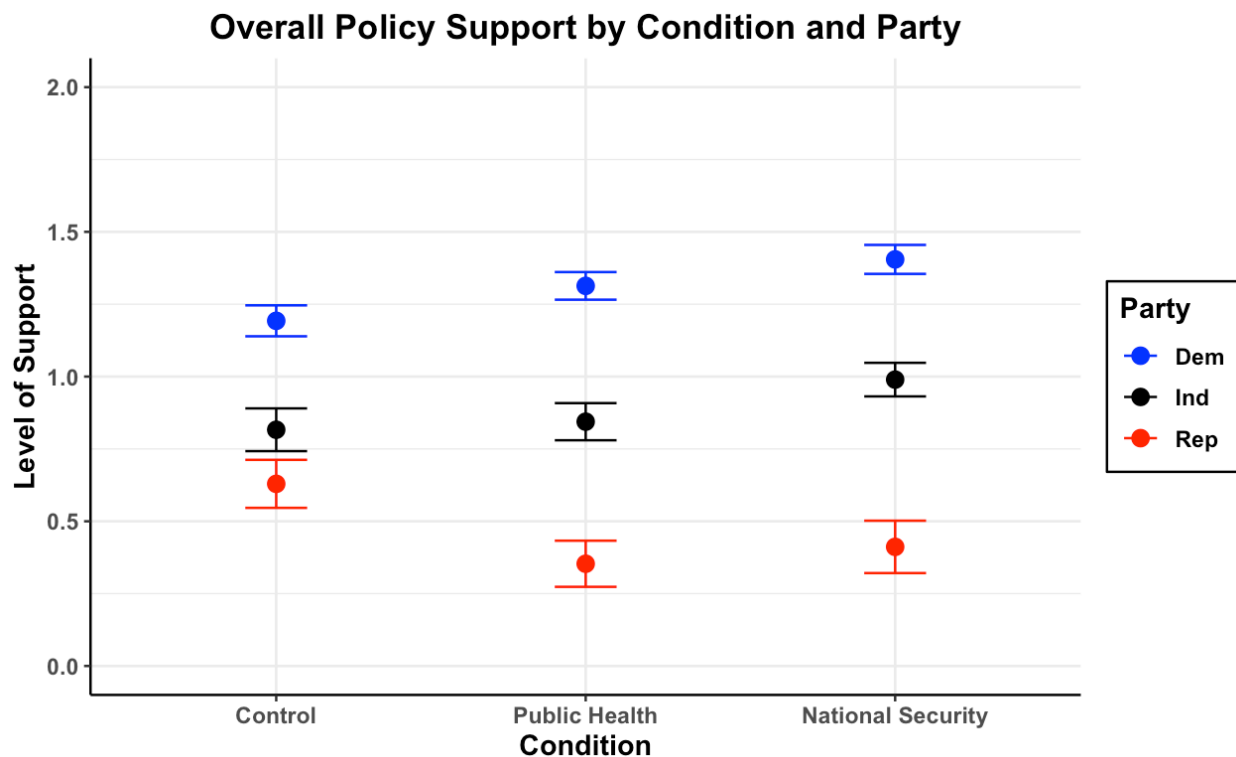**Overall Policy Support by Condition and Party**

Fig. 1 -- Mean policy support by condition and party, ± 1 SE. Policy support was measured on a scale of -2 (strongly oppose) to +2 (strongly support). Each dot represents that average score for respondents that identify as the party corresponding to the color, in that condition group. It is important to note that each condition group is independent of the other two; the graph does not represent a "pre-post" test.

Independents exposed to the national security frame possess significantly different scores than Independents in both the control and public health conditions. The difference in mean policy support scores for Independents in the control and public health conditions is not statistically significant. The difference between Independents in the control and national security

conditions (+0.17, p = 0.066) is only slightly larger than the difference between Independents in the public health and national security groups (+0.15, p = 0.094).

Unlike both Democrats and Independents, the framed articles resulted in suppressed policy support scores for Republicans compared to the control condition. Just as the differences between mean scores for Democrats in the control and treatment conditions were the largest *positive* differences, the differences between Republicans in the control and treatment were the largest *negative* differences. Republicans in the public health condition reported a 0.28-lower policy support score (p = 0.017) than Republicans in the control condition, the largest difference—positive *or* negative—between any other condition and party pairing.

This suggests that the public health frame was more negatively persuasive than the national security frame, as the difference between Republicans in the control and national security condition was only -0.22 (p = 0.077). Like Democrats, there is not a statistically significant difference in mean policy support scores for Republicans in the two experimental conditions. **Tables A7-A12** in the **Appendix** display the full results of the nine *t*-tests comparing risk perception scores by condition and party. **Figure A1** in the **Appendix** displays the policy support mean scores for each of the nine policy prompts by condition and party.

6.4. Results for Risk Perception

The risk perception scores displayed in **Figure 2** follow select patterns as the policy support scores displayed in **Figure 1**. The public health frame (compared to control) was the most positively persuasive for Democrats (+0.14, $p = 0.056$), and the most negatively persuasive for Republicans (-0.20, $p = 0.097$). Democrats in the national security condition (+0.16, $p = 0.038$) have significantly higher risk perception scores than Democrats in the control condition. Like policy support, Democrats in the two experimental conditions do not have significantly different risk perception scores.
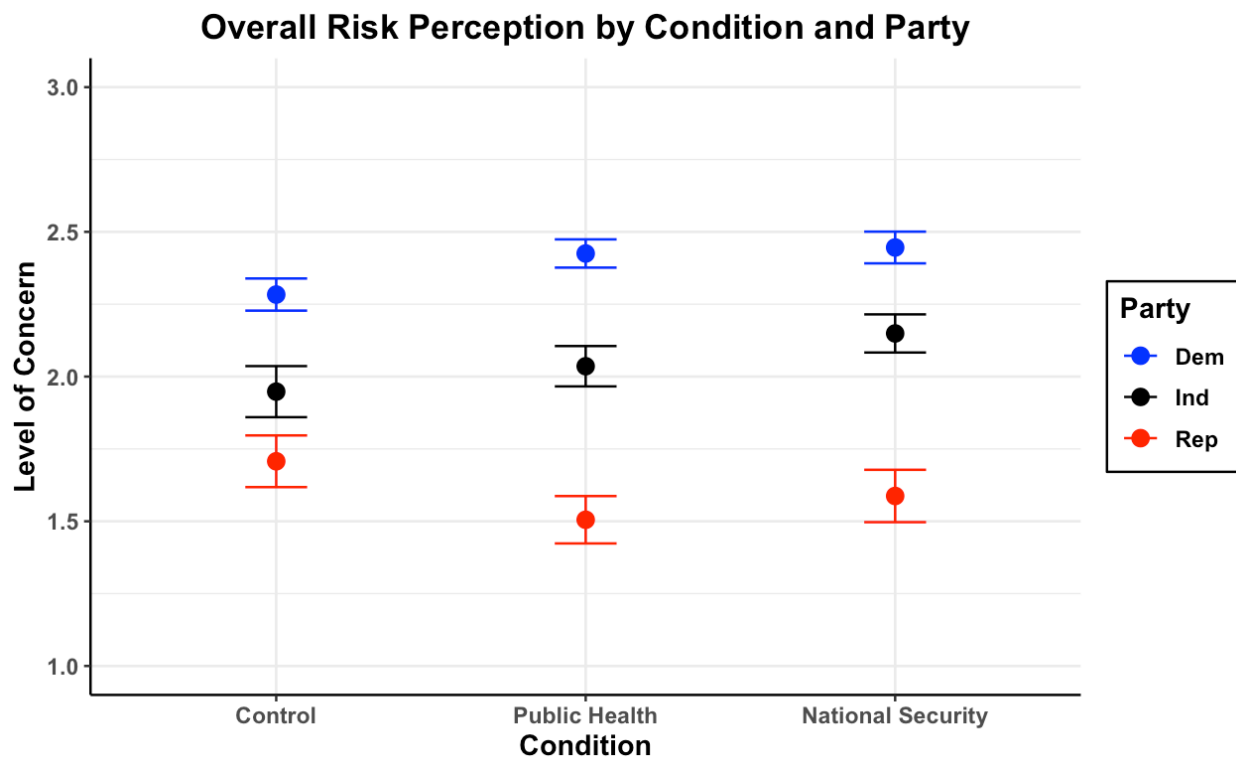
Overall Risk Perception by Condition and Party

Fig. 2 -- *Mean risk perception by condition and party, ± 1 SE. Risk perception was measured on a scale of 0 (not concerned) to 3 (very concerned). Each dot represents that average score for respondents that identify as the party corresponding to the color, in that condition group.*

The differences between levels of perceived risk and levels of policy support are more noteworthy than the similarities between the measures, however. Independents exposed to the national security frame have significantly higher levels of risk perception than those in the control condition (+0.20, $p = 0.069$), but, unlike policy support, that is the only statistically significant risk perception relationship across conditions for Independents. Therefore, only the national security frame had a framing effect for Independents.

Like Independents, only one experimental condition has a framing effect on risk perception for Republicans. The difference between Republicans in the control and public health conditions is significant (-0.20, $p = 0.097$), meaning the national security condition had no

framing effect on levels of perceived risk for Republicans. Interestingly, the national security frame is associated with nearly the same *heightened* level of risk perception for Independents (+0.2011) as the public health frame is associated with *lowered* levels of risk perception for Republicans (-0.2020). **Tables A10-A12** in the **Appendix** display the full results of the nine *t*-tests comparing risk perception scores by condition and party.

7. DISCUSSION (Section Word Count: 846)

7.1. Hypothesis 1

Our results indicate that in all but three specific instances, **H1**, or the presence of a framing effect for both experimental conditions, is supported. For both the policy support and risk perception scores, Independents exposed to the public health frame do not have significantly different dependent variable scores than Independents in the control condition. These results indicate that a public health framing for climate change does not have a significant effect on shifting policy support and risk perception for Independents. Similarly, Republicans exposed to the national security frame do not have a significantly different risk perception score than those in the control condition, therefore the national security frame lacks a framing effect for Republicans' level of perceived risk.

There are a variety of reasons the frames did not have an effect in these three specific situations. One explanation for the public health frame's lack of persuasive power for Independents could lie in the group's low confidence in U.S. public health officials. When asked how much confidence they have in U.S. public health officials, 44 percent of Independents (*N*=152) answered either "none" or "not too much".

7.2. Hypothesis 2

Our results do not confirm **H2**, or whether the national security frame was more persuasive for Republicans than Democrats and Independents, for risk perception. Democrats exposed to the national security frame had a 0.163-point higher risk perception score (*p* = 0.038) than Democrats in the control condition. The difference between Republicans in the same respective conditions was not statistically significant (-0.12, *p* = 0.347).

The results are more complicated for policy support. **H2**, while technically not supported for policy support, accurately predicted that the national security condition would have the largest effect on Republicans. It just didn't predict that this effect would be *negative*. The difference between mean policy support scores for Republicans in the control and national security condition (-0.218) is 0.006 points larger than the difference for Democrats (0.212).

7.3. Hypothesis 3

H3, or whether the national security frame is more positively persuasive for Republicans than Democrats and Independents compared to the public health frame, is also not confirmed. On a broad level, we cannot confirm **H3** because both frames yielded suppressed dependent variable

scores for Republicans but led to heightened scores for Democrats and Independents. More specifically, we cannot confirm **H3** because our results indicate that the public health frame has a particularly negative persuasive effect for Republicans.

The national security frame did not have a framing effect on risk perception scores for Republicans. Even if the difference in mean scores between the control and national security groups was significant, there was a larger difference for Republicans exposed to the public health frame (-0.202, $p = 0.097$). For policy support, Republicans exposed to the public health frame responded more negatively (-0.276, $p = 0.017$) than Republicans exposed to the national security frame (-0.218, $p = 0.077$).[11] Additionally, across both the policy support and risk perception measures, the national security frame outperformed the public health frame for Democrats and Independents (see **Tables A7-A12** in the **Appendix**).

7.4. Our Results in Context

This study is well situated in context of previous research. Above all, our findings reaffirm the power of political partisanship in influencing Americans' belief in the efficacy of mitigation and adaptation policies needed to combat the adverse effects of climate change (Cohen, 2003). More specifically, while our finding of decreased dependent variable scores for Republicans exposed to the security frame does not constitute a boomerang effect (Myers et al., 2012), it does function as a "backfiring" effect.[12] This could be caused by negative reactions to our linking of two issues (i.e., national security and climate change) that Republicans have drastically different levels of belief and support for and may not regularly associate with each other. Moreover, the national security frame reducing scores for Republican respondents (and increasing scores for Democrats and Independents) contrasts with McCright et al.'s (2016) findings. The inability of both frames to secure a framing effect across all condition and party pairings is in line with Attari et al. (2009) and the dependence of frames' effects on political party identification mirrors Feldman and Hart's (2018) findings.

Taken together, the rejection of **H2** and **H3** is significant departure from previous studies that espoused the persuasive power of the public health frame (Maibach et al., 2010; Myers et al., 2012; Hart & Nisbet, 2012; Nisbet, 2014). Our data on confidence in public health officials could explain this. Mirroring the low confidence levels expressed by Independents, when asked their level of confidence in U.S. public health officials, 45 percent of Republicans (N=166) asked either "none" or "not too much". For comparison, only 17 percent of Democrats (N=62) expressed the same levels of low confidence.

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[11] The difference in policy support between Republicans in the control and public health conditions is the largest absolute difference of means across both DV measures *and* every condition / party ID pairing.

[12] By backfiring, we mean the frames were associated with lowered dependent variable scores despite our expectation that they would be elicit heightened scores for groups exposed to the frames.

8.   IMPLICATIONS (Section Word Count: 418)

8.1. Implications for Future Research

The conditional support of **H1** and rejection of **H2** and **H3** raises important questions for future research and communication strategies for climate change. Despite both previous academic research (McCright et al., 2016) and public opinion data (Pew Research Center, 2018) suggesting the national security frame could be more persuasive for Republicans, both Democrats and Independents responded more positively to the security frame than Republicans. Future framing research should seek to explain why a national security frame is better than a public health frame at increasing policy support and risk perception for Democrats. Additionally, due to the public health frame's lack of a framing effect for Independents, the persuasiveness of a national security frame for Americans in the political "middle-ground" (e.g., "true" and "leaner" Independents, moderates) should be studied.

Another future study could explore the effects of selectively speaking about climate change's role in making mitigation and adaptation policies necessary. Our results indicate that Republicans respond worse to potential climate action when climate change is explicitly cited as the need for the policies. For certain individual policies, Republicans and Independents did not have significantly different levels of support when exposed to a control no-information frame but separated in levels of support when exposed to a framed article. Future research must examine whether not explicitly mentioning climate change as the *cause* for enacting mitigation and adaptation policies yields higher policy support scores for Republicans.

8.2. Implications for Policymakers and Climate Communicators

Our results suggest that a national security frame could perform better than a public health frame in communications targeted at Democrats and Independents, but neither frame should be used to target Republicans. The overall poor performance of a public health frame compared to the national security frame could indicate changing trends in Americans' confidence levels in public health officials because of the COVID-19 pandemic.

8.3. Limitations

While our survey relies on a non-representative convenience sample gathered through Qualtrics panel, previous research (Zack et al., 2019; Boas et al., 2020) indicates that our usage of demographic quotas (see Section 4) can ensure external validity. We also acknowledge that this study joins the heavy majority of climate framing literature based on American-only online samples (Badullovich et al. 2020), which limits our ability to extend conclusions to international contexts. In recognition of this limitation, it is worth reiterating that the focus of this project was understanding the effects of a security and health frame specifically in the unique context of issue and party polarization in the U.S.

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APPENDIX

Table A1: Respondent percent distribution for political party, gender, and region (by U.S. Census Bureau)

Political Party	%	Gender	%	Region	%
Democrat	33.6 %	Male	45.5 %	West	27.1 %
Independent	32.1 %	Female	54.4 %	Midwest	21.6 %
Republican	34.3 %	Other	0.1 %	South	38.1 %
				Northeast	13.1 %

Table A2: Respondent percent distribution for education and income

Education	%	Income	%
Some high school	2.4 %	Less than $25,000	21.6 %
HS diploma / GED	24.6 %	$25,001 - $50,000	30.6 %
Some college	31.8 %	$50,001 - $75,000	22.9 %
College degree	29.0 %	$75,001 - $100,000	12.4 %
Some graduate school	2.5 %	$100,001 - $125,000	5.1 %
Graduate degree	9.7 %	More than $125,000	7.4 %

Table A3: Percentage of respondents for political ideology by political party identification. Percentages indicate the distribution of respondents who belong to ideological group within each party group (e.g., "very liberal" Democrats represent 20.1% of the sample's Democrats, not 20.1% of the total sample.)

	Democrat	Independent	Republican
Very liberal	20.1 %	4.9 %	3.5 %
Liberal	30.0 %	7.5 %	1.1 %
Slightly liberal	14.1 %	11.5 %	1.6 %
Moderate	28.7 %	61.4 %	21.6 %
Slightly conservative	2.2 %	7.5 %	20.8 %
Conservative	2.8 %	4.9 %	26.0 %
Very conservative	2.2 %	2.3 %	25.4 %

Table A4: Number of respondents in condition by political party identification

Political Party Identification	Condition		
	Control	Public Health	National Security
Democrat	120	128	115
Independent	107	124	116
Republican	122	123	125

Table A5: Mean scores for each individual policy, by political party identification. Policy support was measured on a -2 (strongly oppose) to 2 (strongly support) scale. Standard errors are indicated in parentheses.

Individual Policies	Democrat	Independent	Republican
General (No) Theme			
Planting forests for carbon capture	1.47	1.29	1.01
	(0.04)	(0.04)	(0.05)
Providing funds for managed retreat	1.23	0.81	0.38
	(0.05)	(0.05)	(0.06)
Transition U.S. to carbon free power	1.32	0.76	0.02
	(0.04)	(0.06)	(0.07)
Public Health			
Create organization to track climate-related diseases	1.36	0.87	0.47
	(0.04)	(0.06)	(0.06)
Establish a national zero emissions public trans. standard	1.44	0.88	0.37
	(0.04)	(0.05)	(0.07)
Build publicly accessible cooling centers across the U.S.	1.32	0.94	0.47
	(0.04)	(0.05)	(0.06)
National Security			
Shift the operational energy mix of the U.S. military	1.32	0.84	0.20
	(0.05)	(0.05)	(0.07)
Construct resilient infrastructure at U.S. military bases	1.20	0.78	0.62
	(0.05)	(0.05)	(0.06)
Relocate U.S. military from flood prone areas	1.07	0.78	0.65
	(0.05)	(0.05)	(0.06)

Table A6: Mean risk perception group scores by political party identification. Risk perception was measured on a 0 (not at all), 1 (only a little), 2 (a moderate amount) to 3 (a great deal) scale.

Risk Perception Scores	Democrat	Independent	Republican
Personal	2.16	1.75	1.35
	(0.04)	(0.05)	(0.06)
Family	2.23	1.82	1.41
	(0.04)	(0.05)	(0.06)
Community	2.15	1.80	1.38
	(0.04)	(0.05)	(0.06)
Living in U.S. (currently)	2.42	2.03	1.57
	(0.04)	(0.05)	(0.06)
Living outside U.S. (currently)	2.44	2.14	1.66
	(0.04)	(0.05)	(0.06)
Living in U.S. risk (future)	2.62	2.37	1.90
	(0.03)	(0.05)	(0.06)
Living across the globe (future)	2.68	2.41	1.94
	(0.03)	(0.05)	(0.06)

Tables A7-A9: *t*-tests, Overall Policy Support, by Party ID and Condition

Democrats (Condition, x, y)	df	*t*	*p* value	Difference in means (y - x)
Control – Public Health	240.89	-1.69	0.093	0.121
Control – National Security	232.54	-2.90	0.004	0.212
Public Health — National Security	238.55	1.32	0.187	0.091

Independents (Condition, x, y)	df	*t*	*p* value	Difference in means (y - x)
Control – Public Health	219.05	-0.03	0.776	0.028
Control – National Security	205.11	-1.85	0.066	0.173
Public Health – National Security	236.88	1.68	0.094	0.145

Republicans (Condition, x, y)	df	*t*	*p* value	Difference in means (y - x)
Control – Public Health	242.51	2.40	0.017	-0.276
Control – National Security	243.65	1.77	0.077	-0.218
Public Health – National Security	242.58	0.48	0.629	0.058

Tables A10-A12: *t*-tests, Overall Risk Perception, by Party ID and Condition

Democrats (Condition, x, y)	df	t	p value	Difference in means (y - x)
Control – Public Health	239.88	-1.919	0.056	0.142
Control – National Security	232.98	-2.086	0.038	0.163
Public Health – National Security	234.32	0.283	0.778	0.021

Independents (Condition, x, y)	df	t	p value	Difference in means (y - x)
Control – Public Health	209.18	-0.781	0.436	0.088
Control – National Security	199.75	-1.827	0.069	0.201
Public Health – National Security	237.88	1.183	0.238	0.113

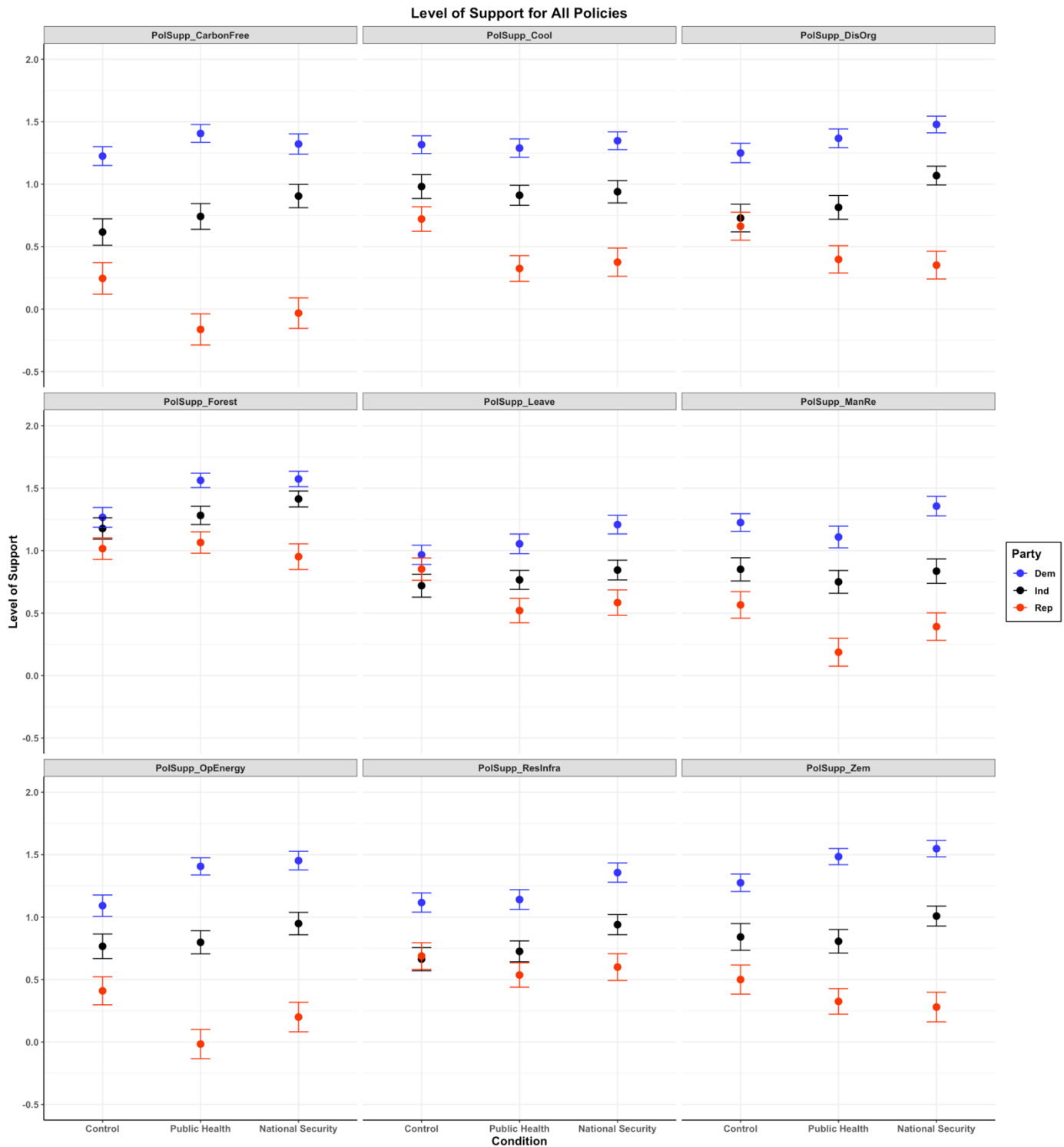| Republicans (Condition, x, y)	df	t	p value	Difference in means (y - x)
Control – Public Health	240.97	1.668	0.097	-0.202
Control – National Security	245	0.943	0.347	-0.120
Public Health – National Security	243.9	0.674	0.501	0.082

Figure A1: Support for all nine policies by Condition and Political Party Identification

Fig A1 *Mean policy support scores for all nine policies, broken down by condition and political party identification, ±1 SE. Policy support was measured on a scale of -2 (strongly oppose) to +2 (strongly support).*