How Psychological Distance shapes Americans' Climate Change Preferences: a Conjoint Analysis *

Wei Wang[†] Jing Ling Tan[‡] Wei-Ting Tsai[§]

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Abstract

How does the psychological distance of natural disasters influence climate attitudes? Existing work that apply construal level theory (CLT) to study climate perceptions report mixed effects. We argue that prior experimental evidence mostly do not test distance dimensions independently despite it being a multidimensional theory comprising social, spatial, temporal, and probabilistic distance. We contribute a systematic test of the effects of psychological distance on climate attitudes by independently manipulating each distance dimension via a conjoint experiment about disasters. From our sample of 700 Republicans, we find that more severe and socially proximate natural disasters that affect one's ingroup consistently increase pro-climate attitudes. However, spatial, temporal, and probabilistic distance generally do not have a significant effect. We find that psychological distance dimensions can exert independent effects on climate attitudes. In the case of Republicans, social proximity matters – highlighting the impacts of climate on social ingroups can warm up Republicans' attitudes on climate change by $2-5$ percentage points. Our study speaks to CLT by showing its multidimensionality and the out-sized role of social distance in polarized contexts.

Keywords: Political Psychology, Climate Change, Construal Level Theory, Polarization, Public Opinion, Survey Experiments, Social Identity, Republicans

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[†]University of Wisconsin-Madison, Email: wei.wang3@wisc.edu
[‡]Ph.D. Student, Harvard University, Email: jingling_tan@g.harvard.edu
[§]National Cheng Kung University, Email: u16124014@gs.ncku.edu.tw

1 Introduction

The frequency and intensity of climate change-induced extreme weather events continue to worsen (IPCC, 2023), yet there remains insufficient public pressure for government action in the U.S. A promising and intuitive solution for stimulating pro-climate attitudes and behavior is to make the consequences of climate change appear more psychologically proximal, based on the assumption that most people assume the effects of climate change to arrive far in the future or at distant locations. Much recent psychology and communication research have thus considered the psychological distance of climate change as an entry point to understanding psychological barriers for climate action (McDonald et al., 2015), assuming that if climate change is construed abstractly, people tend not to feel the urgency to act that is associated with more detailed and concrete mental construals (Trope & Liberman, 2010).

However, mixed findings have raised questions on whether psychological distance is a helpful theoretical model for explaining individuals' perceptions of climate change and natural disasters (Brügger, 2020; Devine-Wright, 2013) and whether proximal psychological distance increases climate action (van Valkengoed et al., 2023). Empirically, many experimental research failed to find significant main effects of reducing the psychological distance of climate change (van Valkengoed et al., 2023). Theoretically, abstract construals associated with psychologically distant events can sometimes encourage, rather than discourage, climate action when they activate people's core values and beliefs, such as when victims of climate change in developing countries evoke more pro-climate attitudes than more proximal victims for people who care about the wellbeing of others (Corner et al., 2014; Spence et al., 2012). These critiques motivated some calls for researchers, policymakers, and climate change communicators to move away from psychological distance as a theoretical model for understanding perceptions of climate change effects (Brügger, 2020; van Valkengoed et al., 2023).

The critiques summarized above indicate that particular manipulations of psychological distance may not significantly affect, or may even reduce pro-climate attitudes. However, we argue that this calls for more research to understand the effects of different components of psychological distance on climate attitudes rather than abandoning psychological distance as a theoretical framework altogether. The gap in existing empirical evidence, though, is a lack of experimental research independently manipulating each of the four psychological distance dimensions of spatial, temporal, social, and probabilistic distance (Trope & Liberman, 2010). Thus, our research seeks to understand how psychological distance influences climate attitudes, and in particular, whether particular dimensions are more salient than others in the highly polarized context of studying Republicans' attitudes.

To answer these questions, we conduct the first systematic test of the *independent effects* of all distance dimensions on climate attitudes, to the best of our knowledge. We leverage a conjoint experimental design to estimate the independent marginal effects of the four dimensions of psychological distance on the attitudes of a particular subgroup of interest, U.S. Republicans, while controlling for the severity (or perceived risk/cost) of the issue. We motivate our sample as a hard test with real-world implications as Republicans are substantially less likely to rank climate change as a priority issue (Egan & Mullin, 2024), support climate mitigation policies (Egan & Mullin, 2017), and discuss climate change with others (Ballew et al., 2019; Leiserowitz et al., 2024) compared to Democrats.

We find that more severe and socially proximate climate issues increase pro-climate attitudes, by up to 10 percentage points. We find a notable distinction between social distance and other dimensions of psychological distance that generally do not have a significant effect. Our findings speak to the importance of disentangling distance dimensions in CLT and shows one empirical example of how to do so via a conjoint design. We also show that social distance is most salient in the highly polarized context of American climate politics, with practical implications for climate communicators seeking to shift Republicans' attitudes.

The paper proceeds with an introduction to CLT and how we operationalize it our research design. Next, motivate our hypotheses and research, describe our methods, and illustrate our results. We conclude with a discussion of potential mechanisms explaining our findings along with future extensions that we hope to receive feedback on.

1.1 Psychological distance dimensions and climate change attitudes

Construal level theory (CLT) posits that people mentally construe an event either abstractly or concretely depending on the event's perceived distance from oneself, from one's current location, and from the present time (Trope & Liberman, 2010). These perceptions of psychological distance compose of four dimensions: how far away the event is spatially, how far in the future the event occurs temporally, whether the event affects people similar to oneself, and how likely it is for the event to occur (Trope & Liberman, 2010). The four dimensions are termed spatial, temporal, social, and probabilistic [1] distance, respectively. Central to CLT is the idea that to understand a person's attitudes and behavior, we must understand what is psychologically proximal to them – i.e., what they care about the most. This principle is so powerful that Wilson (2022) argued it is the foundation of social psychology and what makes the discipline distinct from other subfields of psychology.

In the context of climate change, CLT predicts that individuals who perceive the consequences of climate change as psychologically close are more likely to construe climate-related goals in concrete rather than abstract terms. That is, they focus more on the specific means of achieving these goals rather than their broad significance (Bashir et al., 2014). This concrete construal facilitates goal-directed thinking, increases a sense of urgency, and enhances motivation to take immediate action (e.g., Duan et al., 2019; McDonald et al., 2015). Prior research has provided evidence that perceiving each of these four distance dimensions as proximate may encourage pro-climate attitudes.

Spatial distance. A long line of psychological literature has documented the effects of physical proximity on subjective evaluations. In the famous Milgram experiment (1965), for example, farther physical distance between the participant administering electric shocks and the victim led to lower levels of maximum shock administered (pp. 61-65). Since then, research on spatial discounting has documented that people tend to feel less concern for risks that are physically far away (Hannon, 1994), in part because people tend to feel less impact from social events as its immediacy, or proximity in space and time, diminishes (Latané, 1981). Research on NIMBYism, for example, shows people tend to be less concerned about hazardous waste facility constructions the farther it is from one's residence (Mitchell & Carson, 1986; Vittes et al., 1993). In a similar vein, people are less willing to help others the more physically distant others are (Kogut et al., 2018), mediated by their diminishing emotional intensity for others (Batson et al., 1997; Slovic, 2007). Extended to climate change, researchers have found people exert a spatial bias where they perceive climate impacts as primarily affecting areas that are geographically distant (Gifford et al., 2009; Singh et al., 2017), but communicating the proximity of climate change's effects led to higher climate policy support (Wiest et al., 2015) and higher levels of climate protective behavior (Loy & Spence, 2020). These findings motivate us to hypothesize that spatially proximal consequences of climate change will increase pro-climate attitudes.

Temporal distance. Another significant psychological barrier to collective climate action is the perception that the negative consequences of climate change occur far into the future, which can reduce people's motivation for climate action (Bernauer, 2013). According to discounting theory, people tend to be myopic when evaluating public policies, giving greater weight to immediate outcomes and heavily discounting those that are delayed. As a result, people are generally less supportive of policies whose benefits are realized in the distant future (Jacobs & Matthews, 2012; Sparkman et al., 2021). This temporal bias poses a major challenge for climate mitigation efforts. Effective climate policies typically require substantial short-term investments in exchange for benefits that materialize decades later. Consequently, climate mitigation policies are less likely to be prioritized by the public or policymakers, despite their long-term necessity (Bernauer, 2013). Building on this literature, we hypothesize that temporally proximal consequences of climate change will increase pro-climate attitudes.

Probabilistic distance. Uncertainty about climate change consequences represents a key psychological barrier to engagement. As Gifford (2011) argues, perceived uncertainty often serves as a justification for inaction. From the perspective of discounting theory, individuals devalue outcomes

[1] In prior psychological distance literature, both "hypothetical distance" (e.g., Keane et al., 2025; Trope & Liberman, 2010) and "probabilistic distance" (e.g., Maglio et al., 2013) have been used to describe this distance dimension, although the former was more commonly used than the other. In the context of the current study, we use the term "probabilistic distance" to clarify our experimental manipulation of this dimension alters not whether or not an event occurs (a binary variable), but the magnitude of the likelihood of an event occurring (a continuous variable).

that are less likely to occur, thereby reducing the subjective value of long-term environmental benefits (Green & Myerson, 2004). Given that many people perceive climate change outcomes as uncertain (Spence et al., 2012), the perceived payoff from mitigation efforts becomes heavily discounted, leading to diminished concern and behavioral disengagement. Several empirical studies support this psychological mechanism. For instance, Keane et al. (2025) demonstrated that reducing probabilistic distance can lead to reduced psychological distance across other dimensions and, in turn, elevate climate concern and willingness to act. Similarly, interventions designed to reduce perceived improbability have been shown to increase pro-environmental attitudes and behaviors (Kaplan et al., 2014; Sargisson & Schöner, 2020). In light of this evidence, we hypothesize that lower probabilistic distance of climate change will increase pro-climate attitudes (Kaplan et al., 2014).

Social distance. In the current study, we define social distance as the perceived similarity between a person and the individuals affected by an event (Jones & Rachlin, 2006; Liviatan et al., 2008; Rachlin & Jones, 2008).[2] Decision-making literature has documented a social discounting mechanism whereby individuals are willing to sacrifice more rewards for interpersonally close people, such as a friend or family member, than for interpersonally distant people, such as a mere acquaintance (Jones & Rachlin, 2006; Rachlin & Jones, 2008). Though one may assume social distance to be of particular interest for social psychologists, prior research on psychological distance's effects on climate change preferences have rarely examined its effects in isolation. Instead, experiments have generally manipulated the social and spatial distance of an event concurrently, such as when manipulating the country or the nationality of victims affected by climate change-induced extreme weather (e.g., Hart & Nisbet, 2012; Loy & Spence, 2020; Lu & Schuldt, 2015; Wiest et al., 2015), making it difficult to attribute climate change preferences to social distance alone. Nevertheless, guided by CLT and social discounting literature, we hypothesize socially proximal consequences of climate change will increase pro-climate preferences.

1.2 Disentangling psychological distance

1.2.1 The issue: Information equivalence violation in psychological distance experiments

Previous research has often manipulated psychological distance by altering how climate change impacts are described, such as where the impacts occur, when they occur, whom they affect, and how likely they are, in order to assess their influence on concern, pro-environmental behavior, and policy support. However, many of these experimental interventions violate the assumption of information equivalence, or that "two pieces of information are equivalent if they are informationally identical in all ways except for the variable of interest" (Dafoe et al., 2018, p. 519). When this assumption is violated, observed treatment effects may reflect not only the influence of the focal attribute being manipulated but also confounding shifts in participants' beliefs about other background features.

Many studies fail to consider two types of violations of the information equivalence assumption, which pose threats to the internal validity of their psychological distance manipulations. First, altering perceptions of psychological distance can inadvertently affect climate risk perception. In interviews, some participants expressed greater concern for climate impacts abroad, citing the greater vulnerability of developing countries (Halperin & Walton, 2018). In such cases, increased willingness to act may stem more from heightened risk perception than from reduced psychological distance *per se*. In other words, people may be more willing to act because they perceive developing countries as needing more help, irrespective of psychological distance. Second, reducing one dimension of psychological distance may inadvertently increase another. For example, proximate spatial distance may lead to distant hypothetical distance. Individuals tend to exhibit wishful thinking (Krizan & Windschitl, 2007, 2009; Roese & Olson, 2007; Taylor & Brown, 1988) and ascribe lower likelihood to a negative outcome when it is spatially near than distant (Hong et al., 2024). Thus, when participants are exposed to a low spatial distance climate event that does not control for hypothetical distance, they may perceive the event as less likely to occur, effectively increasing their perceived probabilistic distance (McDonald et al., 2015) and thus canceling out the attitudinal effect of proximate spatial distance.

[2]Others have theorized social distance as the distinction between the self and others, with less consideration of those similar to oneself as also socially proximate. See Pronin (2008) for this alternative conceptualization.

The above two violations of information equivalence may introduce confounding and explain many of the mixed or null findings in the literature. For instance, Manning et al. (2018) found that their Minnesotan participants who read about the impact of climate change on animals in Minnesota reported lower psychological distance and greater donation intentions than those who read about climate change impacts on people in Minnesota. Surprisingly, participants who read about people in Kenya also reported lower psychological distance and higher donation willingness than those reading about people in Minnesota. The authors suggested that suffering Kenyans may be seen as more plausible victims of climate change than suffering Minnesotans. Following our line of reasoning above, a scenario intended to reduce spatial distance by invoking local human victims may have inadvertently increased perceived probabilistic distance due to the perceived improbability of such a severe impact occurring in the U.S.

1.2.2 Our solution: Conjoint analysis using hypothetical natural disaster scenarios

Although some scholars have emphasized the need for innovative methods to disentangle the effects of different distance dimensions (Chu & Yang, 2018), most studies have not addressed this challenge directly. One possible reason lies in the theoretical framework of CLT, which posits that the four dimensions of psychological distance are interrelated, and that perceptions of distance in one dimension often co-occur with similar perceptions in other dimensions (Trope & Liberman, 2010, pp. 442-444, see also Maglio et al., 2013). Moreover, different distance dimensions usually tend to exert similar effects on construal level (Chu & Yang, 2020; Fujita et al., 2006; Spence et al., 2012). Thus, even if the intended manipulation targets only one dimension, the overall reduction in perceived distance may still produce the expected effects on concern or action. For example, Keane et al. (2025) argued that reducing probabilistic distance may also diminish other forms of psychological distance, thereby increasing concern for climate change and motivating action.

In the current study, we implement an innovative conjoint experimental design where we independently manipulate all four psychological distance dimensions. Our experimental treatment composed vignettes describing hypothetical climate change-induced natural disaster events that vary in location, time in the future, likelihood of occurrence, and identity of the victims, corresponding to the distance dimensions. We also manipulate the severity of the event as a covariate control measure. Conjoint designs are well-suited for constructs that are multi-dimensional, such as psychological distance, because they allow for the estimation of the marginal effects of each dimension, while controlling for all other dimensions at their baseline (Hainmueller et al., 2014, 2015). This approach helps us avoid the potential of confounding among dimensions and between psychological distance and risk severity.

In addition, we distinguish our design from a plurality of prior climate change psychological distance experiments that manipulated framing. Treatments in the framing approach typically emphasize certain pieces of information over others, such as highlighting the potential health impacts of climate change for American versus French farmers (Hart & Nisbet, 2012). However, such an approach is susceptible to participants' prior climate change experience or knowledge suppressing the framing treatments' effects (Druckman & Leeper, 2012). For example, participants who already knew pre-treatment that American or French farmers would face a health crisis as a result of climate change may not shift their preferences significantly after being treated. This may further contribute to null effects of psychological distance manipulations as a result of underestimated effect sizes. Our use of hypothetical natural disasters was designed to avoid such "pre-treatment effects" (Druckman & Leeper, 2012) by asking participants to imagine themselves in these fictional natural disaster events.

In all, while we are limited in having to use hypothetical scenarios, we gain causal identification and the ability to independently randomize the dimensions. We also include a suite of tests that validate our conjoint design and show that respondents are discerning in their responses despite the hypothetical nature of the design (see Results and Appendices).

1.3 Hypotheses and research question

1.3.1 Case study: U.S. Republicans

Our choice of Republicans as our population of interest is theoretical as well as practical. Theoretically, Republicans present an interesting case study given their low baseline likelihood of adopting pro-climate preferences (Ballew et al., 2019; Egan & Mullin, 2017, 2024; Leiserowitz et al., 2024) compared to other Americans. Furthermore, the conservative information environment that has long cultivated climate skeptic views (Feldman et al., 2017; McCright & Dunlap, 2003; Merkley & Stecula, 2018) and the empirical evidence suggesting high likelihood of psychological reactance to climate change messaging (Hart & Nisbet, 2012; Zhou, 2016) presents a hard case for us to stress-test the potency of psychological distance in shifting the climate preferences of a group that is particularly resistant to change on this issue. Practically, resistance from Republican voters in the U.S. presents a major barrier to political consensus on climate policy changes, and we hope to offer insights for communicating climate change consequences to this group of individuals who are also disproportionately susceptible to natural disasters (Borenstein, 2025; Egan & Mullin, 2024).

Motivated by the literature we reviewed, we preregistered the following confirmatory hypothesis:

Hypothesis 1 (H1): *Natural disasters that are a) spatially, b) temporally, c) probabilistically, and d) socially proximal (compared to distant) will increase pro-climate attitudes among Republicans.*

1.3.2 Willingness to speak out as a pro-climate outcome

We argue that in addition to pro-climate attitudes, which we have discussed extensively above, willingness to express climate change opinions with co-partisans is another key outcome of interest. Republicans rarely discuss climate change with others (Ballew et al., 2019; Leiserowitz et al., 2024), which, combined with the abundance of climate-skeptic information in conservative media, may perpetuate an ingroup norm where anti-climate voices dominate in the Republican information environment and silences pro-climate voices (Noelle-Neumann, 1974, 1993). This norm may be so strong that even though most Republicans privately support climate mitigation policies, and also correctly perceive that they hold the majority opinion, they may still be unwilling to speak out and by extension push for policy change out of a fear for social isolation (Dixon et al., 2024). Thus, encouraging more opinion expression among Republicans may bring about the desirable effect of an updated norm where the majority pro-climate policy Republicans speak out their minds, thus contributing to a "spiral of empowerment" (Lee & Chun, 2016).

Given this, we pose our second preregistered confirmatory hypothesis:

Hypothesis 2 (H2): *Natural disasters that are a) spatially, b) temporally, c) probabilistically, and d) socially proximal (compared to distant) will increase willingness to express climate policy opinions with other Republicans.*

1.3.3 Party identity as social distance

Previous literature on psychological distance's effects on climate preferences rarely consider political party membership as a form of social distance. However, political science literature is no stranger to the construct of social distance in theorizing affective polarization, or the degree to which individuals from different parties dislike each other (Iyengar et al., 2012). In fact, one of the most commonly used measures for affective polarization (Druckman & Levendusky, 2019; Iyengar et al., 2012) gauges precisely social distance by asking one's level of comfort having close friends, neighbors, and in-laws from the opposite party (Almond & Verba, 1960).

We expect that partisanship will be a much more salient form of social identity and social distance than other social identities commonly used in prior literature, such as nationality. Climate change opinion deeply polarized along partisan lines (Ballew et al., 2019; Egan & Mullin, 2017, 2024; Leiserowitz et al., 2024), so much so that climate change beliefs can be statistically reliable indicators of partisan identity in the U.S. (Hamilton et al., 2020). Whether victims of climate change-induced natural disasters are in-party or out-party members likely matter a lot for Republicans (and similarly,

for Democrats), given that people often fail to empathize with out-group members' suffering (Cikara et al., 2011; Gutsell & Inzlicht, 2012) and may even experience *schadenfreude* when negative outcomes befall out-group (Cikara et al., 2014) or out-party members (Combs et al., 2009).

However, because prior experimental work did not fully manipulate all four distance dimensions simultaneously, we do not know how social distance's effects compare with the other psychological distance dimensions. We thus do not pose a directional hypothesis, and rather preregistered the following exploratory question: How would social distance's effects compare against other psychological distance dimensions for Republicans when conceptualized as the partisan identity of natural disaster victims?

2 Materials and Methods

Our current study seeks to directly assess the independent marginal effects of each psychological distance dimension. To achieve this, we fielded a conjoint survey experiment where participants were presented with hypothetical natural disasters with randomly generated attributes. In addition to its theoretical benefit of allowing us to disentangle the marginal effects of each dimension, the conjoint design also benefits from the methodological advantage of high statistical power, given that it allows for a large amount of effective observations with a relatively small sample size of respondents (Hainmueller et al., 2014).

2.1 Sample

We fielded our survey experiment on a quota sample of 700 U.S. Republican adults recruited by Prolific between February and March 2025. Our study received exempt status for human subjects research from the [REDACTED] Institutional Review Board. Participants were quota-matched by education level and sex against the 2020 American National Election Studies dataset (American National Election Studies, 2021).[3]

2.2 Survey instrument

We manipulated five attributes of a hypothetical flood in our treatment vignettes, including the four psychological distance dimensions and flood severity. We chose floods as our natural disaster of interest because they are the most common and widespread of all weather-related natural disasters (NOAA National Severe Storms Laboratory, n.d.) and occur almost equally often across all states and regions of the U.S. (Tompkins & Watts, 2022; USGCRP, 2018). Though we do not assume all participants to perceive floods as equally likely to affect them, selecting any other natural disaster, such as tornadoes, wildfires, or heatwaves, would leave participants who live in unaffected regions to disbelieve the realism of our hypothetical scenarios, thus leading to treatment inconsistency.

Our survey proceeded as follows (see Figure 1). After indicating their consent and before being exposed to their first treatment, participants are shown a vignette describing the conclusion of U.S. Geological Survey, a nonpartisan government agency, that greenhouse gas (GHG) emissions lead to climate change, which in turn increase flood risks. We included this vignette to control for the likelihood that our participants do not attribute climate change or GHG emissions as a cause of floods. Following this, each participant received their first hypothetical flood treatment, in which they were asked to imagine themselves in the scenario described and then asked to record their responses to our outcome variables, which we introduce momentarily. The treatment was then repeated four times, with each new flood scenario's attributes randomly selected such that they are never identical to floods previously shown to the same respondent. Lastly, at the end of the survey, we recorded the participant's demographic attributes.

[3]Though other variables such as income (e.g., Bohr, 2014) and race (e.g., McCright & Dunlap, 2011; Schuldt & Pearson, 2016) have also been shown to correlate with climate opinions and susceptibility to climate change's effects, we were unfortunately constrained by Prolific's limit only two demographic pre-screeners.

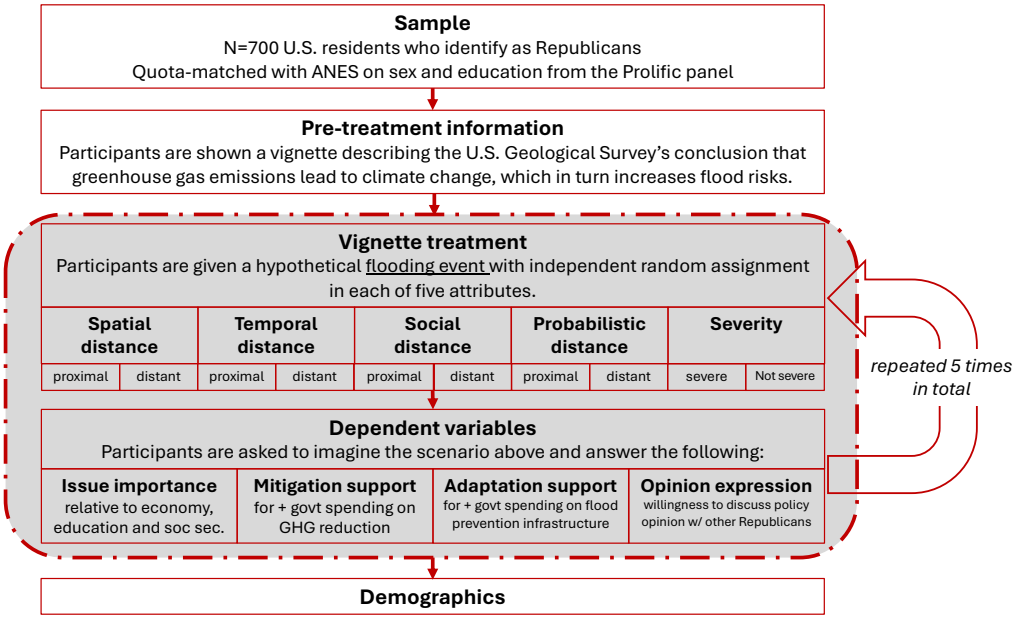


Figure 1: Consort diagram of survey design.

Attribute	**Proximate/Severe**	**Distant/Not severe (reference group)**
Spatial distance	In the county you live in and its immediate surroundings,	In a county located in a far-away state in the U.S.,
Probabilistic distance	it is extremely likely	it is slightly likely
Severity	that a flood killing around 100 residents and injuring around 100	that a flood injuring a handful of residents with no deaths
Temporal distance	will happen one year from now.	will happen one decade from now.
Social distance	The flood is expected to affect areas where many Republican voters live.	The flood is expected to affect areas where many Democratic voters live.

Example vignette:
Now, please imagine that you are in the following situation.

Flooding Event 1

In the county you live in and its immediate surroundings, it is **extremely likely** that a flood **killing around 100 residents and injuring around 100** will happen **one year from now**. The flood is expected to affect areas where **many Republican voters live**.

Figure 2: Vignette treatment design.

Given that each participant received five treatments and recorded five sets of outcome variable values, we gain an effective sample size of 3,500 when multiplied with our number of participants.

Figure 2 represents our treatment vignette design. Spatial distance is operationalized as whether the flood occurs in the participant's county or in a far-away county. In doing so, we diverge from many prior manipulations of spatial distance where the distant condition includes the proximate condition, such as comparing local against national effects (e.g., Shwom et al., 2008; Sparkman et al., 2021), which could have introduced the scale of the effect as a confounder – a natural disaster that affects an entire nation is likely much stronger than one that affects only a local area. Probabilistic distance is operationalized as the likelihood of the flood's occurrence, severity as the number of people killed and injured from the flood, and temporal distance as how many years in the future the hypothetical flood would occur. Crucially, we operationalized social distance as the partisan identity of flood victims, motivated by our discussion in Section 1.3.

Corresponding to our two confirmatory hypotheses, we record three measures of pro-climate attitudes and two measures of willingness to express climate opinions. In addition to including climate mitigation policy support (1-Strongly oppose, 7-Strongly support) as a common attitudinal measure, we included relative issue importance of climate change (1-highest priority, 4-lowest priority) as a hard test of the effects of psychological distance. In this measure, climate change was ranked against three other issues facing the country, education, social security, and the economy, each of which was ranked as more important by Republicans than climate change (Egan & Mullin, 2024). If any psychological distance dimension could significantly shift Republicans' issue importance, then, we can conclude that it exerts a strong effect on climate attitudes. Third, we also included climate adaptation policy support (1-Strongly oppose, 7-Strongly support) as a climate attitude measure, given that previous research has found it may be affected by psychological distance through different mechanisms compared to mitigation support (McDonald et al., 2015).

We measure willingness to express in two formats, face-to-face and on social media (1-Very unwilling, 7-Very willing), once again to include a strong and a weak form of the same construct, given that individuals are significantly less likely to self-silence because of a fear of social isolation when they express their opinions online than when they express them in-person (Ho & McLeod, 2008).

3 Results

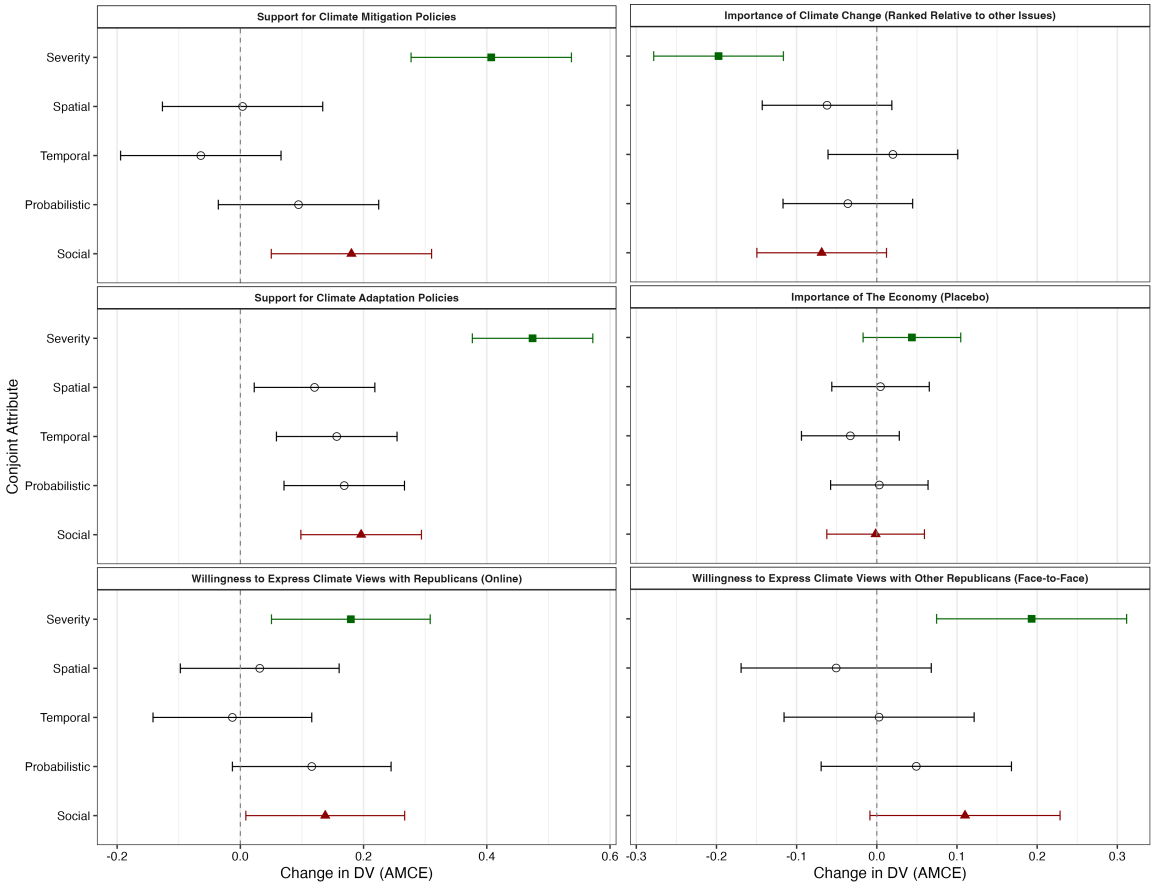
In this section, we present the experimental results in three parts. First, we explain our main findings that more severe and socially proximate climate issues increase pro-climate attitudes. Second, we discuss the observed variation in effects across psychological distance dimensions. Third, we explain our robustness check of predicted probabilities of climate preferences and other supplementary analyses.

3.1 Severity and social proximity matter

When a climate change consequence is presented as more severe – involving more casualties and injuries – this consistently induces stronger pro-climate preferences. Those with more severe climate impacts show a $3-10$ percentage point increase across our dependent variables. The effects of severity serve as a litmus test of our experimental design by replicating a well-established finding that public opinion on climate change is sensitive to costs, across a wide range of contexts (Beiser-McGrath & Bernauer, 2019; Gaikwad et al., 2020).

Turning to our psychological distance attributes, we find that the dimension with the most salient and consistent effects is social distance. When a climate change consequence is presented as socially proximate – affecting areas where many partisan in-groups live (Republicans) as compared to areas many Democrats live – pro-climate preferences consistently increase. To formally quantify our treatment effects, we use the standard quantity of interest employed in conjoint experiments – the average marginal component effect (AMCE) (Hainmueller et al., 2014). Since we use a Likert scale for most of our outcome measures, the point estimates further to the right of our AMCE x-axis indicate a greater raw value on our scale. For example, this means that a higher AMCE means a respondent shows higher support for climate mitigation policies or higher willingness to express their

climate views with other Republicans. We retain the original scales for our AMCE instead of rescaling to a probability distribution given that one DV, issue importance, is a relative ranking of four issues where 1 means the issue is ranked highest and 4 lowest.[4] Thus, for our outcome measure of issue importance, a negative AMCE means a respondent is likely to rank the issue as more important.



(a) AMCEs are positive and statistically significant for more severe issues (in green) and for socially proximal issues (in red). of reducing social distance. DVs in this column are on a 7-point scale.

(b) Consistent directional effects of reducing social distance on issue importance of climate (4-point scale) and expression (7-point scale). (Top): for issue importance, a negative AMCE means the issue is ranked as more important.

Figure 3: More Severe and Socially Proximate climate issues have consistently positive AMCEs

The left panel of Figure 3 shows the AMCEs for three DVs - climate mitigation policy support, adaptation policy support, and willingness to express climate views online. First, we discuss the findings for the "more severe" treatment (in green) and the "more socially proximate" condition (in red). Across all three DVs on the right panel, we find that the AMCEs for severity and social proximity are positive and statistically significant at the 95% confidence level.

Next, the right panel of Figure 3 shows the AMCEs for three other DVs - relative importance of climate change, relative importance of the economy (a placebo outcome), and willingness to express climate views online. As mentioned, the AMCEs for issue importance should be interpreted inversely where negative effects denote increase climate attitudes. Here, we find consistent directional effects that more severe and socially proximate climate issues increase climate attitudes. However, the size of the effect is small relative to the left-hand panel and only significant at the 90% confidence level for

[4]We find similar results after we rescale our outcomes into a probability scale, as seen in Figure 4.

the social proximity treatment. Our placebo issue importance measure for the economy (left middle panel) shows null effects, which reassures us of our design and response quality.

3.2 Variation across psychological distance dimensions

While we consistently find positive effects of social proximity on all dependent variables, with significance at the 95% or 90% confidence level, we find largely null effects for the temporal, spatial, and probabilistic dimensions of psychological distance.[5]

Our finding of null effects for other psychological distance dimensions, while contrary to our hypotheses, is unsurprising. As discussed in our literature review, existing experimental work on psychological distance have mixed findings that depend on the exact dimension being tested, how it is operationalized, and the context under which it is tested. We add to this large body of literature in finding differential effects of psychological distance depending on the dimension being tested. Unlike most existing work, however, our conjoint experiment has allowed us to independently manipulate each dimension. We therefore underscore the point that the effects of psychological distance can vary by dimensions and needs to be carefully decomposed. We offer one empirical example of how to decompose psychological distance via a conjoint design. In doing so, we find that social distance in particular is most salient in the context of Republicans' climate attitudes.

3.3 Robustness check - Predicted probabilities of climate preferences

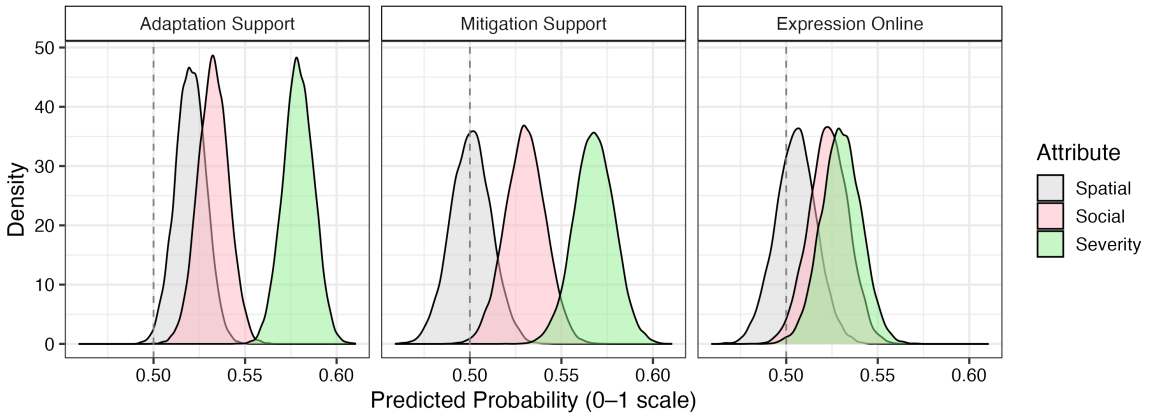
To assess the robustness and uncertainty of our findings, we follow established practice in conjoint analysis for variance estimation (Hainmueller et al., 2014). We use bootstrapping, where respondents are resampled with replacement and uncertainty estimates to generate predicted probability distributions from the standardized AMCEs. This may produce estimates with better small-sample properties than using cluster-robust standard errors. To standardize AMCEs across different outcome measures, we compute a conversion factor dividing the original Likert value by its range (max-min value), such that it is bounded $\in [0, 1]$. For each observation in our dataset, we simulated 10,000 draws from a normal distribution parameterized by the AMCE estimate and its standard error.

Next, we filtered the bootstrapped data to focus on three dependent variables—Adaptation Support, Mitigation Support, and Expression Online—and three conjoint attributes of interest (Spatial, Social, and Severity). The DVs presented are those with statistically significant results in Figure 3(a), to test their robustness; this also explains our selection of severity and social attributes. We chose to only present spatial distance among the other attributes for illustrative clarity and to highlight the distinction between spatial and social distance, which are commonly bundled in existing studies.

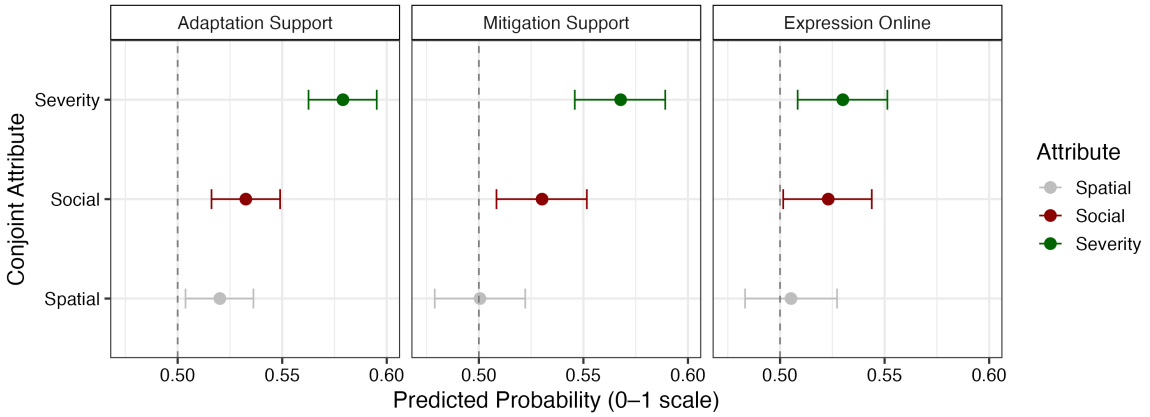
What do we find from our predicted probabilities? As seen in Figure 4a, the predicted probability distribution of the treatment group has a distinct rightward shift compared to the baseline of 0.50[6] – for the social and severity treatments. In other words, over repeated sampling, climate issues that are more severe (green) and more socially proximate (pink) have consistently higher policy support (left and middle graphs in 4a). For online expression, there is still a visible rightward shift but of lower magnitude (4a, right). Overall, when a climate issue is more severe or socially proximate, the predicted probability distribution is consistently more positive across the three DVs.

[5]The notable exception is climate adaptation which has surprisingly higher baselines and AMCEs than all our other outcomes. We postulate that this is due to climate adaptation being less recognized as a partisan issue and more direct in addressing the flooding issue at hand; whereas climate mitigation has been strongly ingrained as a partisan issue in U.S. climate politics and likely more resistant to any treatment effects. We plan to field a follow-up study and welcome suggestions on how to empirically test this intriguing finding.

[6]In future work, we will test alternative baselines. We welcome suggestions on how to compute the baseline empirically for a conjoint.



(a) Bootstrapped Predicted Probability Density.



(b) Predicted Probabilities with Bootstrapped 95% Confidence Intervals.

Figure 4: More Severe and Socially Proximate climate issues have significantly higher predicted levels of policy support and online expression among Republicans.

To quantify this shift, Figure 4b shows the point plot of the predicted probabilities of our bootstrap. We assume that the baseline predicted probability is 0.50. Again, we find support on our main findings that severity and social proximity have a positive and significant effect across all DVs.

On the other hand, for the spatial distance dimension, we only observe a positive effect for adaptation support and do not see a distinct rightward shift in distribution for the other two DVs. We find largely null findings as well for the other psychological distance dimensions of time and probability. Indeed, social distance appears to stand out as the most consistent predictor and driver of pro-climate attitudes among Republicans. Our probability distribution plot also underscores the distinctiveness of the spatial and social dimensions under certain outcomes. We thus show that by independently randomizing each psychological distance dimension, we can gain more nuanced insights into the explanatory power of each dimension under different contexts.

We have also conducted various other robustness checks and probes including using the Benjamini-Hochberg procedure for multiple hypotheses testing, converting our Likert scales to binary outcomes, and ensuring that the vignette order does not affect our outcomes. Additionally, we conducted an exploratory text analysis using a structural topic model to analyze our open-ended responses on what respondents would like to share with other Republicans on the issue. We find three topic categories: climate science and beliefs; hot cognition, encompassing emotions, beliefs, and personal experiences about the issue; and cold cognition, emphasizing material considerations on the issue (see Appendix

3 for details). However, we observe that the topics from the unsupervised bag-of-words classification are not very clearly defined. In future work (Section 4.4), we may solicit more open-ended responses from a follow-up study and utilize other text classification techniques such as large language models.

4 Discussion

In this paper, we show that social distance is a key driver in increasing Republicans' climate preferences. Our theory speaks to theories on psychological distance but adds a nuanced understanding of why some distances go further than others in explaining climate attitudes. We consistently find that reducing the social distance of climate change has a positive and significant effect on climate attitudes among Republicans. When framing climate change as a socially proximal issue that mainly affects Republicans (as compared to Democrats), we see a $2-5$ percentage point increase in pro-climate preferences. This positive effect is robust across a broad set of climate attitude measures - mitigation policy support, adaptation policy support, personal issue importance, and willingness to express their opinions - and across model specifications. In contrast, we find inconclusive results from other dimensions of psychological distance (temporal, probabilistic, spatial) in line with van Valkengoed et al.'s (2023) review.

4.1 Why social distance matters more than other distances for Republicans

Our finding that social distance exerts the strongest influence among the four distance dimensions is consistent with the motivated reasoning framework (Hart & Nisbet, 2012), which suggests that individuals selectively process information in ways that reinforce their political identities. In our study, social distance was operationalized as the partisanship of the climate change victims. As partisanship serves as a salient identity marker in the current polarized political environment, it likely became a dominant cue during participants' judgment formation. Byrne and Hart (2009) proposed that individuals engage in competitive processing of message components, and cues that align with pre-existing beliefs are more likely to be activated. This helps explain why cues related to social identity, such as whether the victim shares the same political affiliation, might overshadow other dimensions like geography or time. In fact, we find that Republicans who strongly identify with the party have larger conditional AMCEs for our social proximity treatment than Republicans with weak or moderate partisan identity (see supplementary analyses in Appendix 2 for details).

In addition to identity-based reasoning, emotional mechanisms may also help explain why social distance produced a stronger effect than other dimensions. Compared to spatial, temporal, or probabilistic cues, partisanship may elicit stronger affective reactions, such as empathy, compassion, or threat, due to the deeply emotional nature of political identity (Holliday et al., 2024; Iyengar et al., 2012). Brügger et al. (2015) argued that emotional concern is a key mediator that links proximity to engagement, and that the effectiveness of proximity cues depends on whether the targeted object holds emotional or symbolic significance. In the American context, political affiliation may evoke stronger affective responses than geographic closeness. Lu et al. (2016) provided further evidence, showing that compassion toward climate victims significantly increases support for mitigation policies. Importantly, this emotional reaction is intensified when victims are perceived as socially similar to the respondent, suggesting that social closeness amplifies empathic concern.

A further potential explanation for why social distance matters for Republicans in particular lies in literature around moral foundations and moral reframing theory (Feinberg & Willer, 2019; Haidt & Joseph, 2004). According to the moral foundations theory (MCT) (Haidt, 2007), political liberals and conservatives hold different moral intuitions, with one of the differences being that conservatives value ingroup solidarity significantly more than liberals. To investigate whether social distance exerts a weaker effect among Democrats or liberals, as predicted by MCT, requires additional research with a broader sample beyond the scope of the current study design. However, our findings support the notion that for Republicans, devising communication strategies that emphasize the disproportionate climate change susceptibility of fellow Republicans (Borenstein, 2025) may be more effective than emphasizing higher risks for all people in general. Together, these insights highlight the importance of integrating emotional, identity-based, and value-based processes when designing climate messages that seek to

reduce psychological distance.

4.2 Why disaster severity matters

While our study was designed to isolate the effects of psychological distance by controlling for risk perception, our results indicate that perceived severity of climate impacts had the most consistent and robust effect across outcome variables. Previous research has shown that perceived risk and psychological distance are conceptually and empirically intertwined (Spence & Pidgeon, 2010). Manipulations of psychological distance, particularly in terms of spatial or social distance, can unintentionally alter perceptions of vulnerability, thereby affecting risk perception (Halperin & Walton, 2018). To address this, we included severity as a controlled attribute in our experimental design, aiming to reduce the possibility that risk perception would confound the estimated effects of psychological distance. Although perceived severity emerged as a powerful predictor—highlighting the central role of risk perception in motivating climate engagement—this does not diminish the relevance of psychological distance. In fact, our results show that social distance continued to exert a significant effect even when severity was held constant. This suggests that social proximity can independently mobilize pro-climate preferences, potentially through activating strong identity-based emotions such as empathy or solidarity (Lu & Schuldt, 2016).

4.3 Explaining heterogeneity across different climate preferences

Our findings reveal a nuanced pattern regarding the impact of reduced psychological distance on climate engagement. While social proximity increased participants' support for both mitigation and adaptation policies, as well as their willingness to express views online, its effects on perceptions of issue importance was only marginally significant at the 90% confidence level, and it did not significantly affect willingness to engage in face-to-face discussion. This pattern may be understood through the lens of CLT and the nature of the outcomes being measured.

First, according to CLT, reduced psychological distance fosters lower-level, concrete mental construals (Trope & Liberman, 2010), which in turn promote goal-directed thinking and action-oriented responses. Policy instruments such as government spending on flood infrastructure or greenhouse gas reduction are inherently concrete and instrumental, aligning well with the action-oriented mindset elicited by psychological proximity. Indeed, prior research has found that environmental policies that directly address natural disasters receive higher support than policies that only abstractly address environmental quality (Sparkman et al., 2021). In contrast, perceived issue importance is an abstract, evaluative construct tied more closely to core values or worldviews, and therefore less susceptible to experimental manipulations of proximity (Brügger et al., 2015).

Second, as we expected, willingness to engage in face-to-face political discussions was harder to shift than willingness to express online. Offline political discussions are often seen as socially risky or emotionally taxing, invoking fear of ostracism. In contrast, online expression offers a lower-cost, lower-risk outlet (Ho & McLeod, 2008). Supporting government spending or posting online does not require personal confrontation, whereas face-to-face advocacy may feel more costly and emotionally exposing.

Taken together, these results suggest that social proximity can generally induce pro-climate preferences, but its effects are contingent on the nature of the attitudinal or behavioral outcome. Proximity may not be sufficient to shift deeply held attitudes or prompt socially costly behaviors.

4.4 Future work and feedback

We note that this is work-in-progress and especially welcome feedback on how to best validate and extend our current findings. We suggest three ways to do so, to reinforce both the external and internal validity of our results.

First, we propose to validate our findings by mapping our vignettes to real-world natural disaster events and how they are reported in the media. Following prior work (Huff & Kertzer, 2018), we plan to use content analysis to code articles on disaster events by their severity and social distance. We can

then apply our predicted probability estimates to assess how the perceived social distance and severity of these disasters could correlate with outcomes like sentiments towards these issues. In doing so, we hope to address a common critique of experimental methods lacking external validity, particularly since we used a hypothetical scenario (see Hainmueller et al., 2015, 's findings on single conjoint and single vignette experiments).

Second, we plan to field a follow-up study to test our discussed mechanisms and address heterogeneity we found across different climate preferences. To test our mechanisms, we could include mediating questions on emotions and moral attitudes. We could also validate our suspicion that the question wording of "climate change" may have diverged responses in our current study on climate mitigation (which includes the term) and adaptation (which does not). Next, our follow-up can also compare between different operationalizations of social distance, using other identities such as urban/rural identity (Walsh, 2012) and race (Berberian et al., 2022). As discussed in our results, we are also exploring how to elicit and analyze our open-ended text responses to understand our respondents' sentiments.

Lastly, we hope to clarify the scope conditions of our findings and to what samples they are likely to apply to beyond Republicans. Given that social identity and distance can be highly contextual, we are considering fielding our follow-up on a different sample - either on a full nationally representative US sample, or in another context where climate change is polarized.

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