Measuring Americans' support for adapting to 'climate change' or 'extreme weather'

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Abstract

Climate communicators can use the terms 'climate change' or 'extreme weather' to describe climate change adaptation strategies. However, the terms might differentially affect individuals' support for those strategies. We examined Americans' ($N = 1,558$) endorsement of climate change adaptation behaviors and policies based on whether they were described using 'climate change' or 'extreme weather.' Republicans' endorsement of some adaptation behaviors and policies was lower when using the term 'climate change' compared with 'extreme weather,' while in contrast, Democrats' reported willingness to engage in collective adaptation behaviors and support for policies related to protecting natural spaces was higher when using the term 'climate change.' The appropriateness of using 'climate change' or 'extreme weather' is situational depending on both the audience and the behaviors and policies being communicated.

Keywords: Climate change; adaptation; behavior; policy support; extreme weather

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Climate change is an urgent social and environmental problem, and its impacts are becoming increasingly apparent. As a result, *adaptation* is growing in importance as a strategy for addressing climate change impacts. Climate change adaptation refers to activities that help people and ecosystems prepare for and respond to climate change impacts, with the goal of reducing harm or taking advantage of beneficial opportunities from those impacts (IPCC, 2021). Adaptation must occur, and is occurring, at every scale of human society, from international coalitions to individuals and households (Adger et al., 2005; Grothmann & Patt, 2005; IPCC, 2014). As a result, adaptation has emerged as its own topic in public communication regarding climate change (Moser, 2017).

One issue in communicating about adaptation is that communicators can easily avoid the topic of climate change itself in favor of discussing specific impacts (Koslov, 2019; Kuh, 2015). Climate change impacts often take the form of extreme weather events such as heat waves, floods, fires, and hurricanes, which can have devastating harms for people and communities (IPCC, 2021, 2021). These events have been made worse by climate change (IPCC, 2021; Trenberth, 2012), but nonetheless people do not always connect these extreme weather impacts to climate change (Howe et al., 2014; Marlon et al., 2021; Ogunbode et al., 2019).

In the United States, avoiding the term 'climate change' may be necessary in some cases to maintain audience engagement. In particular, Republicans and political conservatives may reject messages linking an issue to climate change, even if they might otherwise agree with the message (Hart & Feldman, 2018; Petrovic et al., 2014). This becomes a particular problem in the case of extreme weather events because individuals' responses to these events, such as using an emergency kit or evacuating, are a critically important part of disaster response (e.g., Hamilton et al., 2020). However, it is not known whether using the term 'climate change' to describe an event might affect Republicans' behaviors when responding to that event. If it does, then it may be important for messages to focus on immediate life-saving behaviors, even at the expense of connecting those events to climate change. In short,

communication strategies that use the term 'extreme weather' rather than 'climate change' might be necessary to save lives.

Avoiding the term 'climate change' when talking about adaptation carries its own risks, however. Doing so means addressing the symptoms rather than the causes of climate change, a phenomenon also known as agnostic adaptation (Koslov, 2019; Kuh, 2015). Agnostic adaptation can be a harmful strategy because it supports immediate actions but ignores the underlying problems associated with climate change and can constrain future adaptation efforts (Kuh, 2015). For example, adaptation strategies that rely only on solutions such as increasing air conditioning usage -- rather than approaches such as supporting social networks, identifying community cooling centers, planting shade trees, or increasing the reflectivity of outdoor surfaces -- can aggravate climate change and have negative effects on local air quality (IPCC, 2014). Communicators and researchers therefore face a problem: Should they use the term *climate change* when describing adaptation strategies, or should they use *extreme weather*?

To date, research on adaptation behavior and policy support has not provided guidance on the benefits and risks of using these terms. Instead, in some studies the researchers explicitly ask about responses to climate change (e.g., Brügger et al., 2016; Elrick-Barr et al., 2016) whereas in others they ask about responses to extreme weather impacts without mentioning climate change (e.g., Koerth et al., 2013; Valois et al., 2020). Research in the U.S. indicates that slight differences in wording can have significant effects on public attitudes regarding climate change (Hart & Feldman, 2018, 2021; Meerow & Neuner, 2020; Schuldt et al., 2011). However, no study has directly measured differences in adaptation behavior or policy support based on whether they are described as relevant to *extreme weather* or *climate change*.

To help address this gap in the literature, we developed an experimental study measuring Americans' willingness to adopt climate change adaptation behaviors and support adaptation policies based on which term was used to describe them. This study had the following research questions:

RQ1: Does describing adaptation behaviors and policies as relevant to 'climate change' versus 'extreme weather' affect Americans' support for local adaptation policies and their willingness to adopt different adaptation behaviors?

RQ2: How do responses differ by political party?

Methods

Data were collected in July 2021 using the Prolific online platform. This study was approved by the Yale University Institutional Review Board. All data, materials, and analysis code are available on our Open Science Framework (OSF) project page (<https://osf.io/3nxts/>). Detailed methods are provided in the supplemental materials.

Our study design was informed by the model of psychological adaptation to climate change proposed by Reser and Swim (2011; Swim et al., 2009). This model suggests that individuals adapt to climate change as either a proactive or reactive response to climate change impacts (i.e., threats). The relationship between threat and response is mediated by several psychological factors, including interpretation of a specific threat as attributable to climate change (Reser & Swim, 2011, p. 279). Our experimental manipulation occurred at the interpretation step: We presented participants in the two conditions with an identical list of potential hazards and described them as relevant to 'extreme weather' or 'climate change' in our question wording. Our questions focused on proactive behaviors (i.e., preparedness) so that we could ask about general hazards rather than specific events that might not apply to the whole national sample.

We chose 'extreme weather' as the alternative wording because it applies to many of the same impacts, but was not likely to evoke the same associations, as the term 'climate change.' Climate change and extreme weather are related phenomena, but research on public perception of climate risk has found that members of the public often do not connect extreme weather events to climate change unprompted (Howe et al., 2014; Marlon et al., 2021; Ogunbode et al., 2019). We therefore hypothesized that these terms might receive different levels of endorsement for relevant policies and behaviors. Moreover,

because 'extreme weather' comprises many types of events, it is broad enough that it can describe multiple possible impacts linked to climate change (such as fires, floods, and hurricanes) but specific enough that it excludes other natural hazards that are not linked to climate change (such as earthquakes). Therefore, using 'extreme weather' allowed us to make minimal changes in the question wording between the two conditions while also being likely to elicit meaningful and comparable differences in responses.

Our study also investigated whether there are differences by political party in levels of endorsement for adaptation behaviors and policies in the United States. We hypothesized that the terms 'climate change' and 'extreme weather' might prompt different levels of endorsement because 'climate change' is a highly politicized term in the United States (Ballew et al., 2019; Dunlap et al., 2016; Leiserowitz et al., 2021), whereas 'extreme weather' may not be. Americans are politically divided on climate change for numerous reasons, including adherence to group beliefs (Ballew et al., 2020), political elite cues (Mildenberger & Leiserowitz, 2017), and partisan identity sorting on these beliefs and cues (Mason, 2015). Reser & Swim's (2011) model suggests that characteristics of individuals and communities can moderate interpretations of, and responses to, climate change threats. Because one's political party indicates both personal and group beliefs, we hypothesized that political party might moderate the interpretation of climate change threats and influence adaptive responses.

In our survey procedure, after answering questions about baseline preparedness behaviors (Supplemental Table 4) and completing an attention check, respondents were randomly assigned to one of two conditions, where they read a definition of either 'extreme weather' or 'climate change. Respondents in the 'extreme weather' condition received the following definition: "The following questions ask about actions you may have taken to prepare for the impacts of extreme weather. **Extreme weather** refers to unusually severe events including floods, hurricanes, fires, droughts, and extreme heat or cold." Respondents in the 'climate change' condition received the following definition: "The following questions ask about actions you may have taken to prepare for the impacts of climate change. **Climate change** refers to large-scale shifts in weather patterns including floods, hurricanes, fires, droughts, and extreme heat or cold." After reading this definition, respondents then were asked a series of questions

about their willingness to carry out related behaviors and their support for related policies. Respondents in the two groups read the same statements in both conditions, but with either the words 'extreme weather' or 'climate change' (e.g., "How willing or unwilling are you to do the following to prepare for the impacts of [extreme weather/climate change]?"). More details on our experimental manipulation are included in the supplemental methods.

The final sample included 1,558 participants (641 Democrats, 751 Republicans, 120 Independents or members of other political parties, 40 individuals who did not identify with a political party, and 2 who did not answer the question); 781 participants in the 'extreme weather' condition (320 Democrats, 365 Republicans, 69 Independent/Other, 25 None, 2 no answer), and 777 participants in the 'climate change' condition (321 Democrats, 390 Republicans, 51 Independent/Other, 15 None). Political parties included leaners, i.e., participants who identified as Independents but said that they leaned toward one party over another. Detailed information about sample demographics are provided in the supplemental methods and in Supplemental Tables 5-7. Demographics did not significantly differ between the two experimental conditions.

Exploratory factor analyses using oblimin rotation were conducted in SPSS v.28 to reduce the dimensionality of the data (Table 1). Our final analysis includes five dependent variables (DVs): Personal behavior (i.e., willingness to enact household actions to prepare for climate change/extreme weather impacts), Collective behavior (i.e., willingness to help others and participate in political action to prepare for impacts), Protecting infrastructure (i.e., support for protecting infrastructure as a government priority), Protecting natural spaces (i.e., support for protecting natural spaces as a government priority), and Land use regulation (i.e., support for local government regulations to prepare cities for impacts).

Table 1a. Exploratory factor analysis results: Adaptation behaviors

<u>Item Number and Items</u>	<u>Factor loading score</u>	<u>Cronbach's alpha if item deleted</u>
Factor 1: Personal behaviors (standardized $\alpha = 0.82$)		
<i>Stem text: How willing or unwilling are you to do the following to prepare for the impacts of [extreme weather/climate change]? (1-7, 1 = Very unwilling, 4 = Neutral, 7 = Very willing)</i>		
Prepare an emergency supply kit	0.90	0.72
Prepare a home emergency plan that all members of your household know about	0.91	0.71
Purchase a home backup power generator or battery system	0.46	0.83
Look up information about [extreme weather/climate change] impacts that might affect you, such as flood or heat maps	0.54	0.77
Factor 2: Collective behaviors (standardized $\alpha = 0.95$)		
<i>Stem text: How willing or unwilling are you to do each of the following to help your local community prepare for the impacts of [extreme weather/climate change]? (1-7, 1 = Very unwilling, 4 = Neutral, 7 = Very willing)</i>		
Join a local emergency response team such as the Red Cross	0.75	0.94
Attend information sessions about ways to prepare your community for [extreme weather/climate change]	0.81	0.94
Volunteer to talk to your neighbors about how to prepare for the impacts of [extreme weather/climate change]	0.84	0.94
Share information on social media about how to prepare for [extreme weather/climate change]	0.72	0.94
Participate in a community effort to develop a local [extreme weather/climate change] preparedness plan	0.85	0.93
Contact state and local government officials about preparing your community for [extreme weather/climate change]	0.90	0.94
Donate money to a local group working on ways to prepare your community for [extreme weather/climate change]	0.76	0.94
Join a local campaign to convince your state and local government officials to take action to prepare your community for the impacts of [extreme weather/climate change]	0.94	0.93

Table 1b. Exploratory factor analysis results: Adaptation policies

<u>Item Number and Items</u>	<u>Factor loading score</u>	<u>Cronbach's alpha if item deleted</u>
Factor 1: Protecting infrastructure (standardized $\alpha = 0.85$)		
<i>Stem text: In your opinion, how much priority should your state and local governments give to protecting each of the following from the effects of [extreme weather/climate change] over the next 10 years? (1 = Not a priority, 2 = Low priority, 3 = Medium priority, 4 = High priority)</i>		
The electricity system	0.85	0.82
Public water supplies	0.71	0.81
Public sewer systems	0.67	0.82
People's health	0.42	0.83
Transportation/roads/bridges	0.63	0.83
Agriculture	0.41	0.84
Factor 2: Protecting natural spaces (standardized $\alpha = 0.80$)		
Coastlines/Wetlands	0.61	0.75
Forests	0.86	0.68
State and local parks	0.66	0.75
Factor 3: Land use regulation (standardized $\alpha = 0.75$)		
<i>Stem text: How much do you support or oppose the following policies for your local community to help prepare for the impacts of [extreme weather/climate change]? (1 = Strongly oppose, 2 = Somewhat oppose, 3 = Somewhat support, 4 = Strongly support)</i>		
Change zoning rules to reduce new construction in areas at greatest risk from [extreme weather/climate change]	0.68	0.68
Require electric utilities to relocate power lines underground to avoid outages from [extreme weather/ climate change]	0.66	0.69
Promote construction of buildings that are more resistant to damage from [extreme weather/climate change]	0.73	0.66
Plant more trees in your local community	0.41	0.76

Our study also included two additional constructs for exploratory purposes: mitigation policy support and attitudes toward climate change. We found no significant differences between conditions on these questions (see Supplemental Tables 2-3), suggesting that the wording condition had no effect on them.

Regression-based factor scores were calculated based on the exploratory factor analysis' loadings and used in subsequent analyses using R. We calculated Cohen's *d* effect sizes as a metric to assess the differences in mean factor scores between the 'climate change' condition compared with the 'extreme

weather' condition for each of the five dependent variable factors.

Results

Overall, the proportion of Americans who are willing to adopt adaptation behaviors, and support adaptation policies, differed somewhat between the two conditions. We also found that the wording had different effects on support for different types of behaviors and policies.

Figure 1 shows differences in overall factor scores for the five dependent variable factors. Differences in mean ratings for each question item by condition are provided in Supplemental Table 1, and differences in proportions of respondents who endorsed each item by condition are provided in Supplemental Figures 1 to 4.

Figure 1

Standardized mean differences in adaptation behavior willingness and policy support factor scores by wording condition for all respondents (N = 1,558).

Note. Coefficient indicates the effect of being in the 'climate change' condition compared with the 'extreme weather' condition such that negative values mean that people had higher scores in the 'extreme weather' condition than in the 'climate change' condition. Error bars represent 95% confidence intervals.

Respondents in the 'climate change' condition were significantly less willing overall to engage in personal adaptation behaviors than were respondents in the 'extreme weather' condition ($d = -0.24$, 95% CI: -0.34, -0.14). Results differed by political party (Figure 2); willingness was lower only among Republicans ($d = -0.43$, CI: -0.58, -0.28) but not among Democrats ($d = -0.01$, CI: -0.14, 0.12). The coefficient for effect size for Independents/No party was negative but was not statistically significant ($d = -0.27$, CI: -0.62, 0.07). However, we note throughout that Independents/No party had much larger confidence intervals than Democrats or Republicans due to smaller sample size.

Figure 2

Standardized mean differences in adaptation behavior willingness and policy support factor scores by wording condition by political party (Democrat $n = 641$, Independent/No party $n = 160$, Republican $n = 755$).

Note. Coefficient indicates the effect of being in the 'climate change' condition compared with the 'extreme weather' condition such that negative values mean that people had higher scores in the 'extreme weather' condition than in the 'climate change' condition. Inner error bars in the party charts denote 83% confidence intervals and outer error bars represent 95% confidence intervals. The 83% confidence interval error bars facilitate visual identification of differences between effect sizes at the $p = .05$ level (Goldstein & Healy, 1995).

In contrast, there were no significant differences in respondents' overall willingness to engage in collective adaptation behaviors ($d = -0.04$, CI: -0.13, 0.06). Results by political party revealed that

whereas Republicans' willingness to engage in collective behaviors was significantly *lower* in the 'climate change' condition ($d = -0.25$, CI: -0.40, -0.10), Democrats' willingness to engage in these same behaviors was significantly *higher* ($d = 0.22$, CI: 0.07, 0.36). Results for Independents/No party did not show a statistically significant difference by condition ($d = -0.13$, CI: -0.43, 0.17). In both conditions, the proportion of respondents' who were willing to adopt collective behaviors was smaller than the proportion willing to adopt personal behaviors (see Supplemental Figures 1 and 3).

There were mixed effects by condition on overall adaptation policy support. Respondents in the 'climate change' condition were less willing, compared with those in the 'extreme weather' condition, to support protecting infrastructure ($d = -0.31$, CI: -0.41, -0.21) and changing land use regulations ($d = -0.24$, CI: -0.34, -0.14). However, there were no significant differences overall in support for protecting natural spaces ($d = 0.06$, CI: -0.04, 0.16). Notably, in both conditions and across parties, the proportions of respondents who supported both infrastructure and land use regulation were larger than the proportion supporting protecting natural spaces (see Supplemental Figures 2 and 4).

By political party, support for infrastructure protections was lower in the 'climate change' condition among Republicans ($d = -0.47$, CI: -0.64, -0.30), Democrats ($d = -0.12$, CI: -0.22, -0.01), and Independents/No party ($d = -0.26$, CI: -0.51, -0.01), with the effect significantly larger for Republicans than for Democrats. Regarding protecting natural spaces, there were no significant differences in support by condition among Republicans ($d = -0.04$, CI: -0.19, 0.11) or Independents/No party ($d = 0.13$, CI: -0.08, 0.44), but support was higher among Democrats in the 'climate change' condition ($d = 0.16$, CI: 0.03, 0.29). Finally, while Republicans' support for land use regulation was significantly lower in the 'climate change' condition ($d = -0.42$, CI: -0.58, -0.27), there were no significant differences by condition in support among Democrats ($d = 0.00$, CI: -0.11, 0.10) or Independents/No party ($d = -0.24$, CI: -0.57, 0.09).

Discussion

In this study, we conducted an experiment to determine whether describing climate change adaptation behaviors and policies as relevant to 'climate change' versus 'extreme weather' affected

Americans' willingness to endorse those behaviors and policies. We found that effects varied based on both the respondents' political party as well as what kinds of policies and behaviors were being described.

Specifically, we found that using the term 'climate change' resulted in lower support for most adaptation behaviors and policies among Republicans but *higher* support for some behaviors and policies among Democrats. Notably, the only DV where the wording made no difference among Republicans (i.e., support for protecting natural spaces), was the one where Republican support was lowest (see Supplemental Figure 4). These results are consistent with research that has shown that Democrats have more positive attitudes than Republicans toward climate change mitigation policies and behaviors (e.g., Drews & van den Bergh, 2016; Leiserowitz et al., 2021). They are also consistent with research showing that support for adaptation policies varies based on both political ideology (Bateman & O'Connor, 2016; Ray et al., 2017) and the type of policy itself (Ray et al., 2017).

The relationship between political party and adaptation behavioral willingness has not been deeply explored to date. Many studies on adaptation behavior have not reported the effects of political party or ideology (e.g., Koerth et al., 2013; Semenza et al., 2011; Valois et al., 2020), and other research has suggested that party has no significant effect on behavioral intention (Schwaller et al., 2020) or that the effects are indirect via climate change risk perceptions (e.g., van Valkengoed & Steg, 2019b). Moreover, none of these studies have measured differences in adaptation behavioral willingness based on whether the behaviors were described as relevant to *climate change* or *extreme weather*. Our study suggests that for Americans, political party affiliation plays a role in willingness to engage in adaptation behaviors when they are described as relevant to climate change, but not when described as relevant to extreme weather.

Finally, our study finds that mentioning climate change can have a significant *positive* effect on adaptation support among Democrats. Democrats are already more willing than other political groups to engage in personal and collective action to mitigate climate change (Bliuc et al., 2015; Feldman & Hart, 2016; Leiserowitz et al., 2021), but previous studies on individuals' willingness to engage in collective climate change adaptation behaviors have not examined the effects of political party affiliation and

ideology, or the effects of mentioning versus not mentioning climate change (e.g., Koerth et al., 2013; Thaker et al., 2016). Our finding is also consistent with prior qualitative research on agnostic adaptation (Koslov, 2019), which suggests that avoiding the topic of climate change when discussing adaptation means ignoring social and political actions that will be necessary in the longer term (Kuh, 2015).

Our study's limitations include, first, the representativeness of our sample. Although the Prolific platform provided a representative sample of Americans on gender and race (though not ethnicity), the final sample was younger and more educated than the American population overall. Moreover, while our final sample was close to the proportions of Americans identifying with the major political parties after accounting for party leaners (cf. Jones, 2022), our sample size for Independents was too small to draw conclusions about the effects of the experiment on this group. Additionally, the sample also under-represented Hispanics and Latinos, who made up only 6% of the sample but comprise 18% of the U.S. population (U.S. Census Bureau, 2019). Finally, our study may not represent how individuals outside of the United States might respond to these items, since the United States is not representative of the rest of the world on climate attitudes and actions, or on the effects of political ideology on climate attitudes (Lewis et al., 2019; Smith et al., 2017). Furthermore, outside the Global North, focusing on the link between extreme weather events and climate change might distract public attention from more concrete actions to address immediate social vulnerabilities and needs (Lahsen & Ribot, 2021).

Second, 'climate change' and 'extreme weather' are not precisely equivalent wording conditions. Although we described both concepts in terms of the same specific impacts (i.e., floods, hurricanes, fires, droughts, and extreme heat or cold), climate change includes additional impacts, such as changes in seasonality, ocean acidification, and sea level rise (IPCC, 2021), that are not covered in the question wording. We selected these two terms believing that respondents associate different emotions and attitudes with 'climate change' compared with 'extreme weather', but our study did not measure those associations. As a result, our study does not test factors other than political party that may explain why these two terms received different levels of endorsement. Instead, our study's goal was to establish

whether these differences exist in the adaptation communication context. Future research is necessary to better understand why these two terms prompted different responses.

Implications for researchers

This study furthers researchers' understanding of how to measure Americans' willingness to engage in climate change adaptation behaviors and to support adaptation policies. Research to date on adaptation behavior and policy support has measured responses using wording that either relates the behavior or policy directly to climate change (Brügger et al., 2016; Elrick-Barr et al., 2016), or to discrete impacts such as flooding (Koerth et al., 2013; Valois et al., 2020), but has not directly compared how people respond to these different terms. Our study shows that asking about 'climate change', versus 'extreme weather,' prompted different responses on questions about support for the same adaptation behaviors and policies. Thus, whether researchers should use the term 'climate change' in their question wording depends on whether the researchers themselves think climate change is relevant to their study. If a researcher is interested in understanding uptake of adaptation behaviors and support for protective policies regardless of their links to climate change, then 'extreme weather' or related wording may be more appropriate. However, if the researcher thinks that climate change is relevant to the study design (e.g., if climate attitudes might be predictive of these behaviors), then the 'climate change' wording may be more appropriate.

We also encourage future researchers to explore other factors that may affect individuals' responses to 'climate change' versus 'extreme weather' wording. While our study shows that political party is likely an important factor in the United States, these differences by condition could be explained by other factors that affect individuals' interpretation of climate change impacts, including affective responses or personal experiences (Reser & Swim, 2011) associated with each term, and even the types of climate change impacts experienced (Marlon et al., 2021). Recent research from van Valkengoed et al. (2022) also found that attitudes toward climate change are more closely associated with adaptation behaviors and policy support when question wording links a hazard to climate change than when it does not. Moreover, research on adaptation behavior and policy support to date has suggested many possible

factors that may be associated with adaptation actions, including levels of risk perception and self-efficacy, (Grothmann & Patt, 2005; Reser & Swim, 2011; van Valkengoed & Steg, 2019a), social and cultural norms, affective responses (Reser & Swim, 2011; van Valkengoed & Steg, 2019a), psychological coping mechanisms (Grothmann & Patt, 2005; Reser & Swim, 2011), and sense of personal responsibility to act (van Valkengoed & Steg, 2019a). More research is needed to better understand how these factors and their relationships to adaptation behavior and policy support vary depending on the wording used to describe them.

Implications for climate communicators

Our study suggests that there are benefits and risks to directly talking about climate change when talking about climate impacts and potential adaptation responses. These benefits and risks vary depending on who comprises the audience for the adaptation message.

For an audience of Democrats, using the term 'climate change' is not harmful, and, for some behaviors and policies can even be beneficial. We did find a marginal decrease in support for infrastructure protections in the 'climate change' condition, but this did not translate into a meaningful difference in proportions of the population supporting these policies. Notably, we found that Democrats overall were *more* willing to participate in collective behaviors when those behaviors were described as protecting people from climate change rather than extreme weather. This suggests that communicators who are hoping to engage Democrats on climate change adaptation will likely find support for many potential behaviors and policies.

For an audience of Republicans, using the term 'climate change' is riskier. However, there are differences even within Republican audiences based on the types of behaviors and policies described. Nonetheless, Republicans' decreased willingness to carry out personal protective behaviors in the 'climate change' condition is important to note, because these include potentially life-saving actions like having an emergency plan or emergency kit. Therefore, when describing policies, using 'climate change' may be relatively harmless, but when describing behaviors, using 'extreme weather' is more likely to be an effective option, until more Republicans perceive 'climate change' as a serious risk.

Conclusion

Relatively few Americans have taken action to prepare themselves for climate change impacts (Carman et al., 2021), but the current study suggests that most Americans are willing to take these actions. They are also willing to support many local adaptation policies. Our data further suggests that for some, but not all audiences, willingness to take these actions and support these policies is affected by whether the term 'climate change' or 'extreme weather' is used to describe them.

Talking about climate change is important for many reasons beyond promoting the behaviors and policies discussed here, such as establishing a shared understanding of others' level of climate concern (Mildenberger & Tingley, 2019) and promoting acceptance of climate change science (Goldberg et al., 2019). Our study shows that while there are risks to discussing climate change with some audiences, there are important benefits with others. Moreover, our study found that talking about climate change in the context of *adaptation* measures did not negatively affect respondents' support for *mitigation* policy, compared with talking about extreme weather (see Supplemental Figures 5-7; cf. Carrico et al., 2015; Howell et al., 2016). Thus it is important for climate communicators to continue to identify opportunities to talk directly about climate change whenever possible, including when discussing adaptation.

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Supplementary Information for:

Measuring Americans' support for adapting to 'climate change' or 'extreme weather'

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Detailed Methods Information

Study design

Our study design was informed by the model of psychological adaptation to climate change proposed by Reser and Swim (2011; Swim et al., 2009). This model suggests that individuals adapt to climate change as either a proactive or reactive response to climate change impacts (i.e., threats). The relationship between threat and response is mediated by several psychological factors, including interpretation of a specific threat as attributable to climate change (Reser & Swim, 2011, p. 279). Our experimental manipulation occurred at the interpretation step: We presented participants in the two conditions with an identical list of potential hazards and described them as relevant to 'extreme weather' or 'climate change' in our question wording. Our questions focused on proactive behaviors (i.e., preparedness) so that we could ask about general hazards rather than specific events that might not apply to the whole national sample.

We chose 'extreme weather' as the alternative wording because it applies to many of the same impacts, but was not likely to evoke the same associations, as the term 'climate change.' Climate change and extreme weather are related phenomena, but research on public perception of climate risk has found that members of the public often do not connect extreme weather events to climate change on their own (Howe et al., 2014; Marlon et al., 2021; Ogunbode et al., 2019). We therefore hypothesized that these terms might prompt different levels of endorsement for relevant policies and behaviors. Moreover, because 'extreme weather' comprises many types of events, it is broad enough that it can describe multiple possible impacts linked to climate change (such as fires, floods, and hurricanes) but specific enough that it excludes other natural hazards that are not linked to climate change (such as earthquakes). Therefore, using 'extreme weather' allowed us to make minimal changes in the question wording between the two conditions while also being likely to elicit meaningful and comparable differences in responses.

Our study also investigated whether there are differences by political party in levels of endorsement for adaptation behaviors and policies in the United States. We hypothesized that the terms 'climate change' and 'extreme weather' might prompt different levels of endorsement because 'climate

change' is a highly politicized term in the United States (Ballew et al., 2019; Dunlap et al., 2016; Leiserowitz et al., 2021), whereas 'extreme weather' may not be. Americans are politically divided on climate change for numerous reasons, including adherence to group beliefs (Ballew et al., 2020), political elite cues (Mildenberger & Leiserowitz, 2017), and partisan identity sorting on these beliefs and cues (Mason, 2015). Reser & Swim's (2011) model suggests that characteristics of individuals and communities can moderate interpretations of, and responses to, climate change threats. Because one's political party indicates both personal and group beliefs, we hypothesized that political party might moderate the interpretation of climate change threats and influence adaptive responses.

Power and sequential analyses

We used a sequential analysis approach to determine sample size. Sequential analysis helps researchers conduct experiments with high statistical power and substantially greater efficiency (i.e., can reduce the required sample size by 30% or more; Lakens, 2014). The approach is to collect an initial sample, examine the results, and rely on a pre-registered decision rule about whether or not to collect additional data. This approach controls for error rates by lowering the alpha level for each additional decision to collect more data. Based on a smallest effect size of interest (SESOI) set at $d = 0.15$, a power analysis indicated that a total of 699 participants per condition was needed ($\alpha = .05$, power = .80, two-tailed). We were willing to collect up to 699 participants per condition but would choose to stop earlier if a significant effect was detected or if it seemed unlikely that the effect size would be larger than the SESOI.

We pre-registered (<https://osf.io/3nxts/>) a plan to conduct a sequential analysis with two looks (Lakens, 2014); an interim analysis after 500 participants per condition were collected, and a final analysis (if needed) after an additional 199 participants per condition were collected. We controlled the Type 1 error rate with a more conservative alpha level; the alpha boundaries for the interim and the final analyses were calculated using the GroupSeq package in R (Pahl, 2018) and were set at $p < .0355$ and $p < .0145$, respectively.

After an initial round of data collection ($n = 1,021$), we found that Republicans (excluding party leaners) were underrepresented in the overall sample ($n = 163$, 16%). To test for political party differences, we wanted to ensure a roughly equivalent distribution of Democrats and Republicans. Therefore, we collected an additional oversample based on a quota of Republicans only ($n = 574$), for a final sample $N = 1,595$.

Recruitment

Data were collected in July 2021. This study was approved by the Yale Institutional Review Board. All data, materials, and analysis code are available on our Open Science Framework (OSF) project page (OSF link provided in the 'Power and Sequential Analyses' section).

A total of 1,595 American participants were recruited online on the Prolific platform. The initial sample ($n = 1,021$) included quotas for age, race, and gender using the quota sampling option offered on the platform. To collect the Republican oversample, we used the political affiliation pre-screening option offered on the platform to recruit Republicans only, but quota sampling was not used in the oversample. The oversample was more likely to include respondents in the age 30-44 group and less likely to include respondents over 60 than the original sample (see Supplemental Table 7). Twenty-five participants from the combined sample completed less than 80 percent of the questionnaire, and twelve participants failed the attention check question. All of these participants were removed from the final analyses. The median time for completion of the survey was 5.0 minutes.

The final sample included 1,558 participants (641 Democrats, 751 Republicans, 120 Independents or members of other political parties, 40 individuals who did not identify with a political party, and 2 who did not answer the question); 781 participants in the "extreme weather" condition (320 Democrats, 365 Republicans, 69 Independent/Other, 25 None, 2 No response), and 777 participants in the "climate change" condition (321 Democrats, 390 Republicans, 51 Independent/Other, 15 None). The sample included 286 participants who initially described themselves as "Independent" or having "Other" political affiliation (139 in the "extreme weather" condition, 147 in the "climate change" condition). These participants were then asked if they were closer to the Republican or the Democratic party, or neither. If

they reported that they were closer to the Democratic [Republican] party (i.e., a party leaner), they were categorized with that party in the analysis.

The sample was 49% female, had a mean age of 42.3 (median = 40, $SD = 15.37$), 1% did not graduate high school, 12% graduated high school, 27% had some college education or an associate's degree, 35% had a Bachelor's degree, and 25% had a graduate or professional degree. Seventy-two percent of participants identified as white, 6% as Hispanic or Latino, 13% as Black, 6% as Asian or Pacific Islander, and 3% identified as another race or ethnicity, including two or more races. Fifty-six percent of respondents said they owned their home, 35% said they were renters, 7% said they occupied their home without payment of rent, and 2% described their homeownership status as "other."

Demographics did not significantly differ between the two experimental conditions (see Supplemental Table 5).

Measures

At the beginning of the survey, all respondents were asked three baseline behavior questions regarding personal actions to prepare for natural disasters, to ensure that the two groups were equivalent on pre-existing likelihood to carry out preparedness behaviors. These questions were drawn from the *Climate Change in the American Mind* (Leiserowitz et al., 2021) study's questions on Americans' adaptation behaviors (Carman et al., 2021). Responses to these questions did not significantly differ between the two experimental conditions (see Supplemental Table 4).

Respondents were then randomly assigned to one of two conditions, where they read a definition of either 'extreme weather' or 'climate change,' and then asked a series of questions about their willingness to carry out related behaviors and support for related policies. Respondents in the 'extreme weather' condition received the following definition: "The following questions ask about actions you may have taken to prepare for the impacts of extreme weather. Extreme weather refers to unusually severe events including floods, hurricanes, fires, droughts, and extreme heat or cold." For behaviors, respondents read statements before each group of questions that described these behaviors as relevant to extreme weather, such as, "How willing or unwilling are you to do the following to prepare for the impacts of

extreme weather?” For policies, they read similar statements such as, “How much do you support or oppose the following policies for your local community to help prepare for the impacts of extreme weather?” Respondents in the ‘climate change’ condition received the following definition: “The following questions ask about actions you may have taken to prepare for the impacts of climate change. Climate change refers to large-scale shifts in weather patterns including floods, hurricanes, fires, droughts, and extreme heat or cold.” Respondents in this group read the same statements as those in the ‘extreme weather’ condition, but with the words ‘extreme weather’ replaced with ‘climate change.’

We note that our definition of ‘climate change’ did not include explicit attribution information stating that climate change *causes* these changes in weather patterns, or that climate change is caused by human activities. We made this decision to maintain identical wording as much as possible between the two conditions.

Respondents in both conditions answered questions related to four dependent variables: personal protective adaptation behaviors (i.e., willingness to enact household actions to prepare for climate change/extreme weather impacts on a 1-7 scale), non-political collective adaptation behaviors (i.e., willingness to help others prepare for climate change/extreme weather impacts on a 1-7 scale), political adaptation behaviors (i.e., willingness to participate in political action to help communities prepare for climate change/extreme weather impacts on a 1-7 scale), and adaptation policy support (i.e., support for local government action to prepare for climate change/extreme weather impacts on a 1-4 scale). Question items were phrased to refer to *preparedness* for impacts rather than *adaptation* since the term *adaptation* can prompt mental associations with unrelated topics such as technology development or general biology (Bruine de Bruin et al., 2021; Meerow & Neuner, 2020).

The personal protective behaviors included four items; the non-political collective behaviors included five items; and the political behaviors included three items. The policy support section included two blocks of questions: one set of nine items asking whether state and local government should prioritize protections for various local resources and infrastructure (1 = Not a priority at all, 4 = High priority), and one set of four items asking levels of support for hypothetical changes to local policy (1 = Strongly

oppose, 4 = Strongly support). Each block of items was presented to respondents on a separate screen, and the individual items were randomized within each block. The behavior items were modified from existing questions used in other studies (Carman et al., 2021; Koerth et al., 2013; van Valkengoed et al., 2021). The policy items included some items drawn from existing studies (Leiserowitz et al., 2021), and some new items that have been recommended for uptake in adaptation planning (Stults & Woodruff, 2017).

Our study included two additional constructs that were included for exploratory purposes but not central to the study: mitigation policy support and attitudes toward climate change. Local mitigation policy support included items related to local mitigation policies: requiring local electric utilities to produce more electricity from renewable energy sources, providing funding for home energy efficiency upgrades, and installing bike lanes. These questions were also drawn from past studies (Leiserowitz et al., 2021). For these questions, we described the policies in terms of 'climate change' in both conditions, so we could test whether introducing the topic of climate change in the 'extreme weather' group would have negative effects. We then asked respondents six questions about their attitudes toward climate change drawn from previous studies (e.g., Chryst et al., 2018), including their perceptions that climate change is happening, that it is caused by human activities, that it will harm them personally, that it will harm future generations, that climate change is personally important, and that they are worried about it. These questions were asked after all of the DV questions to ensure that asking about climate change did not influence responses in the 'extreme weather' condition due to question order effects (Haugtvedt & Liu, 2010). We found no significant differences between conditions on these questions (see Supplemental Table 3), suggesting that the wording condition had no effect on climate attitudes or mitigation policy support.

Finally, participants were asked a series of demographic questions (i.e., gender, age, education, homeownership status, ethnicity/race). This also included a series of political party affiliation questions: Republicans [Democrats] in this study include those who self-identify as Republican [Democrat] and

those who self-identify as Independent but indicate they are closer to the Republican [Democratic] party (i.e., leaners).

Analysis

Exploratory factor analyses using oblimin rotation were conducted in SPSS v.28 for the behavior items and for the policy items to reduce the dimensionality of the data. In this factor analysis, we found that two of the DVs hypothesized in the pre-registration, political and non-political collective action, did not load as separate factors. Furthermore, we found that the policies, which were pre-registered as one DV, loaded in three distinct factors: items related to protecting physical infrastructure, items related to protecting natural spaces, and items related to land use regulation. Therefore, our final analysis includes five DVs: Personal behavior (i.e., willingness to enact household actions to prepare for climate change/extreme weather impacts), Collective behavior (i.e., willingness to help others and participate in political action to prepare for impacts), Protecting infrastructure (i.e., support for protecting infrastructure as a government priority), Protecting natural spaces (i.e., support for protecting natural spaces as a government priority), and Land use regulation (i.e., support for local government regulations to prepare cities for impacts).

Regression-based factor scores were calculated based on the exploratory factor analysis' loadings and used in subsequent analyses using R. We calculated Cohen's d effect sizes as a metric to assess the differences between the 'climate change' condition compared with the 'extreme weather' condition for each of the five factors.

Supplemental Tables

Supplemental Table 1. Descriptive statistics for dependent variables items by condition

Question text	Range	Extreme weather (n = 781)		Climate change (n = 777)	
		Mean	SD	Mean	SD
Factor: Personal adaptation behaviors					
Prepare an emergency supply kit	1-7	6.01	1.19	5.69	1.51
Prepare a home emergency plan that all members of your household know about	1-7	5.79	1.32	5.49	1.62
Purchase a home backup power generator or battery system	1-7	4.87	1.85	4.90	1.78
Look up information about [extreme weather/climate change] impacts that might affect you, such as flood or heat maps	1-7	5.76	1.39	5.22	1.77
Factor: Collective adaptation behaviors					
Join a local emergency response team such as the Red Cross	1-7	3.60	1.90	3.63	1.83
Attend information sessions about ways to prepare your community for [extreme weather/climate change]	1-7	4.09	1.89	3.98	1.98
Volunteer to talk to your neighbors about how to prepare for the impacts of [extreme weather/climate change]	1-7	3.50	1.95	3.34	1.97
Share information on social media about how to prepare for [extreme weather/climate change]	1-7	4.31	2.05	4.02	2.14
Participate in a community effort to develop a local [extreme weather/climate change] preparedness plan	1-7	3.93	1.85	3.85	1.97
Contact state and local government officials about preparing your community for [extreme weather/climate change]	1-7	3.56	1.97	3.61	2.05
Donate money to a local group working on ways to prepare your community for [extreme weather/climate change]	1-7	3.73	1.96	3.68	2.11
Join a local campaign to convince your state and local government officials to take action to prepare your community for the impacts of [extreme weather/climate change]	1-7	3.52	1.94	3.55	2.05
Factor: Priority of infrastructure protections (Adaptation policy support)					
The electricity system	1-4	3.70	0.56	3.50	0.78
Public water supplies	1-4	3.77	0.50	3.61	0.75
Public sewer systems	1-4	3.44	0.70	3.28	0.83
People's health	1-4	3.71	0.59	3.54	0.80
Transportation/roads/bridges	1-4	3.57	0.61	3.29	0.82
Agriculture	1-4	3.44	0.69	3.39	0.83
Factor: Priority of protecting natural spaces (Adaptation policy support)					
Coastlines/Wetlands	1-4	3.11	0.83	3.10	0.92
Forests	1-4	3.10	0.80	3.18	0.86
State and local parks	1-4	2.81	0.84	2.83	0.89
Factor: Local land use regulation (Adaptation policy support)					

Change zoning rules to reduce new construction in areas at greatest risk from [extreme weather/climate change]	1-4	3.26	0.74	3.15	0.89
Require electric utilities to relocate power lines underground to avoid outages from [extreme weather/climate change]	1-4	3.43	0.67	3.26	0.80
Promote construction of buildings that are more resistant to damage from [extreme weather/climate change]	1-4	3.54	0.62	3.32	0.81
Plant more trees in your local community	1-4	3.55	0.64	3.60	0.66

Supplemental Table 2. Support for local climate change mitigation policies by condition

<u>Question text</u>	<u>Range</u>	<u>Extreme weather</u> <u>(n = 781)</u>		<u>Climate change</u> <u>(n = 777)</u>	
		<u>Mean</u>	<u>SD</u>	<u>Mean</u>	<u>SD</u>
Require your local utility to produce more electricity from renewable energy sources, like wind or solar.	1-4	3.27	0.90	3.26	0.91
Provide funding to help homeowners make energy-efficiency improvements to their homes (such as replacing old, inefficient furnaces, water heaters, air conditioners, and insulation).	1-4	3.36	0.78	3.34	0.83
Construct bike paths and installing bike lanes on city streets.	1-4	3.14	0.87	3.19	0.85
Increase the availability of public transportation in your county.	1-4	3.25	0.84	3.20	0.89
Change your county's zoning rules to promote the construction of more energy-efficient buildings	1-4	3.21	0.83	3.22	0.86

Supplemental Table 3. Climate change attitudes by condition

<u>Question text</u>	<u>Range</u>	<u>Extreme weather</u> <u>(n = 781)</u>		<u>Climate change</u> <u>(n = 777)</u>	
		<u>Mean</u>	<u>SD</u>	<u>Mean</u>	<u>SD</u>
On a scale from 1 to 7, how strongly do you believe that climate change is or is not happening? (1 = Strongly believe climate change is NOT happening, 7 = Strongly believe climate change IS happening)	1-7	5.79	1.67	5.71	1.68
Assuming climate change IS happening: How much of it do you believe is caused by human activities, natural changes in the environment, or some combination of both? (1 = Entirely by natural changes in the environment, 7 = Entirely by human activities)	1-7	4.96	1.67	4.97	1.64
How worried are you about climate change? (1 = Not at all worried, 4 = Very worried)	1-4	2.94	0.95	2.96	0.96
How much do you think climate change will harm you personally? (0 = Don't know, 1 = Not at all, 4 = A great deal)	0-4	2.43	1.06	2.44	1.03
How much do you think climate change will harm future generations of people? (0 = Don't know, 1 = Not at all, 4 = A great deal)	0-4	3.16	1.11	3.16	1.11
How important is the issue of climate change to you personally? (1 = Not at all important, 5 = Extremely important)	1-5	3.39	1.22	3.42	1.21

Supplemental Table 4. Baseline behaviors by condition

<u>Question text</u>	<u>Final sample</u> (<i>N</i> = 1,558)	<u>Extreme</u> <u>weather</u> (<i>n</i> = 781)	<u>Climate</u> <u>change</u> (<i>n</i> = 777)
<u>Have thought about preparing for a natural disaster</u>			
Not at all	11.9%	11.3%	12.5%
A little	33.4%	34.1%	32.8%
Some	38.6%	39.1%	38.1%
A great deal	16.1%	15.6%	16.6%
<u>Have a home emergency kit</u>			
Yes	28.6%	26.4%	30.8%
No	71.4%	73.6%	69.2%
<u>Have a home emergency preparedness plan that all members of your family know about</u>			
Yes	45.8%	43.7%	48.0%
No	54.2%	56.3%	52.0%

Supplemental Table 5. Sample demographics by condition

	<u>Final sample</u> <u>(N = 1,558)</u>	<u>Extreme</u> <u>weather</u> <u>(n = 781)</u>	<u>Climate</u> <u>change</u> <u>(n = 777)</u>
<u>Gender</u>			
Woman	48.6%	48.8%	48.4%
Man	50.8%	50.3%	51.2%
Another gender identity	0.6%	0.9%	0.4%
<u>Age category</u>			
18-24	13.1%	13.7%	12.5%
25-34	25.5%	25.4%	25.6%
35-44	20.5%	20.7%	20.2%
45-54	15.0%	16.4%	13.5%
55-64	15.9%	13.4%	18.3%
65 or older	10.1%	10.4%	9.9%
<u>Race or ethnicity</u>			
Hispanic or Latino, any race	5.8%	6.7%	5.0%
White, not Hispanic or Latino	72.5%	70.9%	74.1%
Black or African American, not Hispanic or Latino	13.1%	14.2%	12.0%
Asian or Pacific Islander, not Hispanic or Latino	5.7%	5.1%	6.2%
Other, including multiple racial identities	2.9%	3.1%	2.7%
<u>Education</u>			
Did not graduate high school	0.8%	0.8%	0.9%
High school or equivalent	11.8%	12.8%	10.7%
Some college or associate's degree	27.2%	27.5%	26.8%
Bachelor's degree or equivalent	34.9%	34.3%	35.6%
Graduate or professional degree	25.3%	24.6%	26.0%
<u>Home ownership status</u>			
Own	55.5%	54.4%	56.6%
Rent	35.5%	36.0%	35.0%
Occupy without payment of rent	7.4%	8.2%	6.7%
Other	1.5%	1.4%	1.7%
<u>Region</u>			
Northeast	18.5%	17.2%	19.8%
South (includes Texas)	40.5%	42.1%	38.9%
Midwest	18.8%	19.4%	18.3%
West	21.8%	21.0%	22.6%
Other	0.4%	0.4%	0.4%

Supplemental Table 6. Demographics by political party*

	<u>Republicans</u> (<i>n</i> = 755)	<u>Democrats</u> (<i>n</i> = 641)	<u>Independen</u> <u>t/ Other</u> (<i>n</i> = 120)	<u>No party/Not</u> <u>interested in</u> <u>politics</u> (<i>n</i> = 40)
<u>Gender</u>				
Woman	45.7%	53.7%	37.5%	47.5%
Man	54.7%	44.7%	62.5%	52.5%
Another gender identity	--	1.6%	--	--
<u>Age category</u>				
18-24	11.4%	13.6%	15.0%	32.5%
25-34	30.2%	21.4%	20.0%	20.0%
35-44	20.9%	20.3%	20.0%	17.5%
45-54	15.4%	14.0%	18.3%	10.0%
55-64	14.0%	18.3%	15.8%	12.5%
65 or older	8.1%	12.5%	10.8%	7.5%
<u>Race or ethnicity</u>				
Hispanic or Latino, any race	5.7%	5.8%	6.7%	7.5%
White, not Hispanic or Latino	77.5%	67.4%	74.2%	55.0%
Black or African American, not Hispanic or Latino	11.7%	15.9%	6.7%	15.0%
Asian or Pacific Islander, not Hispanic or Latino	3.3%	8.0%	5.8%	12.5%
Other, including multiple racial identities	1.9%	3.0%	6.7%	10.0%
<u>Education</u>				
Did not graduate high school	0.8%	0.5%	0.8%	7.5%
High school or equivalent	13.7%	8.3%	16.7%	17.5%
Some college or associate's degree	24.0%	30.4%	22.5%	47.5%
Bachelor's degree or equivalent	35.8%	34.8%	35.0%	20.0%
Graduate or professional degree	25.7%	26.1%	25.0%	7.5%
<u>Home ownership status</u>				
Own	60.1%	52.3%	48.3%	40.0%
Rent	33.2%	37.4%	39.2%	37.5%
Occupy without payment of rent	5.3%	8.6%	10.8%	20.0%
Other	1.3%	1.7%	1.7%	2.5%
<u>Region</u>				
Northeast	16.0%	22.8%	14.2%	10.0%
South (includes Texas)	44.0%	37.0%	36.7%	42.5%
Midwest	19.2%	18.9%	16.7%	15.1%
West	20.0%	21.3%	32.5%	32.5%
Other	0.8%	--	--	--

* Excludes two respondents who did not answer the political affiliation question

Supplemental Table 7. Demographics of original sample (first look) and final sample compared with U.S. American Community Survey (2019 1-year estimates)

	<u>Original sample</u> (<i>n</i> = 1,001)	<u>Final sample</u> (<i>N</i> = 1,558)	<u>U.S. general population</u> (ACS)
<u>Gender</u>			
Woman	50.1%	48.6%	50.2%
Man	48.9%	50.8%	49.2%
Another gender identity	1.0%	0.6%	na
<u>Age category</u>			
18-24	13.3%	13.1%	12.0%
25-34	19.2%	25.5%	17.9%
35-44	18.7%	20.5%	16.5%
45-54	15.6%	15.0%	15.9%
55-64	20.0%	15.9%	16.6%
65 or older	13.3%	10.1%	21.2%
<u>Race or ethnicity</u>			
Hispanic or Latino, any race	5.4%	5.8%	18.0%
White, not Hispanic or Latino	72.1%	72.5%	60.7%
Black or African American, not Hispanic or Latino	12.5%	13.1%	12.3%
Asian or Pacific Islander, not Hispanic or Latino	6.6%	5.7%	5.7%
Other, including multiple racial identities	3.4%	2.9%	3.3%
<u>Education*</u>			
Did not graduate high school	1.1%	0.8%	11.4%
High school or equivalent	11.0%	11.8%	26.9%
Some college or associate's degree	30.3%	27.2%	28.6%
Bachelor's degree or equivalent	34.6%	34.9%	20.3%
Graduate or professional degree	23.0%	25.3%	12.8%
<u>Home ownership status</u>			
Own	54.4%	55.5%	64.1%
Rent	35.8%	35.5%	35.9%
Occupy without payment of rent	7.9%	7.4%	na
Other	1.9%	1.5%	na
<u>Region</u>			
Northeast	19.6%	18.5%	17.4%
South (includes Texas)	38.5%	40.5%	38.0%
Midwest	19.7%	18.8%	20.8%
West	22.1%	21.8%	23.9%
Other	--	0.4%	na
<u>Political party affiliation (including leaners)</u>			
Republicans	22.1%	48.5%	na
Democrats	62.8%	41.2%	na
Non-leaning Independents	11.5%	7.7%	na
No party/Not interested	3.5%	2.6%	na
No response	0.1%	0.1%	na

na = Not assessed

*Note that educational attainment in our survey is reported for all respondents ages 18 and older, while the American Community survey reports educational attainment only for ages 25 and older.

Supplemental Table 8. Exploratory factor analysis results: Local mitigation policies

<u>Item Number and Items</u>	<u>Factor loading score</u>	<u>Cronbach's alpha if item deleted</u>
<i>Stem text: Reducing the causes of climate change requires cutting down on the use of fossil fuels (such as coal, oil, and gas) from power plants and motor vehicles. How much do you support or oppose the following policies for your local community to help reduce the causes of climate change? (1 = Strongly oppose, 2 = Somewhat oppose, 3 = Somewhat support, 4 = Strongly support)</i>		
Factor: Local mitigation policies (standardized $\alpha = 0.86$)		
Require your local utility to produce more electricity from renewable energy sources, like wind or solar.	0.83	0.82
Provide funding to help homeowners make energy-efficiency improvements to their homes (such as replacing old, inefficient furnaces, water heaters, air conditioners, and insulation).	0.76	0.83
Construct bike paths and installing bike lanes on city streets.	0.65	0.85
Increase the availability of public transportation in your county.	0.69	0.84
Change your county's zoning rules to promote the construction of more energy-efficient buildings	0.81	0.82

Supplemental Figures

Supplemental Figure 1. Proportions of all respondents ($N = 1,558$) who said they are willing (5-7 on a 1-7 scale) to carry out adaptation behaviors in each wording condition. A-D are personal adaptation behaviors and E-L are collective adaptation behaviors. Error bars denote the 95% confidence intervals.

Supplemental Figure 2. Proportions of respondents who support local adaptation policies by wording condition for all respondents ($N = 1,558$). A-F are those rating infrastructure protections a high priority for state and local governments (4 on a 1-4 scale), G-I are high priority of natural space protections (4 on a 1-4 scale), and J-M are support for local land use regulations (3-4 on a 1-4 scale). Error bars denote the 95% confidence intervals.

Supplemental Figure 3. Proportions of respondents who said they are willing (5-7 on a 1-7 scale) to carry out adaptation behaviors by wording condition and political party (Democrat $n = 641$, Independent/No party $n = 160$, Republican $n = 755$). A-D are personal adaptation behaviors and E-L are collective adaptation behaviors. The category name 'EW' denotes the 'extreme weather' condition, and 'CC' denotes the 'climate change' condition. Error bars denote the 95% confidence intervals.

Supplemental Figure 4. Proportions of respondents who support local adaptation policies by wording condition and political party (Democrat $n = 641$, Independent/No party $n = 160$, Republican $n = 755$). A-F are those rating infrastructure protections a high priority for state and local governments (4 on a 1-4 scale), G-I are high priority of natural space protections (4 on a 1-4 scale), and J-M are support for local land use regulations (3 to 4 on a 1-4 scale). The category name 'EW' denotes the 'extreme weather' condition, and 'CC' denotes the 'climate change' condition. Error bars denote the 95% confidence intervals.

Supplemental Figure 5. Standardized mean differences in mitigation policy support factor scores by wording condition for (A) all respondents ($N = 1,558$) and (B) respondents by political party (Democrat $n = 641$, Independent/No party $n = 160$, Republican $n = 755$). Coefficient indicates the effect of being in the 'climate change' condition compared with the 'extreme weather' condition such that negative values mean that people had higher scores in the 'extreme weather' condition than in the 'climate change' condition. Inner error bars in the party charts denote 83% confidence intervals and outer error bars represent 95% confidence intervals. The 83% confidence interval error bars facilitate visual identification of differences between effect sizes at the $p = .05$ level (Goldstein & Healy, 1995).

Supplemental Figure 6. Proportions of respondents who support local mitigation policies (3-4 on a 1-4 scale) by wording condition for all respondents ($N = 1,558$). Error bars denote the 95% confidence intervals.

Supplemental Figure 7. Proportions of respondents who support local mitigation policies (3-4 on a 1-4 scale) by wording condition and political party (Democrat $n = 641$, Independent/No party $n = 160$, Republican $n = 755$). The category name 'EW' denotes the 'extreme weather' condition, and 'CC' denotes the 'climate change' condition. Error bars denote the 95% confidence intervals.